

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

## Social Elements Discipline Report Addendum and Errata



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

**Social Elements  
Discipline Report  
Addendum and Errata**



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**

May 2011



# Contents

**Acronyms and Abbreviations..... vii**

**Introduction ..... 1**

    What is the purpose of this addendum? ..... 1

    What key issues were identified in the public and agency comments on the SDEIS? ..... 1

    What are the key points of this addendum?..... 2

    What is the SR 520, I-5 to Medina: Bridge Replacement and HOV Project? ..... 4

    What is the Preferred Alternative? ..... 4

    When will the project be built?..... 10

    Are pontoons being constructed as part of this project?..... 10

**Affected Environment..... 11**

    Have there been any changes to the affected environment since the SDEIS? ..... 11

    How has the community been involved in the project since the SDEIS? ..... 11

**Potential Effects..... 12**

    How would construction of the project affect social elements? ..... 12

    How would operation of the project affect social elements? ..... 40

**Mitigation..... 54**

    What has been done to avoid or minimize negative effects on social elements? ..... 54

    What would be done to mitigate negative effects that could not be avoided or minimized? ..... 55

**References ..... 57**

## Attachments

- 1 Errata

## List of Exhibits

- 1 Neighborhoods Affected by Construction Activities of the Preferred Alternative (Update to Exhibit 1 of the 2009 Discipline Report)
- 2 Preferred Alternative Project Elements
- 3 Preferred Alternative and Comparison to SDEIS Options
- 4 Preferred Alternative Construction Stages and Durations
- 5 Proposed Haul Routes, Detour Routes, and Construction Staging Areas
- 6 Noise Levels for Typical Construction Phases
- 7 Sound Levels and Relative Loudness of Typical Noise Sources
- 8 Typical Maximum Pile-Driving Noise Levels Assuming 105 dBA at 50 Feet



- 9 Construction within the I-5 and Portage Bay areas
- 10 Eastlake Neighborhood Daily Truck Trips on Potential Haul Routes
- 11 Pile-Driving for the Portage Bay Work Bridges
- 12 Portage Bay/Roanoke Neighborhood Daily Truck Trips on Potential Haul Routes
- 13 Construction within the Montlake area
- 14 Montlake Neighborhood Daily Truck Trips on Proposed Haul Routes
- 15 Construction within the West Approach area
- 16 Pile-Driving for the West Approach area and Union Bay Work Bridges
- 17 Pile-Driving for the East Approach area
- 18 Relocation Effects
- 19 Potential Lid at Montlake Boulevard Interchange (Update to Exhibit 21 of the 2009 Discipline Report)
- 20 Enhanced Bicycle/Pedestrian Crossing at I-5/East Roanoke and Conceptual Lid at 10th and Delmar (Update to Exhibit 22 of the 2009 Discipline Report)
- 21 Number of Residences Where Noise Levels Would Exceed the NAC (Update to Exhibit 23 of the 2009 Discipline Report)
- 22 Permanent Acquisition Effects on Parks (acres) (Update to Exhibit 24 of the 2009 Discipline Report)



# Acronyms and Abbreviations

APE	Area of Potential Effect
BMP	best management practice
CCMP	community construction management plan
dba	A-weighted decibels
ESSB	Engrossed Substitute Senate Bill
Final EIS	Final Environmental Impact Statement
FHWA	Federal Highway Administration
HOV	high-occupancy vehicle
MOHAI	Museum of History and Industry
NAC	noise abatement criteria
NOAA	National Oceanic and Atmospheric Administration
SDEIS	Supplemental Draft Environmental Impact Statement
SDOT	Seattle Department of Transportation
SR	State Route
TOPS	The Option Program at Seward (School)
UW	University of Washington
WAC	University of Washington Waterfront Activities Center
WSDOT	Washington State Department of Transportation







# Introduction

## What is the purpose of this addendum?

This addendum to the State Route (SR) 520, I-5 to Medina: Bridge Replacement and High-Occupancy Vehicle (HOV) Project Social Elements Discipline Report (Washington State Department of Transportation [WSDOT] 2009a) presents the environmental consequences of the Preferred Alternative for the SR 520, I-5 to Medina: Bridge Replacement and HOV Project; compares its effects to design options A, K, and L discussed in the Supplemental Draft Environmental Impact Statement (SDEIS) for the project (WSDOT 2010); and summarizes 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 Social Elements Discipline Report is still pertinent to the Preferred Alternative and its effects, except where this addendum specifically updates it. Text updated to reflect the Preferred Alternative has been cross-referenced using the page numbers within the 2009 Social Elements Discipline Report. Where an addendum exhibit updates or adds new data and/or different potential effects to an exhibit contained in the 2009 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 social elements 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 Social Elements Discipline Report that do not constitute new findings or analysis.

## What key issues were identified in the public and agency comments on the SDEIS?

Key concerns identified in public comments and addressed in this addendum include:

- Short- and long-term effects of project construction and operation on adjacent neighborhoods
- Mitigation measures and processes for neighborhoods
- Maintaining access to businesses and recreation facilities during construction
- Avoiding and/or mitigating the removal of vegetation including “unmaintained” areas as well as street trees and buffers
- Designing lids to ensure an improvement to neighborhood connectivity
- Avoiding or minimizing effects on utilities and emergency services



A number of comments were received on various other elements such as noise, property values, visual quality, traffic, and air quality. These issues are addressed in greater detail in the addenda to the Noise; Land Use, Economics, and Relocations; Visual Quality and Aesthetics; and Air Quality discipline reports (WSDOT 2011c, d, e, f), and in the Final Transportation Discipline Report (WSDOT 2011g).

The errata sheet in Attachment 1 presents revisions to the 2009 Social Elements Discipline Report that respond to the public and agency comments. Where comments required more analysis, that analysis is presented in this addendum.

## What are the key points of this addendum?

The primary effects on social elements related to the Preferred Alternative are similar to those of Option A and are summarized in the bullets below.

### Effects During Construction

- Residents in the study area and people who use the recreational facilities that are near construction activities may be affected by increased noise and dust levels, degraded visual quality, and increased traffic congestion. For some people, these effects could last up to 6 years, depending on their location relative to construction activities. Exhibit 1 provides information on the neighborhoods that would be affected by project construction.
- Residents adjacent to proposed detour routes, staging areas, and haul routes may also experience increased noise and dust and visual quality effects. Haul routes through neighborhoods could result in negative effects related to noise, dust, and traffic congestion on the adjacent land uses and on individual neighborhoods. Local jurisdictions can limit the use of non-arterial streets for truck traffic, and will determine final haul routes for those actions and activities that require a street use or other jurisdictional permit.
- As with the SDEIS options, residents closest to the pile-driving activities would experience the highest levels of noise from construction. Although actual noise levels would vary, depending on the distance and topographical conditions between the pile-driving location and the receiver location, residents up to 1,000 feet or more from the activities may be affected. Pile-driving may be limited to daytime hours to minimize effects on neighborhoods and meet the requirements of local noise ordinances.

### Effects During Operation

- The Preferred Alternative would displace three single-family residences, one residential duplex, and one civic facility (Museum of History and Industry [MOHAI]). The Preferred Alternative would not remove buildings at National Oceanic and Atmospheric Administration (NOAA) Fisheries Science Center nor the Montlake 76 station, as SDEIS Option A would.



Exhibit 1. Neighborhoods Affected by Construction Activities of the Preferred Alternative (Update to Exhibit 1 of the 2009 Discipline Report)

Project Element	Affected Neighborhood							
	Eastlake	Portage Bay/ Roanoke	North Capitol Hill	Montlake	University District	Madison Park	Laurelhurst	Medina
I-5 and SR 520 interchange	•	•	•					
10th Avenue East/Delmar Drive East lid	•	•	•					
Portage Bay Bridge		•		•				
Montlake Boulevard East interchange and lid		•		•				
New bascule bridge		•		•	•			
West approach				•		•	•	
East approach bridge, east abutment, and bridge maintenance facility								•
Floating bridge (includes towing, outfitting, and installing pontoons)				•		•	•	•

- The Preferred Alternative would include the 10th Avenue East/ Delmar Drive East lid and a larger Montlake Boulevard/ 24th Avenue lid. These lids would help reconnect communities north and south of SR 520, and would provide space for walking, biking, and community gatherings. Instead of the lid over I-5, the project would include an enhanced bicycle/pedestrian crossing adjacent to the existing Roanoke Street Bridge. The addition of lids would result in lower noise levels in many locations.
- The Preferred Alternative design includes 4-foot tall concrete traffic barriers, with noise-absorptive material on the traffic barriers and around the lid portals. Additionally, posted speeds between I-5 and the Montlake lid would be reduced to 45 miles per hour. These measures, coupled with design features such as a higher profile in the west approach would collectively reduce noise levels throughout the corridor. These measures were incorporated into the design 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 reasonability criteria. By reducing noise levels, the design refinements of the Preferred Alternative reduce the number of recommended noise walls compared to the SDEIS options (see the Noise Discipline Report Addendum and Errata, WSDOT 2011c).



- The Preferred Alternative would not displace affordable housing or community services, nor would it create any physical impediments that would make it more difficult for residents to access these services.
- During project operation, the Preferred Alternative would not change the delivery of public services within the study area or create the need for additional public services. The project would improve response and travel times for fire, emergency medical, police, and other public service provider vehicles through the project corridor.
- The Preferred Alternative would not result in any negative effects on utilities. The exact locations of all known utilities will be confirmed during the final design to determine the need for relocating and protecting utilities.
- The Preferred Alternative would not result in negative effects for most of the community services in the study area. The Preferred Alternative would result in the permanent acquisition of approximately 6.3 acres of recreational facilities, which is less than any of the SDEIS options. The loss of parkland would be fully mitigated.
- The proposed project would provide a continuous pedestrian and bicycle pathway across Lake Washington, creating more connections for these users.
- The improvements associated with adding the HOV lanes and the reversible HOV access to I-5 would improve transit travel times, access, and safety for transit users, as well as for vanpools and carpools.

## 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 a median planning 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 2 highlights the major components of the Preferred Alternative.

The Preferred Alternative would include the following elements:

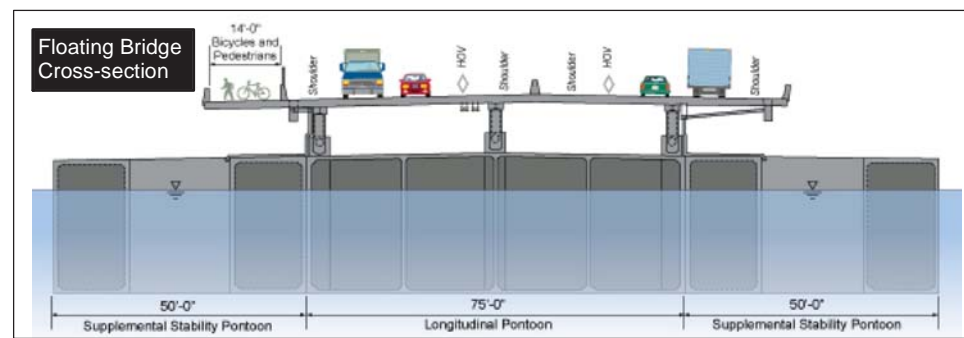
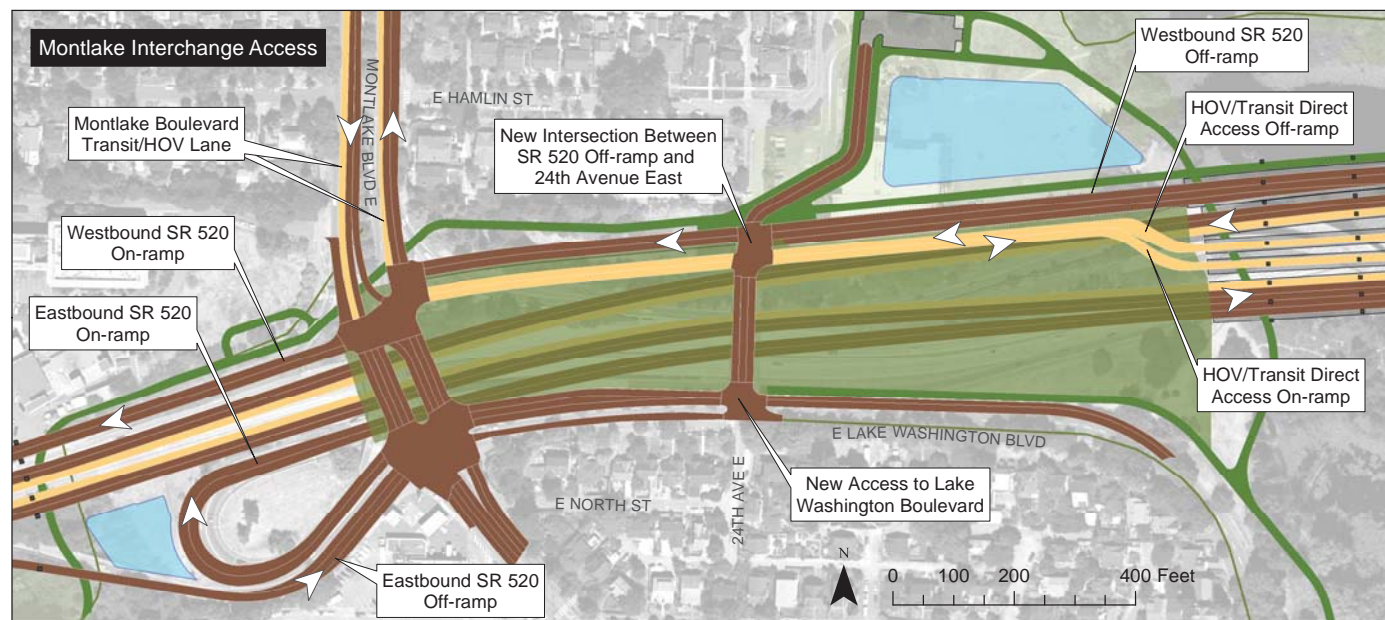
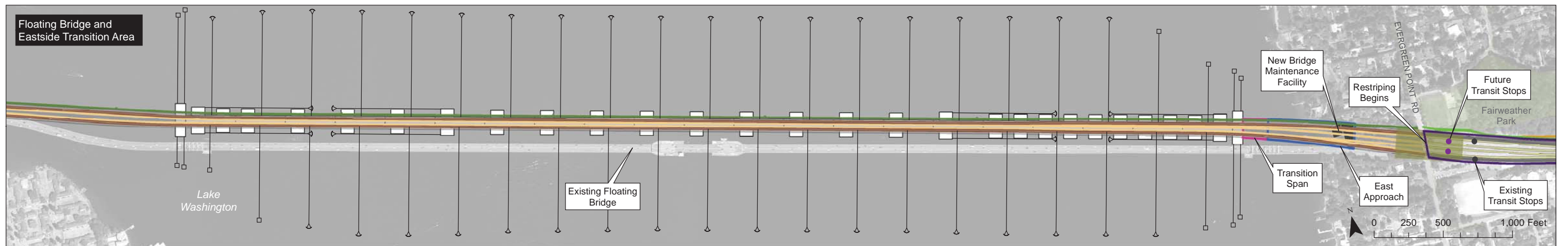
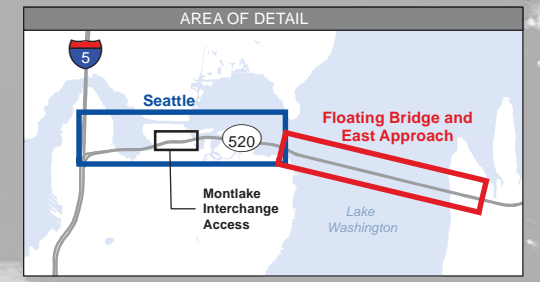
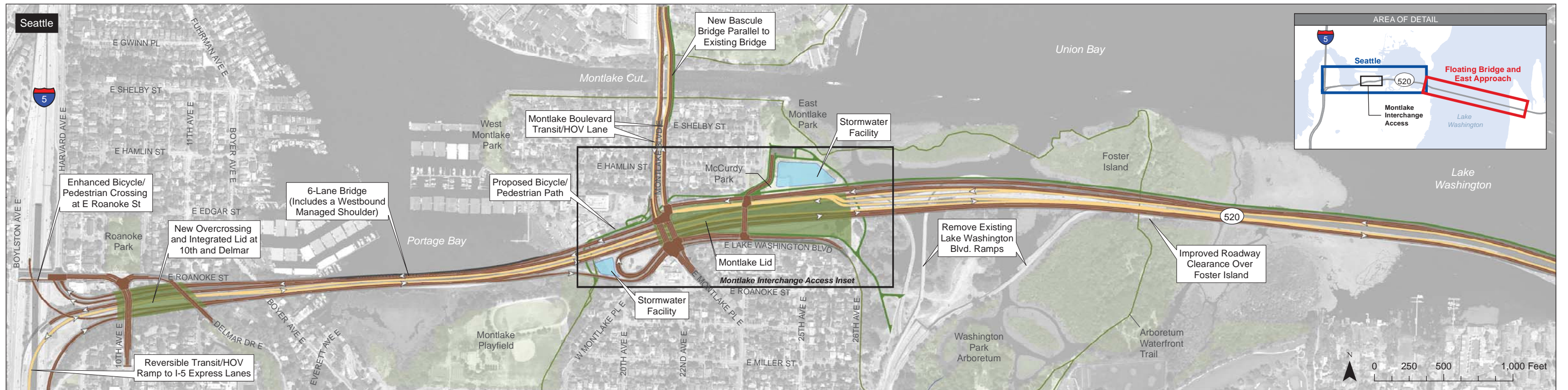
- An enhanced bicycle/pedestrian crossing adjacent to the East Roanoke Street bridge over I-5
- Reversible transit/HOV ramp to the I-5 express lanes, southbound in the morning and northbound in the evening
- New overcrossings and an integrated lid at 10th Avenue East and Delmar Drive East
- A six-lane 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



This page intentionally left blank.







**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 2. Preferred Alternative Project Elements**

I-5 to Medina: Bridge Replacement and HOV Project





Exhibit 3 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).

### Exhibit 3. Preferred Alternative Compared to SDEIS Options

Geographic Area	Preferred Alternative	Comparison to SDEIS Options A, K, and L
I-5/Roanoke Area	The SR 520 and I-5 interchange ramps would be reconstructed with generally the same ramp configuration as the ramps for the existing interchange. A new reversible transit/HOV ramp would connect with the I-5 express lanes.	Similar to all options presented in the SDEIS. Instead of a lid over I-5 at Roanoke Street, the Preferred Alternative would include an enhanced bicycle/pedestrian path adjacent to the existing Roanoke Street Bridge.
Portage Bay Area	The Portage Bay Bridge would be replaced with a wider and, in some locations, higher structure with six travel lanes and a 14-foot-wide westbound managed shoulder.	Similar in width to Options K and L, similar in operation to Option A. Shoulders are narrower than described in SDEIS (2-foot-wide inside shoulders, 8-foot-wide outside shoulder on eastbound lanes), posted speed would be reduced to 45 mph, and median plantings would be provided to create a boulevard-like design.
Montlake Area	The Montlake interchange would remain in a similar location as today. A new bascule bridge would be constructed over the Montlake Cut. A 1,400-foot-long lid would be constructed between Montlake Boulevard and the Lake Washington shoreline. 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 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 4 provides an overview of the anticipated construction stages and durations identified for the SR 520, I-5 to Medina project.

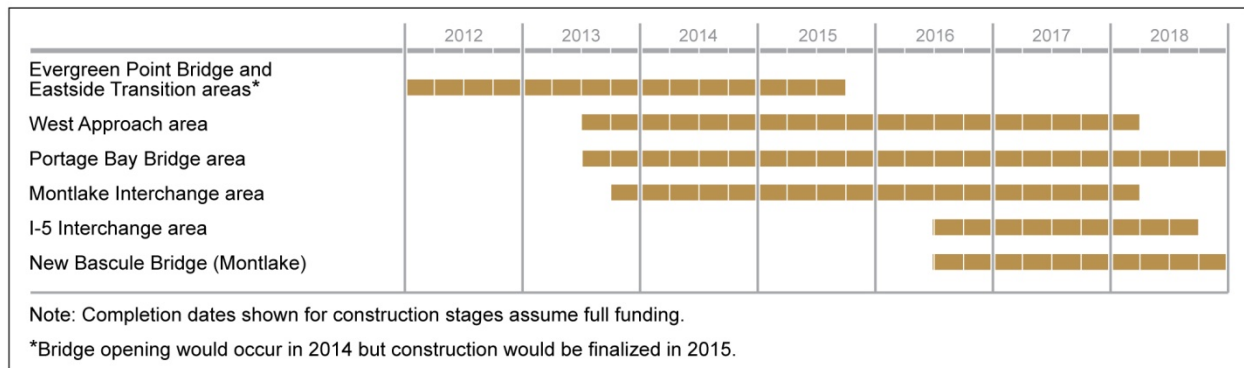


Exhibit 4. Preferred Alternative Construction Stages and Durations

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. The Federal Highway Administration (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 Environmental Impact Statement (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 in 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

### Have there been any changes to the affected environment since the SDEIS?

The 2009 Social Elements Discipline Report provides a detailed discussion of the affected environment (see pages 19 to 43), which includes neighborhood characteristics and community services within 0.5 mile of the proposed project's construction limits (WSDOT 2009a). Community services include schools, religious institutions, social institutions (community centers, health services, social service organizations, etc.), government facilities, fire and emergency medical, police, and utilities. The affected environment has not changed since the SDEIS; however, there has been additional community involvement in the development and refinement of the Preferred Alternative. New information is summarized below.

### How has the community been involved in the project since the SDEIS?

Evaluating project effects on social elements involves both an analytical process and active engagement with the affected communities. Public involvement activities provide project information to community members and offer opportunities for the public to provide input that influences project design and decisions.

WSDOT has continued to update and implement the comprehensive public involvement program since development of the 2006 Draft EIS (WSDOT 2006). The public involvement program identifies specific outreach goals and activities and is described in detail in the 2009 Agency Coordination and Public Involvement Discipline Report (WSDOT 2009b). Using best practices identified during earlier phases of the project, WSDOT has continued to engage with the broader public, along with targeting specific users of the SR 520 corridor.

Five principal constituencies have been an integral part of the public involvement effort: the general public; minority, low-income, and limited-English-proficient populations; elected officials and jurisdictions; a Westside mediation stakeholder group; and Engrossed Substitute Senate Bill (ESSB) 6392 workgroup participants, including two technical coordination teams.



The project has received many comments from the public through a range of ongoing outreach activities and tools that encourage participation. Common themes heard from the public have included:

- Protect and enhance neighborhoods and community connectivity
- Maintain local parks and trails and add a new bicycle path
- Include noise reduction measures throughout the SR 520 corridor
- Minimize air pollution
- Improve traffic flow
- Minimize visual effects
- Improve and expand the HOV and bus system

Activities in the last 2 years included a Westside mediation process and ESSB 6392 workgroup process, community and agency briefings, public open houses, and information booths at public events such as fairs and festivals. The project team uses a variety of outreach tools to reach diverse audiences, including informational videos, regularly updated project and program Websites, monthly email updates, media outreach, and information kiosks at strategic public locations.

WSDOT updates the public involvement plan regularly to reflect changes in project direction, milestones achieved, and current opportunities and challenges related to community engagement.

For more detailed information on public involvement subsequent to the SDEIS, see the Agency Coordination and Public Involvement Discipline Report Addendum and Errata (WSDOT 2011h).

## Potential Effects

The 2009 Social Elements Discipline Report provides a detailed discussion of effects of the SDEIS design options (see pages 45 through 97; WSDOT 2009a). The discussion below supplements the 2009 Discipline Report and compares the effects of the Preferred Alternative with the No Build Alternative and SDEIS Options A, K, and L using new text and new or updated exhibits where appropriate.

### How would construction of the project affect social elements?

The effects of project construction on social elements would be similar to those described for Option A in the 2009 Social Elements Discipline Report (see pages 46 through 78; WSDOT 2009a), except where noted in the description below. Design refinements included in the Preferred Alternative have resulted in an updated effects analysis based on changes to the detour routes, haul routes, noise data, and construction durations as described below.



## Community Cohesion

Effects from construction activities on community life and residents and groups located within the study area would be of limited duration. Construction activities could have several different types of effects on residents living near the construction zone. Construction-related traffic, light and glare, noise, and dust would certainly affect residents living within approximately one to two blocks of the construction zone.

Construction effects could negatively affect residents' ability to meet socially and recreate compared to existing conditions. The original construction of SR 520 bisected and isolated neighborhoods and construction activities associated with the proposed project could cause residents to avoid the disrupted areas, creating additional barriers. These barriers, however, would be temporary and the Preferred Alternative contains design features (such as lids) intended to reconnect areas that were previously disconnected. As much as feasible, construction would occur within existing WSDOT rights-of-way; however, certain elements would require property acquisitions that would affect community cohesion. Further discussion of operational effects are discussed below under the section "How would operation of the project affect social elements?"

Various project elements throughout the corridor would be constructed during the same timeframe. In many areas, construction activities and their effects would likely overlap, depending on the construction sequencing. Construction at multiple locations would enable the project to be constructed in a shorter timeframe, thereby reducing the amount of time neighborhoods and the social elements would be negatively affected. Construction effects would vary by neighborhood, and the amount and type of construction activities would also vary depending on the project element. See below under "Construction Effects by Neighborhood" for information about how the project would affect Seattle neighborhoods, the Lake Washington area, and the Eastside transition area.

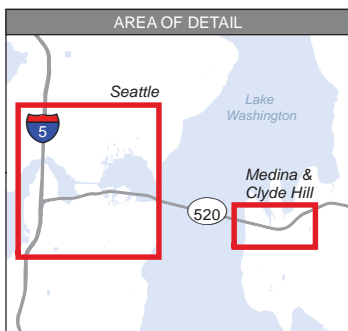
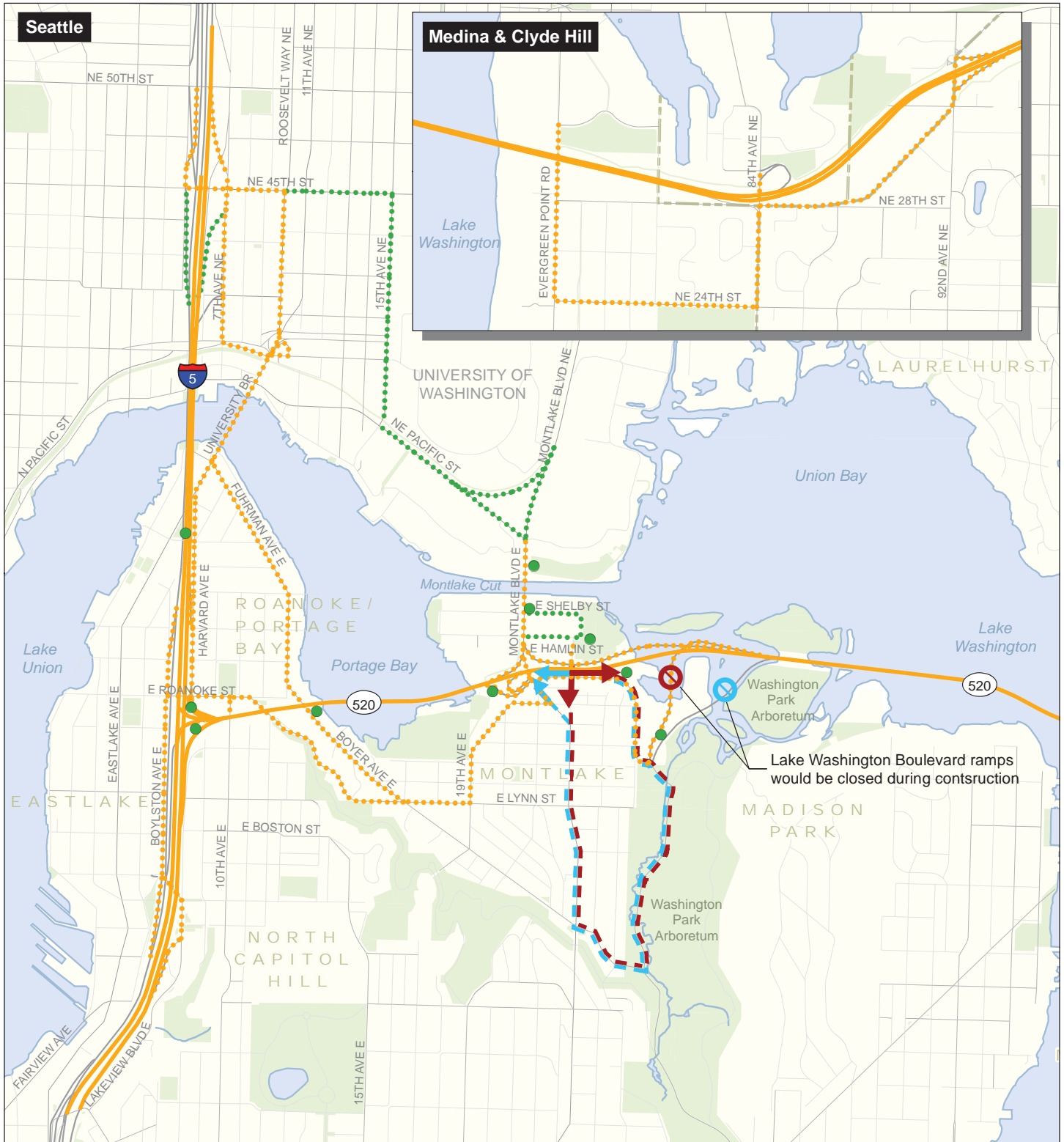
## Hauling and Transportation Effects

For the proposed project, trucks would be used to transport both workers and materials to and from portions of the project corridor construction zone. Haul routes through neighborhoods could result in negative effects related to noise, dust, and traffic congestion on the adjacent land uses and on individual neighborhoods. Local jurisdictions can limit the use of non-arterial streets for truck traffic, and will determine final haul routes for those actions and activities that require a street use or other jurisdictional permit. Exhibit 5 shows the potential haul routes that have been identified for analysis of the Preferred Alternative. Barges are also expected to be used to transport materials and demolished structures to and from the project area, which would minimize the number of trucks needed. In areas where there is no water access or where water access does not have sufficient size or depth, barges cannot be used.

Some construction activity may be required in the evening and at night. For the most part, construction vehicles would enter and exit the construction zone and staging areas at gates in the perimeter fencing surrounding the construction zone. These gates would likely be located at the







- Potential Staging Area
  - Potential Primary Haul Route (Preferred Alternative and Options A, K, and L)
  - ⋯ Potential Secondary Haul Route (Preferred Alternative and Options A, K, and L)
  - ⋯ Potential Secondary Haul Route (Options K and L)
  - Traffic re-route when Lake Washington Boulevard ramps are closed
- 0 500 1,000 2,000 Feet

Source: King County (2005) GIS Data (Streams and Streets), King County (2007) GIS Data (Water Bodies), CH2M HILL (2008) GIS Data (Parks). Horizontal datum for all layers is NAD83(91); vertical datum for layers is NAVD88.

### Exhibit 5. Proposed Haul Routes, Detour Routes and Construction Staging Areas

I-5 to Medina: Bridge Replacement and HOV Project

ends of streets abutting the construction zone. WSDOT would use best management practices (BMPs) to minimize effects of hauling materials on adjacent residents and neighborhoods (see the “Mitigation” section).

Isolation of the construction activities to ensure public safety would require corridor fencing, temporary road closures, and traffic detours. Use of some streets may be intermittently limited. Inconvenient driving conditions and traffic congestion would occur with the temporary road closures to allow certain construction activities. In addition, direct access to and from some buildings may be disrupted, though not eliminated, for short periods of time. Disruptions in access would occur mainly at night and during off-peak hours.

The closures and detours would be needed for varying periods of time. As project construction progresses, the road closures and traffic detours would change to best accommodate construction needs and to minimize traffic congestion. Specific routes would be determined both during project permitting and as part of ongoing construction management activities. At this time, it is expected that portions of SR 520 would be closed at night (between the hours of 9 p.m. and 5 a.m.) and on weekends to accommodate certain portions of construction and to reduce peak hour closures.

Dust and diesel odors from construction activities typically affect only people close to the activity. With the use of BMPs, they are not expected to affect nearby residences. See the Air Quality Discipline Report Addendum and Errata (WSDOT 2011f) for more information.

## **Aesthetic and Noise Effects**

Visual effects would be caused by the presence of construction equipment, vegetation removal, construction bridges, and glare from any nighttime construction. See the Visual Quality and Aesthetics Discipline Report Addendum and Errata (WSDOT 2011e) for a detailed description of visual effects.

In the immediate construction area, noise from specific construction equipment may travel up to 0.5 mile from the construction zone. Residents generally would hear noise associated with the operation of construction equipment up to a distance of approximately one to two blocks. Residents living within close proximity of construction activities would be able to view construction activities and equipment storage areas within the fencing, especially from top floors of buildings. Lights would be directed at construction activities and shielded, but residents would see some lighting and glare. Light and glare would primarily affect residents with windows in direct line-of-sight of construction activities. Noise effects, however, would extend up to two blocks away or more.

Exhibit 6 was developed to provide readers with a general understanding of how loud construction might be. It identifies the worst-case noise levels and expected typical noise levels based on four general construction scenarios as measured at 50, 100, and 200 feet from the construction activity. The actual noise levels experienced during construction would generally be lower than those described in this report.



## Exhibit 6. Noise Levels for Typical Construction Phases (dBA)

Scenario	Equipment		Distance from Activity		
			50 feet	100 feet	200 feet
Preparing for construction of new structures	Air compressor, backhoe, concrete pump, crane, excavator, forklift, haul truck, loader, water pump, power plant, service truck, tractor trailer, utility truck, and vibratory equipment	Max	94	88	82
		Typical	87	81	75
Constructing new structures and paving roadways	Air compressor, backhoe, cement mixer, concrete pump, crane, forklift, haul truck, loader, paver, pump, power plant, service truck, tractor trailer, utility truck, vibratory equipment, and welder	Max	94	88	82
		Typical	88	82	76
Conducting miscellaneous activities	Air compressor, backhoe, crane, forklift, haul truck, loader, pump, service truck, tractor trailer, utility truck, and welder	Max	91	85	79
		Typical	83	77	71
Demolishing existing structures	Air compressor, backhoe, concrete saw, crane, excavator, forklift, haul truck, jackhammer, loader, power plant, pneumatic tools, water pump, service truck, and utility truck	Max	93	87	81
		Typical	88	82	76

Note: Noise levels may vary at distances due to topography, buildings, vegetation, etc. These numbers should be used as reference only, not to determine specific sound levels at specific properties.

dBA = A-weighted decibels

The high noise levels listed would be experienced during peak construction periods, when multiple types of equipment are running and heavy loads are being transported. Activities such as demolishing existing structures would generate very loud noise, particularly in the Montlake area and Portage Bay, due to the equipment used and the close proximity to residences. Exhibit 7 illustrates common noise sources and compares their relative loudness to that of an 80-A-weighted decibel (dBA) source, such as garbage disposal or food blender. As shown, construction noise at a distance of 50-feet would be moderately loud to very loud.

### Pile-Driving

Construction of certain project elements would also require pile-driving, and noise effects from pile-driving would be the greatest in adjacent neighborhoods. Noise levels for pile-driving depend on the frequency of pile-driving and the number of pile-drivers operating at one time in any one area. In general, pile-driving would take place throughout the in-water work windows and would be limited to daytime hours to minimize effects on neighborhoods and meet the requirements of the local noise ordinance.

Exhibit 8 provides a graph of a maximum pile-driving noise level based on 105 dBA at 50 feet for distances up to 1,000 feet. Pile-driving can produce short-term noise levels of 99 to 105 dBA at 50 feet. Actual levels can vary, depending on the distance and topographical conditions between the pile-driving location and the receiver location. Best management practices such as coating the piles, using pile pads, or using piston mufflers could be implemented to reduce noise effects.





Noise Source or Activity	Sound Level (dBA)	Subjective Impression	Relative Loudness (human judgment of different sound levels)
Jet aircraft takeoff from carrier (50 feet)	140	Threshold of pain	64 times as loud
50-horsepower siren (100 feet)	130		32 times as loud
Loud rock concert near stage Jet takeoff (200 feet)	120	Uncomfortably loud	16 times as loud
Float plane takeoff (100 feet)	110		8 times as loud
Jet takeoff (2,000 feet)	100	Very loud	4 times as loud
Heavy truck or motorcycle (25 feet)	90		2 times as loud
<b>Garbage disposal (2 feet) Pneumatic drill (50 feet)</b>	<b>80</b>	<b>Moderately loud</b>	<b>Reference loudness</b>
Vacuum cleaner (10 feet) Passenger car at 65 mph (25 feet)	70		1/2 as loud
Typical office environment	60		1/4 as loud
Light auto traffic (100 feet)	50	Quiet	1/8 as loud
Bedroom or quiet living room Bird calls	40		1/16 as loud
Quiet library, soft whisper (15 feet)	30	Very quiet	
High quality recording studio	20		
Acoustic test chamber	10	Just audible	
	0	Threshold of hearing	

Source: Beranek 1988.

#### Exhibit 7. Sound Levels and Relative Loudness of Typical Noise Sources

Pile-driving could also cause some vibratory effects; however, it is not expected that the project construction activities would negatively affect existing structures by vibration. WSDOT has worked with Section 106 consulting parties to develop a community construction management plan (CCMP) that supports BMPs and good communication to minimize impacts on historic properties within the Area of Potential Effect (APE) and members of the public potentially affected by construction. As a result of the Section 106 consultation, WSDOT has hired the services of a vibration expert to develop BMPs that would avoid or minimize the effects from vibration. WSDOT will also require construction contractors to submit a vibration monitoring plan. The CCMP is included as part of the Programmatic Agreement, and is in Attachment 9 to the Final EIS.

## Construction Duration

The long duration of construction activities would be the most obtrusive construction effect on neighborhood cohesion. Construction activities would also occur at several locations within the project corridor simultaneously. These activities together may create ongoing hardship and stress



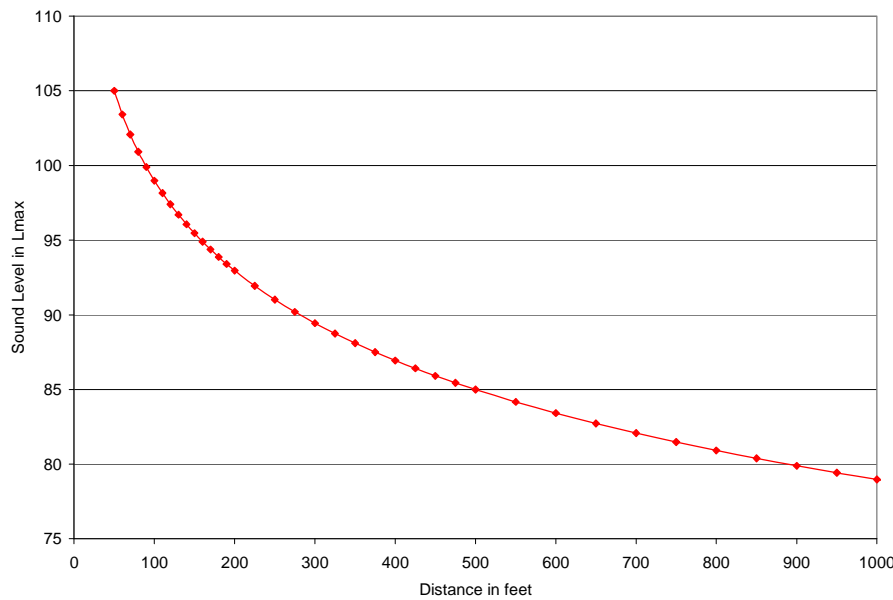


Exhibit 8. Typical Maximum Pile-Driving Noise Levels Assuming 105 dBA at 50 Feet

upon the social fabric of neighborhoods within close proximity to construction and affect residents' ability to meet socially and recreate compared to existing conditions. Construction activities associated with the proposed project could cause residents to avoid the disrupted areas.

Various project elements throughout the corridor would be constructed during the same timeframe. In many areas, construction activities and their effects would likely overlap, depending on the construction sequencing. Some types of construction may also occur 7 days a week and possibly 24 hours a day. Construction at multiple locations would enable the project to be built in a shorter timeframe, thereby reducing the amount of time neighborhoods and the social elements would be negatively affected. Construction effects would vary by neighborhood, and the amount and type of construction activities would also vary depending on the project element. Durations are discussed in greater detail by neighborhood below.

## Construction Effects by Neighborhood

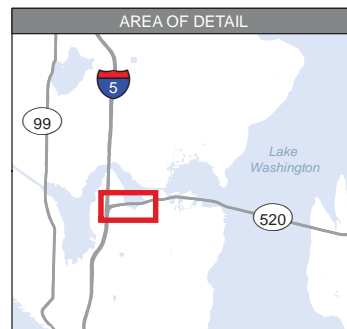
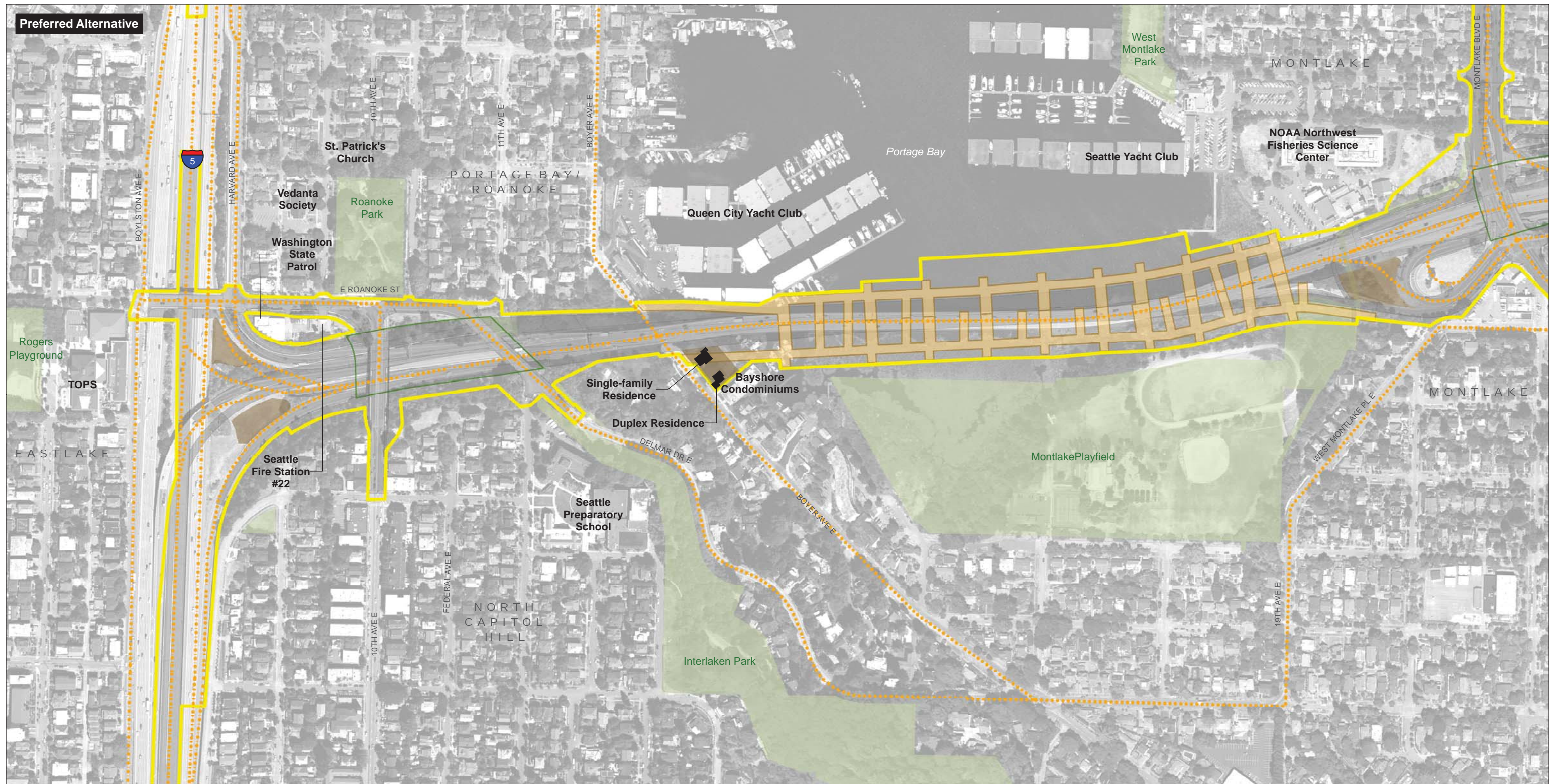
The sections below summarize design refinements and updated construction effects for the Preferred Alternative by neighborhood. This includes updated information regarding construction durations, detour routes, haul routes, and noise effects.

### Eastlake

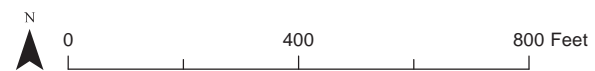
Construction would occur within the existing I-5 corridor and at the East Roanoke Street/Boylston Avenue East intersection along the eastern fringe of the Eastlake neighborhood (Exhibit 9). Construction of the I-5/SR 520 Interchange could affect the Eastlake neighborhood, including the enhanced pedestrian/bicycle crossing across I-5, adjacent to the existing Roanoke Street Bridge. As discussed below, construction could potentially affect the neighborhood's community cohesion, nearby recreation facilities and community services.







- ..... Haul Route
- ▭ Limits of Construction
- ▭ Lid or Landscape Feature
- ▭ Work Bridge
- ▭ Construction Staging Area
- ▭ Pavement
- ▭ Permanently Removed Structure
- ▭ Park



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



**Exhibit 9. Construction within the I-5 and Portage Bay Areas**  
I-5 to Medina: Bridge Replacement and HOV Project





## Community Cohesion

Eastlake neighborhood residents along Boylston Avenue East west of I-5 could experience increased noise and fugitive dust from construction activities as well as increased truck traffic. Effects would vary during the anticipated 26 months of construction to rebuild the I-5/SR 520 interchange and add the new HOV ramp, depending on which activities are occurring. Eastlake would be shielded from most of the construction noise due to existing noise walls on I-5, topography, and the density of existing structures that block the majority of the neighborhood from sightlines to I-5. Only residences in the immediate vicinity would be likely to experience a noticeable increase in noise and it would not be intrusive to regular activities.

As identified in the SDEIS, the only potential haul route within the Eastlake neighborhood would be along Boylston Avenue East (Exhibit 10). The haul route would likely be used intermittently for the duration of construction, and could average approximately 7 trucks per day. The estimated number of truck trips along Boylston Avenue East would be relatively low compared to overall arterial volumes, except during the intermittent peak construction periods (see Exhibit 10). Additionally, there have been no long-term road closures or detour routes identified within the Eastlake neighborhood. Therefore, traffic effects on the Eastlake neighborhood are expected to be minimal over the entire construction duration.

Exhibit 10. Eastlake Neighborhood Daily Truck Trips on Potential Haul Routes

Potential Haul Route	Average		Peak Construction	
	Volumes	Duration	Volumes	Duration
Boylston Avenue East (north of Roanoke)	7	70 months	60	Two weeks
Boylston Avenue East (south of Roanoke)	15	70 months	240	Intermittent

Note: The tabulated results represent worst-case conditions. See the Final Transportation Discipline Report (WSDOT 2011g) for information regarding assumptions and effects on local traffic conditions.

## Recreation Facilities

As shown in Exhibit 9, Rogers Playground is approximately 300 feet from construction activities related to the I-5 enhanced pedestrian/bicycle crossing. Construction of the crossing is expected to last approximately 12 months. Overall, the noise, dust, and traffic that may affect Rogers Playground would be minor because of the playground's distance from construction and the shielding that adjacent buildings provide (see Exhibit 9). Park users may experience some intermittent noise during periods of peak construction.

## Community Services

Noise, dust, and traffic may also affect students attending The Option Program at Seward (TOPS) school as a result of construction at the I-5/Roanoke Street crossing and the haul route on Boylston Avenue East. As shown in Exhibit 9, the TOPS school is located directly adjacent to Boylston Avenue and East Roanoke Street, across from construction. The school would likely experience noise and dust effects for the entire construction duration of the pedestrian crossing. As compared to



Option A, however, these effects would be less intensive and of shorter duration (12 months), because the Preferred Alternative would not demolish and rebuild the existing East Roanoke Street bridge. Additionally, the school may experience some noise effects from the construction of the I-5 interchange and HOV ramp, although they would be minimal due to the distance from the activities and the existing noise walls along I-5.

Increased traffic along Boylston Avenue could increase travel times for school buses and parents who drive their children to school. However, this would likely only affect those heading north or south on Boylston, and alternate routes are available. Additionally, the main entrance and the parking lot for the TOPS School are located on Franklin Avenue East, which has not been identified as a potential project haul route. WSDOT would use BMPs to minimize construction effects on the TOPS school.

### **North Capitol Hill**

Construction would occur within the existing SR 520 corridor and along 10th Avenue East on the northern fringe of the North Capitol Hill neighborhood (see Exhibit 9). Construction could potentially affect the neighborhood's community cohesion, as discussed below.

#### **Community Cohesion**

North Capitol Hill neighborhood residents on the south side of SR 520 could experience increased noise, fugitive dust, and possible vibration from construction activities to build the 10th Avenue East/ Delmar Drive East lid (see Exhibit 9). Noise and other effects would vary during the anticipated 26 months of this construction, depending on which activities are occurring. Additionally, residents could experience some intermittent noise effects from the construction of the I-5/SR 520 Interchange and HOV ramp during peak construction periods. During periods of maximum construction activity, noise would be loud to moderately loud, and could range from 71 to 88 dBA during periods of heavy construction. These noise levels would occur intermittently for the duration of construction, and would represent worst-case levels, because the existing hillside or other structures would provide some shielding for most residents of the central and western section of the neighborhood. Typical noise levels in this area would be lower than this maximum range for the majority of the construction duration.

North Capitol Hill residents may also experience noise from pile-driving activities in Portage Bay. These noise levels would likely be less than 105 dBA, because residences are generally located more than 200 feet from pile-driving activities. However, because the topography of the area would affect noise levels, the actual noise level measurements would vary depending on specific locations. Structures or areas with direct lines of sight to the Portage Bay Bridge would experience greater noise levels than those without.

Other than noise, there would be few effects on the neighborhood. No long-term road closures, detour routes, or haul routes have been identified within the North Capitol Hill neighborhood. The construction of the 10th Avenue East/ Delmar Drive East lid will occur primarily within the existing



SR 520 right-of-way, requiring minimal work on the south side of the lid to place a retaining wall and complete the 10th Avenue East connection.

### **Pedestrian and Bicyclist Facilities**

The Preferred Alternative would not require the temporary closure of Delmar Drive East or a detour route for pedestrians and bicyclists previously described for the SDEIS options. Delmar Drive would be shifted onto a portion of the new lid while the existing bridge is removed and re-constructed.

### **Portage Bay/Roanoke**

Construction activities within the Portage Bay/Roanoke neighborhood would occur along the southern fringe of the neighborhood and along Boyer Avenue East. Construction could potentially affect the neighborhood's community cohesion, nearby recreation facilities and community services, as discussed below.

#### **Community Cohesion**

Portage Bay/Roanoke neighborhood residents along East Roanoke Street and along Boyer Avenue East could experience increased noise, fugitive dust, and possible vibration from construction activities to build the 10th Avenue East/ Delmar Drive East lid and new Portage Bay Bridge (see Exhibit 9). Noise and other effects would vary during the anticipated 26 months of lid construction and 6 years of Portage Bay Bridge construction, depending on which activities are occurring.

During periods of maximum construction activity, noise levels experienced by residents closest to the lid would be loud to moderately loud. Maximum noise levels at residences within 200 feet of construction activities in this area could range from 82 to 94 dBA. High noise levels and truck traffic would be experienced only intermittently during the anticipated 26 months of 10th Avenue East/ Delmar Drive East lid construction. These noise levels represent worst-case levels, because most residents north of the lid would have some shielding from construction. Typical noise levels in this area would be less than the maximum for the majority of construction. The construction work bridges, barges, and heavy equipment used to demolish and construct the Portage Bay Bridge would be the most obtrusive construction effect on neighborhood cohesion, especially for residents along Boyer Avenue and the Portage Bay houseboat community. Noise levels for some of these residents would be very loud (up to 105 dBA) during times of pile-driving, especially because the ground slopes down to the waterfront area and many of the homes have a direct line of site to the Portage Bay Bridge. As illustrated in Exhibit 6, noise levels would decrease as distance from the source increases.

Although construction of the new Portage Bay Bridge is expected to last approximately 6 years (64 months), pile-driving activities would occur for only a small portion of this time. Exhibit 11 shows the expected number of months that pile-driving would occur during each construction season. In addition, pile-driving would occur over several non-contiguous periods, not continuously over the entire time period.



Exhibit 11. Pile-Driving for the Portage Bay Work Bridges

	Year 1	Year 2	Year 3	Year 4	Year 5
Timing	Sept	Oct-Apr	Feb - Apr	N/A	Feb - Apr
Duration <sup>a</sup>	1 month	7 months	3 months	N/A	3 months
Total Piles	<100	900	200	N/A	200

<sup>a</sup> Duration is not continuous

Several potential haul routes have been identified within the Portage Bay/Roanoke neighborhood. They include East Roanoke Street, Delmar Drive East, Harvard Avenue East, and Boyer/Furhman Avenue East (see Exhibits 5 and 12). The number of truck trips on each of these roads would vary as shown in Exhibit 12. Residents along these haul routes would experience some noise and dust as trucks travel through the neighborhood; however, the estimated truck trips would be relatively few compared to the overall arterial traffic volumes. For example, on Harvard Avenue East, north of East Roanoke Street, haul route volumes could average 15 trucks per day for the duration of construction. The existing truck and bus count at this location is more than 690 per day, so an additional 15 trucks per day would not be a significant change.

Exhibit 12. Portage Bay/Roanoke Neighborhood Daily Truck Trips on Potential Haul Routes

Potential Haul Route	Average		Peak Construction	
	Volumes	Duration	Volumes	Duration
East Roanoke Street	30	21 months	170	Intermittent
Delmar Drive East	20	21 months	160	Intermittent (1 month total)
Harvard Avenue East	15	70 months	110	Intermittent (2 months total)
Boyer Avenue	20	70 months	230	Intermittent

Note: The tabulated results represent worst-case conditions. See the Final Transportation Discipline Report (WSDOT 2011g) for information regarding assumptions and effects on local traffic conditions.

During construction, East Roanoke Street would experience temporary lane closures and detours during the realignment work. These would include short-term closures during off-peak times, which might require brief detours for approximately 15 months, resulting in temporarily restricted access to properties along East Roanoke Street. At least one lane would be open at all times to allow traffic access on East Roanoke Street. No long-term (meaning approximately as long as the total construction duration) road closures, or detour routes have been identified within the Portage Bay/Roanoke neighborhood.

During the 64-month construction period for the Portage Bay Bridge, access to and from private moorage along the south end of Portage Bay would be limited. Where practicable, work bridges would be designed to provide adequate clearance underneath; however, at times, access beneath the work bridges would not be possible in order to ensure public safety. Boats would also not be





allowed to pass underneath the Portage Bay Bridge during demolition activities. WSDOT would work with private boat owners at the south end of Portage Bay to ensure access or find alternate moorage. Traffic around opening day of boating season would not be impeded by construction or barge movement and moorage because WSDOT has committed to timing its construction activities to avoid such interference.

As for Option A, construction of the Preferred Alternative would require the removal of one single-family residence and one duplex residence in the Portage Bay neighborhood, south of the Portage Bay Bridge. The “Operation Effects by Neighborhood” section below discusses the effects of removing these residences. Some moorage at the Portage Bayshore Condominiums and Queen City Yacht Club would also be temporarily relocated during construction of the work bridges. Upon completion of the project, the work bridges would be removed and the moorings would be restored.

## **Recreation Facilities**

### ***Roanoke Park***

As with Option A, the construction activities in the immediate vicinity of Roanoke Park (primarily those needed to construct the 10th Avenue East/ Delmar Drive East lid and realign the East Roanoke Street/10th Avenue East/East Delmar Avenue intersection) would generate dust, noise, and visual effects that would be noticeable to park users. Park users may want to avoid the southern edge of Roanoke Park during peak construction, but would be able to use the rest of the park although intermittent construction noise would be audible. The activities involving earth movement or use of heavy equipment near the park would last approximately 26 months. Bicycle and pedestrian access to the park from East Roanoke Street would be limited during portions of the work on East Roanoke Street, but construction activities would not disturb the other access points or on-street parking on the other three sides of the park.

### ***Bagley Viewpoint***

As with the SDEIS options, the entire Bagley Viewpoint site would be permanently acquired for the 10th Avenue East/ Delmar Drive East lid (see Exhibit 9). The site would be purchased and in use for project access and staging at the start of construction, during which time it would be fenced and inaccessible to the public. The Roanoke steps alongside SR 520, which access Bagley Viewpoint, also fall within the construction limits, and would be closed and unavailable during construction of the 10th Avenue East/ Delmar Drive East lid, and possibly during construction of the Portage Bay Bridge. However, access to the Roanoke steps would be restored after construction is complete. The City of Seattle and local residents would cooperatively determine the exact nature and character of that restoration.

### ***Interlaken Park***

Since SDEIS publication, WSDOT has confirmed that there would be no construction easements required in Interlaken Park. The work on curbs and sidewalks would all be within road right-of-way. The Preferred Alternative would not involve the temporary closure of Delmar Drive East and would not require a detour route that would have affected park access. Accordingly, the bicycle and



pedestrian detours would not be necessary. A haul route along Delmar Drive East alongside the park would still likely be used.

Under the Preferred Alternative, there would be no curb cuts at park driveways or any other on-the-ground effects in the park itself. Interlaken Park would not be likely to experience effects associated with construction of the 10th and Delmar lid, as the closest that this portion of construction would now come to the park (other than the haul route) would be approximately 100 feet away to the north. Park users would likely hear some noise from construction of the 10th and Delmar lid for approximately 26 months and noise from pile-driving at the work bridges along the Portage Bay Bridge for approximately 14 months. Use of Delmar Drive East as a haul route would not likely produce traffic, noise, or dust that would affect users of Interlaken Park.

### **Community Services**

As with the SDEIS options, there are no anticipated construction-related effects on schools, social institutions, or government facilities within the Portage Bay/Roanoke neighborhood. The section below summarizes effects on other types of community services. These effects would be similar to those described for Option A.

#### ***Religious Institutions***

Construction-related traffic congestion and noise around the areas of the I-5/Roanoke Street crossing, the 10th Avenue East/ Delmar Drive East lid, and East Roanoke Street may affect members of the Vedanta Society and St. Patrick's Church. Like other nonresidential social resources, access to buildings would be a concern, as many people generally would need to arrive at one time for services and events. For these religious institutions, access to buildings and the institution's off-street parking lot would be important. In addition, pedestrians, transit riders, and motorists would need general access to the immediate area in order to access religious institutions. Effects on access would be less intensive because the 10th Avenue East and Delmar Drive East undercrossings would both remain open during construction.

Peak periods of construction could also disrupt the use of the Vedanta Society and St. Patrick's Church and the personal enjoyment of services. Most services include periods of quiet time for prayer and contemplation, which construction noise could disturb. Both buildings are at least 400 feet from construction and have some shielding from trees and adjacent buildings, which may reduce some effects.

#### ***Emergency Services***

Police, fire, and medical emergency vehicles would experience increased traffic congestion and delay on the undercrossing streets (such as East Roanoke Street) due to nearby construction activities. This would directly affect response times to locations within and near the construction area. Seattle Fire Department Station #22 may experience an increase in noise and dust due to its proximity to construction activities; however, access will remain and construction would not interfere with its operation beyond the effects listed above for all emergency services.



### **Utilities**

Construction activities near the water main that crosses SR 520 between 10th Avenue East and Delmar Drive East (as well as near other utilities identified during project development and design) could require relocation or protection of the utility, depending on the depth of construction and its intensity (for example, pile-driving activities would have a greater intensity). Prior to construction, the exact extent of the potential effects would be identified, exact location and depth of the utility would be verified, and the method for addressing the effects would be agreed upon.

### **Pedestrian and Bicyclist Facilities**

As previously discussed, the Preferred Alternative would not require the temporary closure of Delmar Drive East or a detour route for pedestrians or bicyclists.

### **Montlake**

Construction within the Montlake neighborhood would occur in the central part of the neighborhood and within the existing Montlake Interchange and along Montlake Boulevard NE. (Exhibit 13). As discussed below, construction could potentially affect the neighborhood's community cohesion and nearby recreation facilities, community services, and pedestrian, bicyclist, and transit facilities.

### **Community Cohesion**

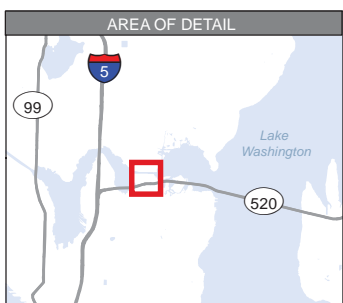
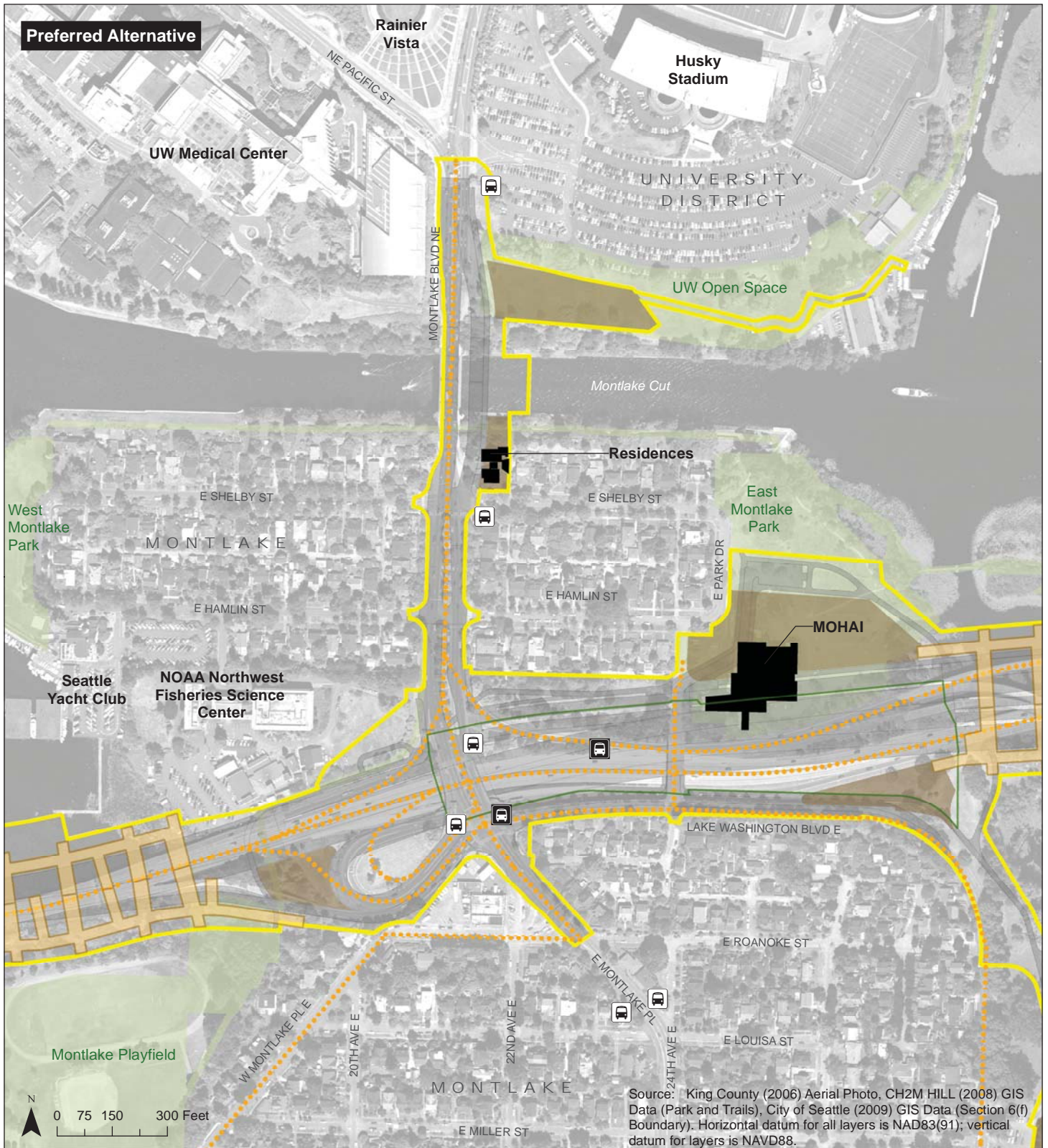
The Montlake neighborhood residents adjacent to SR 520 and on either side of Montlake Boulevard would have the potential to experience increased noise and fugitive dust from construction activities to construct the Montlake interchange and lid and new bascule bridge (see Exhibit 13). Noise and other effects would vary during the approximately 56 months of lid construction and approximately 29 months of new bascule bridge construction, depending on which activities are occurring.

During periods of maximum construction activity, noise for residents closest to the lid and new bascule bridge would be loud to moderately loud, and could range from 82 to 94 dBA during times of heavy construction (see Exhibit 13). These noise levels would occur intermittently for the duration of construction and represent worst-case levels. Typical noise levels for the Montlake area would be less than the maximum noise levels listed for the majority of the construction duration. Some residents may also experience noise from pile-driving, although effects would vary greatly by location. Residents along the western and eastern edges of the neighborhood would experience the greatest effects from pile-driving due to the proximity to Portage Bay Bridge and East Approach construction activities. The Washington Park Arboretum would experience the greatest effects from pile-driving, which are discussed below under "Recreation Facilities."

The Lake Washington Boulevard ramps would be closed under the Preferred Alternative. The Lake Washington Boulevard westbound off-ramp would be closed at the beginning of the construction period. As shown in Exhibit 5, drivers that would normally exit or enter at the Lake Washington Boulevard ramps would be re-routed to the Montlake Boulevard interchange via 24th Avenue East or Lake Washington Boulevard East. Improvements on Montlake Boulevard would occur prior to the closure of the ramps to minimize delays and queuing in the interchange area. With these







- Haul Route
- Limits of Construction
- Lid or Landscape Feature
- Work Bridge
- Construction Staging Area
- Pavement
- Permanently Removed Structure
- Bus Stop
- Montlake Freeway Station
- Park



**Exhibit 13. Construction within the Montlake Area**  
 I-5 to Medina: Bridge Replacement and HOV Project

improvements in place, traffic would operate similarly to existing conditions, and drivers would experience the same level of congestion that they currently experience. Refer to the Final Transportation Discipline Report (WSDOT 2011g) for more information on the proposed improvements and traffic operations.

Construction activities in East Montlake and McCurdy Parks (Exhibit 13) would result in noise, dust, and visual effects on park users and residents along East Shelby Street, East Hamlin Street, and Park Drive East, during the 56-month construction duration required for the larger Montlake lid. The closure of McCurdy Park and the partial closure of East Montlake Park would also prevent opportunities for residents to enjoy the facilities and amenities, as well as to use them to gather and meet socially. Residents that currently have visual access to these areas of the park would likely see construction equipment stored there, and residents on surrounding streets would experience noise from the additional truck traffic in the area from construction vehicles driving to and from construction sites. Residents on East Hamlin Street and East Shelby Street would experience fewer effects under the Preferred Alternative than under the SDEIS options because these streets are no longer identified as potential haul routes.

The revised potential haul routes also do not include the routes on Boyer Avenue East and 24th Avenue East as shown in the SDEIS. Under the Preferred Alternative, the haul route from Delmar Drive would pass along East Lynn Street, then north on 19th Avenue East to West Montlake Place East to East Roanoke Street and the northernmost portion of 24th Avenue from East Roanoke Street to SR 520. These haul routes could increase noise and traffic in the Montlake area (see Exhibits 5 and 14).

The number of truck trips on this route would range from an average of 15 to 25 trucks per day (see Exhibit 14). Residents along the haul routes would experience some noise and dust as trucks travel through the neighborhood. The estimated number of truck trips along these arterials would be relatively few compared to overall arterial traffic volumes except during the two months of peak construction.

Exhibit 14. Montlake Neighborhood Daily Truck Trips on Proposed Haul Routes

Proposed Haul Route	Average		Peak Construction	
	Volumes	Duration	Volumes	Duration
East Lynn Street to East Roanoke Street	15	70 months	120	Intermittent (2 months total)
East Roanoke Street to SR 520	20	70 months	290	Intermittent (2 months total)

Note: The tabulated results represent worst-case conditions. See the Final Transportation Discipline Report (WSDOT 2011g) for information regarding assumptions and effects on local traffic conditions.

Montlake Boulevard East could also be used as a potential haul route. Construction might also use portions of Lake Washington Boulevard from 26th Street to Montlake Boulevard East as a potential haul route and detour route after the Lake Washington Boulevard and R. H. Thomson ramps are closed.



As with Option A, the Preferred Alternative would require the acquisition of two single-family residences in the Montlake neighborhood (see Exhibit 13). The “Operation Effects by Neighborhood” section below discusses these effects. However, the Preferred Alternative would result in fewer effects on the Montlake area, because unlike Option A the Preferred Alternative would not include the acquisition of the gas station on Montlake Boulevard East. Additionally, the Preferred Alternative would permanently acquire less land within the Montlake neighborhood than all SDEIS options.

### **Recreation Facilities**

Construction of the Preferred Alternative would affect access to and use of Montlake neighborhood recreation facilities. As discussed below, the Preferred Alternative would result in effects most similar to those of Option A and would require land acquisition and/or construction easements in parts of Montlake Playfield, McCurdy Park, East Montlake Park, and the Washington Park Arboretum. See the Recreation Discipline Report Addendum and Errata for a detailed discussion of these effects (WSDOT 2011i). The Preferred Alternative would also require periodic closures of portions of the Bill Dawson Trail (Montlake Bike Path), the Ship Canal Waterside Trail, and the Arboretum Waterfront Trail that runs under SR 520. The paragraphs below summarize effects on each recreation facility.

#### ***Montlake Playfield and Bill Dawson Trail***

As with Option A, the Preferred Alternative includes construction work bridges adjacent to the Portage Bay Bridge (see Exhibit 13). Within the Montlake Playfield, a construction work bridge would be constructed to remove and replace the Portage Bay Bridge. This activity would occur at the eastern edge of the park property, where there are no developed active use features. The temporary structure would be in place for 30 to 36 months and would be removed upon completion of the south half of the Portage Bay Bridge. Construction-related dust, noise, and changes to visual character near the park are anticipated for a period of up to 64 months.

During construction, the segment of the Bill Dawson Trail within the WSDOT right-of-way would be closed for 2.5 to 3 years. Detours for pedestrians and bicyclists would be provided using on-street and sidewalk connections to maintain trail connectivity between Montlake Boulevard NE and the Montlake Playfield.

#### ***East Montlake Park and McCurdy Park***

During construction, the areas of the East Montlake Park not closed to the public would continue to provide access to adjacent Lake Washington and the Montlake Cut, where most park use generally occurs. Some parking would be retained onsite at all times during construction. The Arboretum Waterfront Trail and access to the trail would be periodically closed for construction of the new stormwater outfall and parking lot.

Detour trail routes would be provided during extended periods of closure. The kayak and canoe launch point on the Lake Washington shoreline would also be periodically inaccessible. Construction would occur in the park and near the site for up to 56 months.





Similar to all SDEIS options, the Preferred Alternative would result in permanent acquisition of the entire McCurdy Park for transportation use beginning at the start of construction (Exhibit 13). A portion of the park would be used to construct and operate a stormwater pond, and the rest would be used to construct and operate the widened SR 520 roadway, along with the connection to the new trail under SR 520.

### ***Arboretum Waterfront Trail and Ship Canal Waterside Trail***

During construction of the new Montlake bascule bridge, the Arboretum Waterfront Trail and trail access in East Montlake Park, as well as the Ship Canal Waterside Trail and trail access from Montlake Boulevard, would be periodically closed during construction for safety reasons. Detours would be provided where possible during construction (see the Recreation Discipline Report Addendum and Errata, WSDOT 2011i).

### ***Washington Park Arboretum***

Like the SDEIS options, the Preferred Alternative would remove the existing Lake Washington Boulevard ramps and the unused R.H. Thomson Expressway ramps. Although removal of the ramps would occur entirely on WSDOT property, adjacent areas of the Arboretum could be affected by dust and noise during ramp demolition. Similar to Option A, the Preferred Alternative's SR 520 roadway would cross Foster Island within the Washington Park Arboretum on a pier and span bridge. Construction would include work bridges alongside SR 520 in the west approach area, as shown in Exhibit 15. The work bridges would be removed after completion of the permanent structure; however, during construction, they would detract from visual quality, and activities (including pile-driving) on the bridges would generate noise. Construction of the west approach area adjacent to Foster and Marsh islands and the Washington Park Arboretum is scheduled to last up to 6 years.

The Preferred Alternative would allow paddling in the waterways south of SR 520 during some portions of the construction period, but movement around Foster Island would be interrupted at times for safety reasons.

The construction work bridges, barges, and heavy equipment used to demolish and construct the west approach would create the most substantial noise and visual effects in the Washington Park Arboretum. Throughout the west approach area, WSDOT would use pile-driving to construct construction work bridges. Pile-driving would take place during the established in-water work windows indicated in the Ecosystems Discipline Report Addendum and Errata (WSDOT 2011j). Pile-driving would be limited by permit conditions to avoid and minimize potential effects on park users.

Noise levels could be very loud (up to 105 dBA) during pile-driving. Although construction of the west approach is anticipated to last approximately 59 months, the pile-driving for work bridge assembly would occur for a shorter portion of this time. As indicated in Exhibit 16, approximately 7 months of pile-driving would occur during the second construction season, less than a month of pile-driving can be expected during the third construction season, and approximately 5 months during the fourth construction year. Pile-driving would not occur continuously for this entire time



period, but over several non-contiguous periods. As illustrated in Exhibit 6, noise levels would decrease as distance from the source increases.

Similar to the SDEIS options, closures of the Arboretum Waterfront Trail where it crosses beneath SR 520 on Foster Island are anticipated during construction. Construction would temporarily disrupt connectivity between the ends of the trail because a trail detour around the SR 520 construction on Foster Island could not be provided. However, the closures of the trail would be for less than 6 months and access to the trail would continue to be available from either East Montlake Park or the Washington Park Arboretum at all times, as discussed in the Section 6(f) Environmental Evaluation (WSDOT 2011k). When access to the East Montlake Park side of the Arboretum Waterfront Trail is not available, access would be available from the Washington Park Arboretum.

In addition to the construction closures of upland areas at the Arboretum, boat movements would be restricted beneath the Evergreen Point Bridge and the work bridges in areas where the work bridges are being constructed or while demolition of the existing bridge was occurring overhead. Unlike Option A, the Preferred Alternative would allow paddling in the waterways south of SR 520 during some portions of the construction period, but construction activities would interrupt movement around Foster Island at times due to safety reasons. Refer to the Recreation Discipline Report Addendum and Errata (WSDOT 2011i) for more detailed information on construction effects on the recreation facilities.

## **Community Services**

### ***Social Facilities***

The Montlake Community Center, located within Montlake Playfield, would experience effects similar to the effects on the Montlake Playfield (described above). Access to the center and the parking lot on East Calhoun Street would be maintained throughout construction. However, the center may be affected by noise and dust from construction activities, including pile-driving, for approximately 64 months. The trees surrounding the center and BMPs such as screening staging areas would further minimize visual and noise effects on the center.

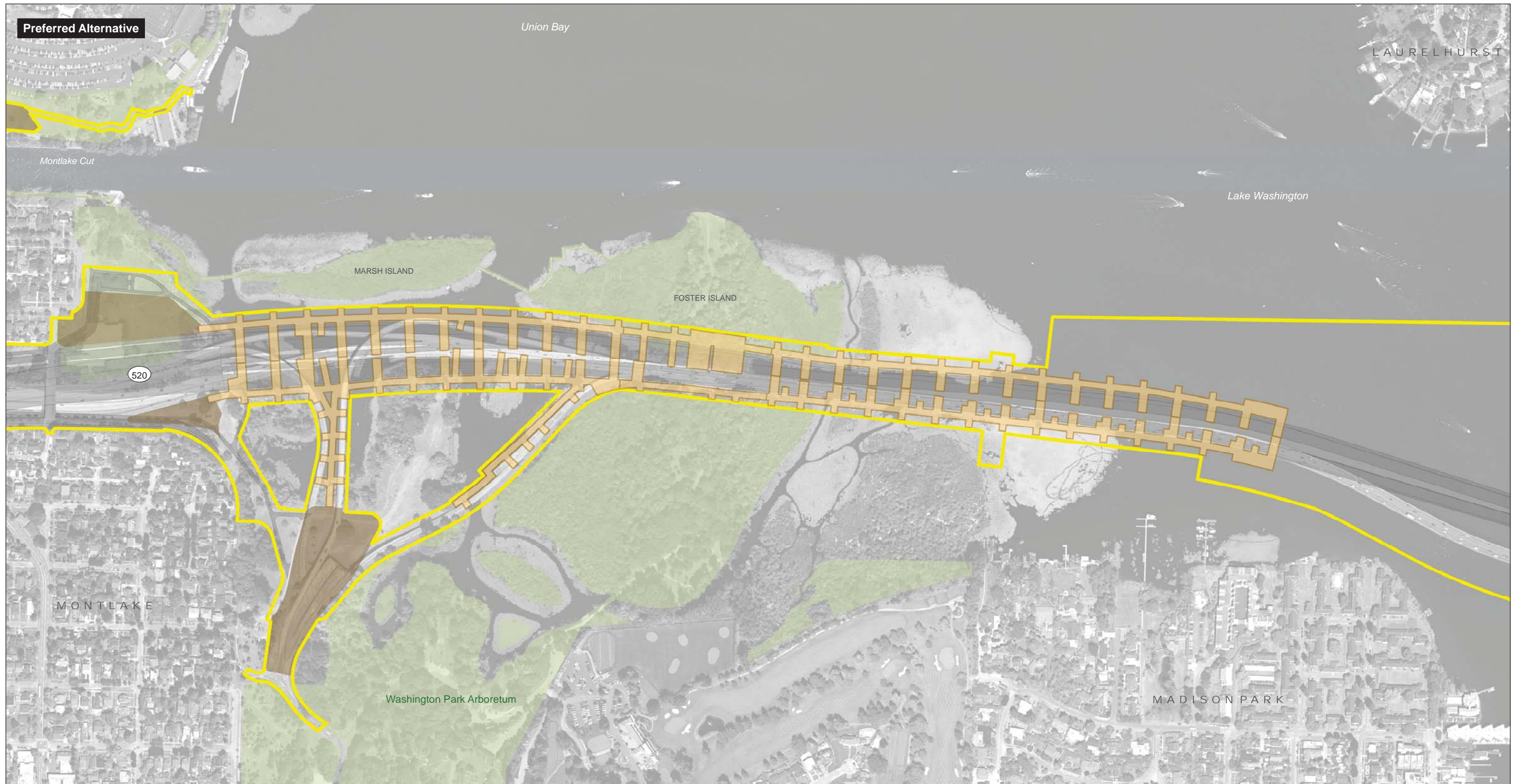
### ***Government Facilities***

Although the Preferred Alternative would not require acquisition of any buildings on the NOAA site, construction activities could affect experiments and research programs there through reduced access, utility closures, and vibration effects. Traffic congestion associated with the improvements along Montlake Boulevard East would affect access for the entire duration of construction.

The special internal water utility system used to support the lab facilities and experiments at the NOAA facility could be affected if relocating the water lines is necessary. In addition, construction activities that produce vibrations, such as pile-driving, could affect certain equipment used by the facility (e.g., electron microscopes). WSDOT and FHWA are negotiating an agreement with NOAA on measures that would resolve adverse effects to their facility and associated research functions.







Preferred Alternative

Union Bay

LAURELHURST

Montlake Cut

Lake Washington

MARSH ISLAND

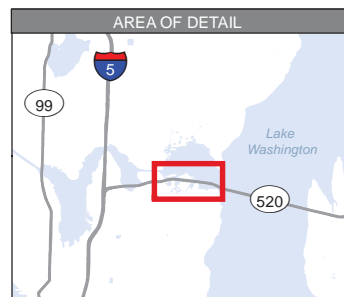
FOSTER ISLAND

520

MONTLAKE

Washington Park Arboretum

MADISON PARK



- Limits of Construction
- Work Bridge
- Construction Staging Area
- Pavement
- Park

Source: King County (2006) Aerial Photo, CH2M HILL (2008) GIS Data (Park and Trails), City of Seattle (2009) GIS Data (Section 6(f) Boundary). Horizontal datum for all layers is NAD83(91); vertical datum for layers is NAVD88.



**Exhibit 15. Construction within the West Approach Area**

I-5 to Medina Bridge Replacement and HOV Project



## Exhibit 16. Pile-Driving for the West Approach Area and Union Bay Work Bridges

	Year 1	Year 2	Year 3	Year 4	Year 5
Timing	N/A	Sept-Mar	Apr	Sept-Jan	N/A
Duration <sup>a</sup>	N/A	7 months	<1 month	5 months	N/A
Total Piles	N/A	900	450	700	N/A

<sup>a</sup> Duration is not continuous

### **Emergency Services**

Detour routes would be developed and shared with fire, emergency medical, and police organizations before construction begins in order to minimize effects and maintain access to emergency facilities. The closure of the Lake Washington Boulevard ramps may minimally affect response times.

### **Utilities**

Construction activities would include work near the water main that crosses under SR 520 at Montlake Boulevard and near the sewer lines that cross under SR 520 at Montlake Boulevard. These activities could require relocation or protection of these utilities and other utilities identified during project development and design, depending on the depth and intensity of construction activities (for example, pile-driving would be a high-intensity activity). The sewer lines are considered critical facilities that must be kept in operation. Before construction begins, the exact extent of the effects would be identified, the exact location and depth of the utility would be verified, and the method for addressing the effects would be implemented.

### **Pedestrian, Bicyclist, and Transit Facilities**

As described above in the “Recreation Facilities” section, portions of the Bill Dawson Trail and 24th Avenue East would close during construction, but pedestrians and bicyclists would be able to cross over SR 520 at Montlake Boulevard during these closures. Similar to Option A, construction along Montlake Boulevard may restrict bicycle and pedestrian access to one side of Montlake Boulevard over SR 520 during construction. Construction activities would be modified to ensure that bicycles and pedestrians in the Montlake area could cross SR 520 during the entire construction period.

The Montlake Freeway Transit Station on SR 520 would remain open most of the time during construction; however, similar to Option A, the Preferred Alternative would require relocation of transit stops on Montlake Boulevard during project construction. The existing bus stop at the Montlake Boulevard/SR 520 eastbound ramp would be closed, and riders would be redirected to a nearby stop on Montlake Boulevard. The current transit stop at the Montlake Boulevard/SR 520 westbound ramp serving northbound routes would be combined with the existing transit stop at Montlake Boulevard and East Shelby Street. The relocations of bus service would require riders to walk up to two additional blocks to access bus service.





## University District

Construction of the new bascule bridge would affect a small portion of the University District (see Exhibit 13). As discussed below, construction could potentially affect the neighborhood's community cohesion and nearby recreation facilities, community services, and pedestrian, bicyclist, and transit facilities.

### Community Cohesion

Areas within the University District including the University of Washington (UW) Medical Center, Rainier Vista, and Husky Stadium would have the potential to experience increased noise and fugitive dust from constructing the new bascule bridge (see Exhibit 13). Like the SDEIS options, the Preferred Alternative could have some negative effects on community cohesion related to access to events and activities at the UW facilities adjacent to Montlake Boulevard East.

Noise and other effects would vary during the anticipated 29 months of new bascule bridge construction, depending on which activities are occurring. During periods of maximum construction activity, noise in areas near the new bascule bridge would be loud to moderately loud. Noise levels in this area could range from 82 to 94 dBA at the closest receiver locations; however, typical noise levels are expected to be lower than the listed maximum levels for the majority of the construction duration. The higher noise levels would occur intermittently throughout the duration of construction and represent worst-case levels.

### Recreation Facilities

As with Option A, the Preferred Alternative could use portions the UW Open Space for construction staging areas (see Exhibit 13). Noise, dust, and visual effects associated with using the UW Open Space for construction staging may affect recreation users and UW staff and students that travel close to these areas. Construction of the new bascule bridge would mainly affect access to the UW Open Space adjacent to the UW Waterfront Activities Center (WAC). It would also temporarily remove 4 percent of the total parking spaces at Husky Stadium. These effects would last for up to 45 months.

### Community Services

As with Option A, the Preferred Alternative would affect community services in the following ways.

#### **Schools**

Construction activities would affect access to the educational resources at the UW campus. Students who use SR 520 and Montlake Boulevard would experience additional congestion and longer travel times to and from the campus.

Construction activities in the Washington Park Arboretum could affect educational use of the Washington Park Arboretum, which is part of its institutional mission, as a result of noise, dust, vibration, and the temporary closure of portions of the facility.



### **Emergency Services**

Access to the UW Medical Center would be maintained for emergency vehicles; however, construction activities may affect travel times to the facility from SR 520 and Montlake Boulevard. Construction of the new bascule bridge, and possibly other construction activities, could potentially affect sensitive equipment used by the Medical Center. WSDOT will continue to work with UW directly to avoid or minimize specific potential effects.

### **Pedestrian, Bicyclist, and Transit Facilities**

Similar to the SDEIS options, students traveling on SR 520 to UW may have longer travel times due to construction activities along SR 520 and in the Montlake interchange area. As with SDEIS Options A and L, construction activities along Montlake Boulevard are anticipated to cause some closures of the East Campus Bicycle Route. Where detours are required to connecting trails and bicycle facilities, those detours would also provide for connectivity to the Burke-Gilman Trail. There would be no effects on the footprint of the Burke-Gilman Trail. Construction of the Preferred Alternative would be occurring far enough away from this facility that other types of construction effects are not likely to occur.

There would be no additional construction effects on pedestrian and bicycle facilities in the University District.

### **Madison Park**

Construction of the west approach and floating bridge would affect portions of the Madison Park neighborhood (see Exhibit 15). As with the SDEIS options, the Preferred Alternative would cause no construction effects on recreation facilities, community services, or pedestrian, bicycle, and transit facilities in the Madison Park neighborhood.

### **Community Cohesion**

Madison Park neighborhood residents along the shoreline south of SR 520 would have the potential to experience increased noise and visual effects from construction of the west approach and floating bridge (see Exhibit 15). Noise and other effects would vary during the approximately 59 months anticipated for construction of the west approach, depending on which activities are occurring.

The construction work bridges, barges, and heavy equipment used to demolish and construct the west approach would create substantial noise and visual effects for residents, particularly due to the topography of the area and the views toward the bridge from the properties at a lower elevation.

Noise levels for some of these residents could be very loud (up to 105 dBA) during times of pile-driving. As indicated in Exhibit 16, approximately 7 months of pile-driving would occur during the second construction season; less than a month of pile-driving can be expected during the third construction season, and approximately 5 months during the fourth construction year. Pile-driving would occur over several non-contiguous periods throughout the expected construction duration for the west approach segment. Typical noise levels in this area would be between lower than the maximum levels listed for the majority of the construction duration.





Residents with views of SR 520 would experience negative visual effects from the construction work bridges and associated construction equipment for approximately 59 months.

The closure of the Lake Washington Boulevard ramps would also affect residents in Madison Park, who would likely use the proposed detour route, which is a more circuitous trip to and from SR 520 (see Exhibit 5).

### **Laurelhurst**

Construction of the west approach and floating bridge would affect portions of the Laurelhurst neighborhood (see Exhibit 15). As with the SDEIS options, there would be no construction effects on recreation facilities, community services, or pedestrian, bicycle, and transit facilities in the Laurelhurst neighborhood.

### **Community Cohesion**

Laurelhurst neighborhood residents along the Lake Washington shoreline north of SR 520 could experience noise and visual effects from construction of the west approach (see Exhibit 15). The construction work bridges, barges, and heavy equipment used to demolish and construct the west approach would create noise and visual effects for residents, particularly due to the topography of the area and the views from the properties toward the bridge. Noise and other effects would vary during the approximately 59 months anticipated for construction of the west approach, depending on which activities are occurring.

As discussed above under the “Madison Park” section above, the pile-driving for west approach work bridge assembly would occur for a much shorter period of time (see Exhibit 16). Noise levels for some residents could reach up to 105 dBA during periods of pile-driving. However, because Laurelhurst is more than 2,000 feet away from construction activities (including pile-driving), noise levels are anticipated to be much lower than those in Madison Park, and no negative effects from such activities are anticipated.

No long-term road closures, or detour routes have been identified within the Laurelhurst neighborhood.

### **Lake Washington and Associated Waterways**

The Preferred Alternative’s construction duration in the Lake Washington area would be up to 41 months. Although there are no social resources identified in the Lake Washington area, construction activities would affect boaters and other lake users. Since publication of the SDEIS, modifications were made to the construction sequence to ensure that deeper water access for larger boats to and from moorages on Lake Washington would be maintained during construction. For safety reasons, the ability for smaller vessels to travel around the bridge would be affected underneath the work bridges and over-water construction areas, although access through the bridge area would always be available. The Recreation Discipline Report Addendum and Errata (WSDOT 2011i) and the Navigable Waterways Discipline Report Addendum (WSDOT 2011j) provide additional information regarding effects to boating.



Pile-driving to install the work bridges, demolition of the existing bridge, and construction of the new bridge would produce noise, visual quality, and navigation effects for recreational boaters. The Ecosystems Discipline Report Addendum and Errata (WSDOT 2011j) describes the effects of pile-driving on fish and wildlife. Construction work bridges and equipment in the area would affect views.

## Medina

Construction within the Medina neighborhood would occur along the fringe of the neighborhood within the existing SR 520 corridor. As discussed below, construction could potentially affect the neighborhood's community cohesion and nearby recreation facilities, and pedestrian, bicyclist, and transit facilities.

### Community Cohesion

Similar to the SDEIS options, properties within the Medina neighborhood near the new east approach structure and the bridge maintenance facility would be exposed to noise and negative visual effects associated with the activities from the construction work bridges and barges. Approximately 41 months of construction for the east approach are expected.

Residents north and south of SR 520 would experience noise effects, including noise from pile-driving. Pile-driving activities would occur over approximately 3 months in construction year two and 4 months in construction year three (Exhibit 17). Pile-driving would occur over several non-contiguous periods, not continuously for this entire time period. Noise effects for residents of Medina would be very loud (up to 105 dBA) during pile-driving activities. Typical noise levels in this area would be lower than the maximum levels listed for the majority of construction.

Exhibit 17. Pile-Driving for the East Approach Area

	Year 1	Year 2	Year 3	Year 4	Year 5
Timing	N/A	Aug-Oct	Oct-Jan	N/A	N/A
Duration <sup>a</sup>	N/A	3 months	4 months	N/A	N/A
Total Piles	N/A	450	700	N/A	N/A

<sup>a</sup> Duration is not continuous

### Pedestrian, Bicyclist, and Transit Facilities

Construction effects would be minimal along the SR 520 corridor east of Evergreen Point Road and would consist of relocating the Evergreen Point Road transit stop, moving and realigning traffic barriers, and adding new lane and ramp striping along SR 520 within the existing right-of-way between Evergreen Point Road and 92nd Avenue NE. This work would be short-term (meaning shorter than the total construction duration). It would require closing travel lanes, so work would likely be performed at night when the roadway is used by fewer vehicles.



## How would operation of the project affect social elements?

Effects of project operation on social elements would be similar to those described for Option A in the 2009 Social Elements Discipline Report (see pages 78 through 97), except where noted below (WSDOT 2009a). Design refinements since the SDEIS included in the Preferred Alternative have resulted in changes to property relocations, noise levels, and park acquisitions (see Exhibits 18 through 20 below).

Exhibit 18. Relocation Effects

Option	Residential	Business	Civic	Total Relocations
Preferred Alternative	4	0	1	5
Option A	4	1	2 <sup>a</sup>	6
Option K	1	0	2	3
Option L	1	0	1	2

<sup>a</sup> The NOAA campus as a whole is counted as one relocation. Nine of 11 buildings affected on this property would be removed under Option A.

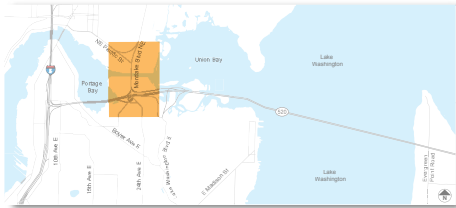
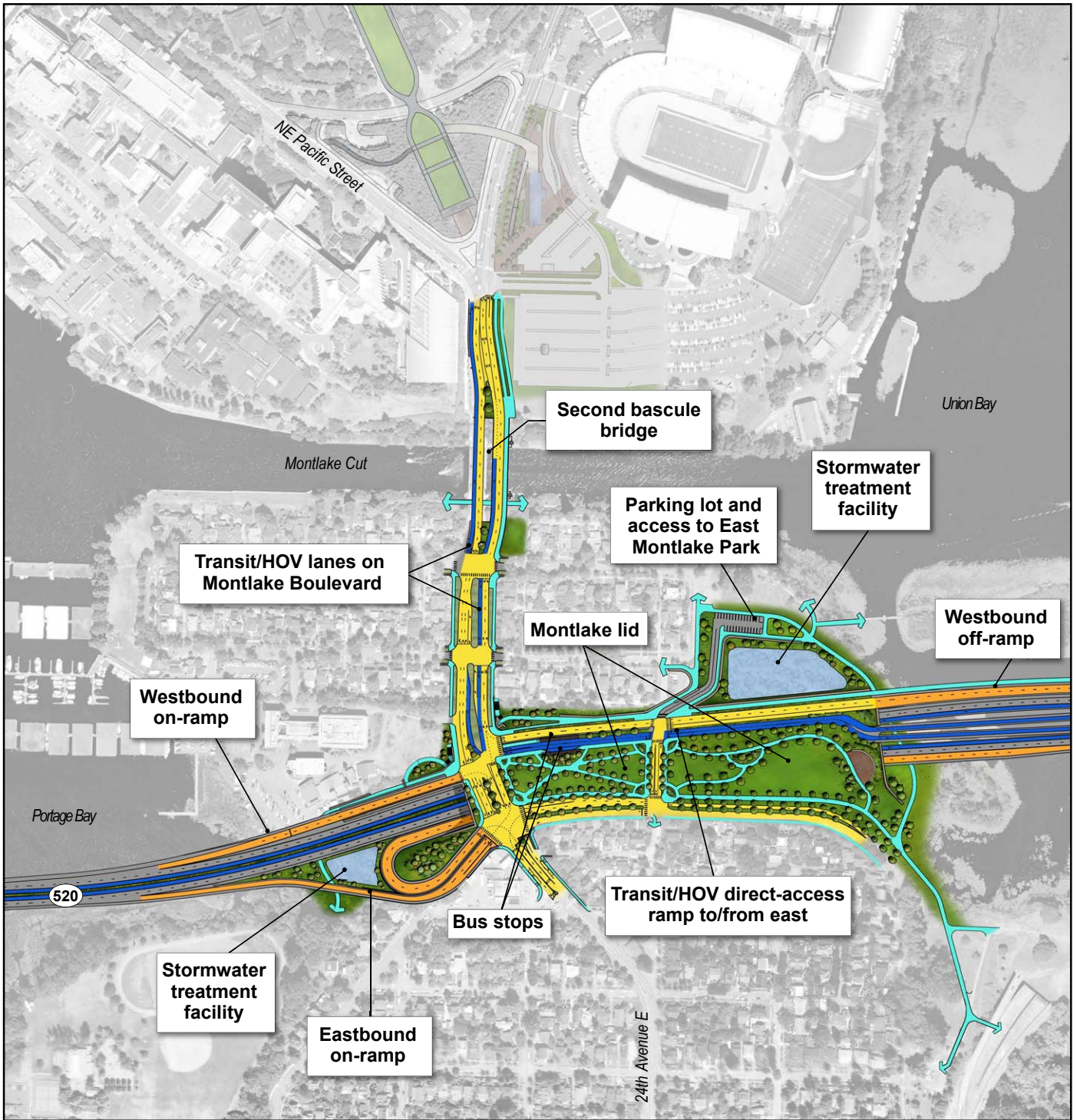
### Community Cohesion

Like the SDEIS options, project operation under the Preferred Alternative would result in several beneficial effects for the neighborhoods in the study area.

The I-5/East Roanoke Street enhanced bicycle/pedestrian crossing, the 10th Avenue East/ Delmar Drive East lid, and the Montlake lid are shown in Exhibits 19 and 20. The crossing and lids would result in beneficial effects on communities, including the following:

- Reconnecting neighborhoods originally bisected by constructing I-5 and SR 520
- Providing new green open spaces, landscaping, and pathways, providing area residents the opportunity to gather and interact with one another
- Enhancing existing access or providing safe access across the major roadways
- Providing potential health and stress-relief benefits by allowing people to connect in easily accessible and safe green areas
- Providing opportunities to observe nature, which can restore individuals' concentration and improve productivity
- Bringing diverse groups together and strengthening social ties to those who live in surrounding areas
- Improving visual quality of the neighborhood for many area residents, as they would have a reduced view of the major roadway





Vicinity map

**LEGEND:**

- General-purpose lane (SR 520)
- General-purpose lane (local)
- Transit/HOV lane
- On- and off-ramp
- Bicycle and pedestrian path



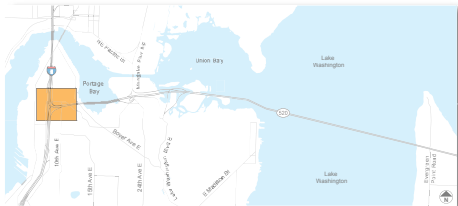
**CONCEPTUAL**



**Exhibit 19. Potential Lid at Montlake Boulevard Interchange (Update to Exhibit 21 of the 2009 Discipline Report)**

I-5 to Medina: Bridge Replacement and HOV Project





Vicinity map

**LEGEND:**

- General-purpose lane (SR 520)
- General-purpose lane (local)
- Transit/HOV lane
- On- and off-ramp
- Bicycle and pedestrian path



North  
Not to Scale

**CONCEPTUAL**



**Exhibit 20. Enhanced Bicycle/Pedestrian Crossing at I-5/East Roanoke and Conceptual Lid at 10th and Delmar (Update to Exhibit 22 of the 2009 Discipline Report)**

I-5 to Medina: Bridge Replacement and HOV Project



Operation of the SR 520, I-5 to Medina: Bridge Replacement and HOV Project would not negatively affect community life, persons, or groups; displace any affordable housing or social facilities; or impede access for those who live and work in the study area. Although the project would require some relocations and change some land to transportation uses, it would not create a new corridor or result in any other land use changes in the study area. Exhibit 18 lists the number of relocations that would be required for the Preferred Alternative compared to the SDEIS options. Refer to the Land Use, Relocations, and Economics Discipline Report Addendum and Errata (WSDOT 2011d) for more information on acquisitions and relocations.

Operation of the Preferred Alternative would result in no noticeable change in air quality, either locally or regionally. The project is not expected to cause or contribute to any new violations of air quality standards and would meet conformity requirements. For additional information on air quality, refer to the Air Quality Discipline Report Addendum and Errata (WSDOT 2011f).

The Preferred Alternative roadway and bridges would be as narrow and as low as possible to minimize and balance effects on the adjacent neighborhoods. However, in certain areas, the proposed widened project corridor would involve improvements that would bring transportation-related elements closer to some residences, which could cause negative noise and/or visual effects.

Noise modeling indicates that operation of the Preferred Alternative would result primarily in beneficial effects on noise levels in the neighborhoods. As shown in Exhibit 21, the number of residences overall that exceed the noise abatement criteria (NAC) would decrease from 284 under the No Build Alternative to 207 under the Preferred Alternative.

Exhibit 21. Number of Residences Where Noise Levels Would Exceed the NAC (Update to Exhibit 23 of the 2009 Discipline Report)

Neighborhood	Existing	No Build Alternative	Preferred Alternative	SDEIS Options		
				Option A	Option K	Option L
Portage Bay/Roanoke	24	24	22	26	27	27
North Capitol Hill	99	101	53	89	89	83
Montlake – North of SR 520	37	42	34	27	28	28
Montlake – South of SR 520	63	67	48	57	52	45
University District <sup>a</sup>	2	4	7	2	2	4
Washington Park Arboretum <sup>a</sup>	22	22	27	16	27	22
Madison Park	16	16	7	10	10	5
Laurelhurst	0	0	0	0	0	0
Medina	26	30	8	21	21	21
<b>Total</b>	<b>289</b>	<b>306</b>	<b>207</b>	<b>248</b>	<b>256</b>	<b>235</b>

Note: The numbers shown indicate effects without noise walls added as mitigation.

<sup>a</sup> The residential equivalents are rounded up to the nearest whole number.

In many locations in the project corridor, where noise levels would still exceed the NAC, the increase in noise would usually be no more than 2 dBA, although a few locations would increase up



to 4 dBA. An increase of 3 dBA is the point where the increase becomes perceptible to most people. In addition, there are locations where the noise levels would remain above the NAC but would decrease by at least 4 dBA, which would be a perceptible change.

The “Operation Effects by Neighborhood” section below provides more information on the noise effects on the neighborhoods. Refer to the 2009 Noise Discipline Report (WSDOT 2009c) and Noise Discipline Report Addendum and Errata (WSDOT 2011c) for further information on noise effects in the study area.

## Regional and Community Growth

Operation of the Preferred Alternative would not result in any negative effects on community growth. There are limited opportunities for growth within the study area due to the lack of available land. The project would improve travel times for transit, carpools, and vanpools, and would improve safety and reliability along the corridor. The Preferred Alternative would support the planned growth in the Puget Sound region by providing improved access between urban centers, and would not induce any unwanted growth or contribute to sprawl.

## Recreation Facilities

Like the SDEIS options, operation of the Preferred Alternative would result in both negative and positive effects on the recreation facilities in the study area. The lids would include open space with grassy areas and pathways, which would be a new recreation element for adjacent neighborhood residents. The continuous pedestrian and bicycle pathway across Lake Washington would be a new transportation facility that provides regional recreational connections. Exhibit 22 lists permanent acquisition effects that constructing the project would have on recreation facilities in the study area.

Exhibit 22. Permanent Acquisition Effects on Parks (acres) (Update to Exhibit 24 of the 2009 Discipline Report)

Resource	Neighborhood	Preferred Alternative	Option A	Option K	Option L
Bagley Viewpoint	Portage Bay/Roanoke	0.1	0.1	0.1	0.1
East Montlake Park	Montlake	2.8	2.8	5.2	4.3
McCurdy Park	Montlake	1.4	1.4	1.4	1.4
Montlake Playfield	Montlake	1.2	2	1	0.8
Ship Canal Waterside Trail	Montlake	<0.1	<0.1	0	<0.1
Washington Park Arboretum	Montlake	0.5	0.4	0.7	0.3
UW Open Space	University District	0.2	0.2	0.1	0.5
East Campus Bicycle Route	University District	<0.1	<0.1	0.1	0.1
<b>Total Acquisition</b>		<b>6.3</b>	<b>6.9</b>	<b>8.5</b>	<b>7.5</b>

Note: acreages included in the table do not include subterranean easements.



There would also be the potential for negative effects of noise and visual changes on recreation users due to the roadway being moved closer to some of the facilities. Refer to the Recreation Discipline Report Addendum and Errata (WSDOT 2011i) for more information. Also, see the Visual Quality and Aesthetics Discipline Report Addendum (WSDOT 2011e) for visualizations of the Preferred Alternative from some recreation areas in the study area.

## Community Services

Similar to the SDEIS options, operation of the Preferred Alternative would not negatively affect the religious institutions, social institutions, government facilities, or utilities in the study area.

Operation would result in improved response and travel times for public service providers along the SR 520 corridor. These benefits would be due to the addition of HOV lanes and wider shoulders, which would provide options for these public service vehicles to bypass traffic and reach incidents faster. The shift in mode from single-occupancy vehicle to transit, vanpool, and carpool would reduce congestion in the corridor. There would be no changes in service areas for any of the providers as a result of the Preferred Alternative.

## Pedestrian, Bicyclist, and Transit Facilities

Similar to the SDEIS options, operation of the Preferred Alternative would have beneficial effects for pedestrians, bicyclists, and transit riders. The new, continuous pedestrian and bicycle path would extend across Lake Washington, creating a new non-motorized link, both locally and regionally. The SR 520 Health Impact Assessment (King County 2008) indicates that the increase in available facilities would lead to an increase in pedestrian and bicycle activity, contributing to healthier neighborhoods. The enhanced bicycle/pedestrian crossing at I-5/East Roanoke and lids at 10th Avenue East/Delmar Drive East and in the Montlake area would include pathways to improve connectivity and provide access across SR 520 and I-5, improving safety for pedestrians and bicyclists.

In addition, the ESSB 6392 workgroup report (WSDOT and Seattle Department of Transportation [SDOT] 2010) recommended the following bicycle/pedestrian elements that will be implemented as part of the Preferred Alternative:

- Grade-separated connection under Montlake Boulevard to the Bill Dawson Trail
- Reconstruction of the Bill Dawson Trail within the SR 520 right-of-way
- Path along Lake Washington under SR 520 connecting to the Washington Park Arboretum
- Improved connection along 24th Avenue East between Shelby Street and Lake Washington Boulevard
- Widened sidewalk across the new bascule bridge for use as a shared use path
- Grade-separated crossing of Montlake Boulevard in the vicinity of Husky Stadium



Transit, carpools, and vanpools would all benefit from improvements in travel times due to the addition of HOV lanes on SR 520 and the reversible HOV lane to I-5. By adding HOV lanes in both directions, the proposed project would improve transit access to SR 520 and also provide a travel-time savings in the p.m. peak period for people who use transit, vanpool, or carpool along the SR 520 corridor in the study area, thereby improving mobility.

In addition, the ESSB 6392 workgroup report (WSDOT and SDOT 2010) recommended the following HOV and transit priority elements:

- Inside transit/HOV lane on Montlake Boulevard northbound between westbound off-ramp and the northern end of the Montlake drawbridge
- Outside transit/HOV lane on Montlake Boulevard southbound between Pacific Street and East Shelby Street intersection
- Traffic signal equipment installed along Montlake Boulevard to be compatible with future hardware installation for transit signal priority

The project would discourage reliance on single occupancy vehicles because of travel-time savings in other travel modes, and would encourage the use of transit and other alternative travel modes. The project would enhance public safety with the increased shoulder widths along the corridor available for stalled vehicles and other incidents.

The Montlake Freeway Transit Station would remain open for most of the time during construction of the Montlake Interchange, although periodic closures would be needed. During these closures, riders traveling to the Eastside would need to board their bus at the NE Pacific Street transit stop near the UW Medical Center. Riders who travel from the Eastside to Montlake Boulevard or the University District would need to transfer to a University District-bound bus at one of the transit stations on the east side of the Evergreen Point Bridge. Riders who currently travel from the Montlake Freeway Transit Station to downtown Seattle would need to board their bus on Montlake Boulevard.

The “Operation Effects by Neighborhood” section provides additional information on transit improvements. Refer to the Final Transportation Discipline Report (WSDOT 2011g) for more information related to transit improvements and how the functions would change from removal of the Montlake Freeway Transit Station.

## Operation Effects by Neighborhood

The information below summarizes design refinements by area as well as updated operation effects that would occur within the neighborhoods near the project. This includes updated information regarding property relocations, noise effects, and permanent park acquisitions.

### I-5 Area

The operation effects of the Preferred Alternative in the I-5 area would be most similar to those of Option A, but some effects would differ due to the following design refinement. The I-5/East



Roanoke Street lid has been replaced with an enhanced bicycle/pedestrian crossing. The undercrossing would run parallel to the existing East Roanoke Street bridge and would provide neighborhood amenities including pedestrian access as well as aesthetic improvements such as plantings and viewpoints. The updated operation effects under the Preferred Alternative are discussed below, for each neighborhood.

### **Eastlake**

As with Option A, there would be no negative operation effects on recreation facilities, community services, or transit facilities in the Eastlake neighborhood.

### **Community Cohesion**

The Preferred Alternative would include an enhanced bicycle/pedestrian crossing at the I-5/East Roanoke area, rather than a full lid. The crossing would provide a link across I-5, but would not provide areas for gathering as would the lid in Option A. As illustrated in Exhibit 21, noise levels would be lower than those under the No Build Alternative would. For other receivers where noise levels would still exceed the NAC, noise levels would decrease as much as 2 to 7 dBA in most locations. Compared to the SDEIS options, the Preferred Alternative would result in fewer residences exceeding the NAC (Exhibit 21) without constructing noise walls.

### **Recreation Facilities**

The enhanced bicycle/pedestrian crossing would provide a link across I-5 but would not include new open space for users as the lid in the SDEIS options would.

### **Pedestrian and Bicyclist Facilities**

Similar to the SDEIS options, the enhanced bicycle/pedestrian crossing at I-5 would improve connectivity and enhance the existing route for bicycles and pedestrians.

### **North Capitol Hill**

As with Option A, there would be no negative operation effects on community services or transit facilities under the Preferred Alternative. Similar to Option A, the Preferred Alternative would affect community cohesion, recreation facilities, and pedestrian and bicycle facilities as described below. See Exhibit 21 for updated information regarding noise levels in the North Capitol Hill neighborhood.

### **Community Cohesion**

The 10th Avenue East/ Delmar Drive East lid would provide a new, safe connection to the Portage Bay/Roanoke neighborhood, resulting in beneficial effects as described above in the “Common Operation Effects in the SR 520 Corridor Study Area” section. The 10th Avenue East/ Delmar Drive East lid would also reduce noise levels in the area, compared to the No Build Alternative, as shown in Exhibit 21. In most locations where current noise levels exceed the NAC, the noise levels would slightly decrease or not change under the Preferred Alternative.

### **Recreation Facilities**

The 10th Avenue East/ Delmar Drive East lid would create new open space and grassy areas for residents in the surrounding area.





### ***Pedestrian and Bicycle Facilities***

The 10th Avenue East/ Delmar Drive East lid would include pathways to improve connectivity and provide access across SR 520, improving safety for pedestrians and bicyclists.

### **Portage Bay/Roanoke Area**

The operation effects of the Preferred Alternative in the Portage Bay/Roanoke area would be the most similar to those of Option A, but some effects would differ due to the following design refinements:

- In response to community interests expressed during public review of the SDEIS, the new Portage Bay Bridge would operate as a boulevard or parkway with median plantings and there would be a posted speed limit of 45 miles per hour between I-5 and Montlake.
- By reducing the width of the inside and outside shoulders, the width of the new Portage Bay Bridge at the midpoint has been reduced from 110 feet to 105 feet.

There would be no effects on community services or transit facilities in the Portage Bay/Roanoke neighborhood. Effects on recreation facilities and pedestrian and bicycle facilities would be similar to Option A.

### **Community Cohesion**

The I-5/East Roanoke Street enhanced bicycle/pedestrian crossing and the lid at 10th Avenue East and Delmar Drive East would provide new connections to the Eastlake and North Capitol Hill neighborhoods, resulting in beneficial effects. The Bagley Viewpoint would be redesigned as part of the 10th Avenue East/ Delmar Drive East lid, restoring the function of the viewpoint without resulting in any long-term effects on views.

As illustrated in Exhibit 21, noise levels would decrease compared to the No Build Alternative. The decrease in noise levels is due to the noise-reducing effects of the 10th Avenue East/Delmar Drive East lid, the 4-foot tall concrete traffic barriers with noise-absorptive materials, and the lower posted speed limit between I-5 and Montlake. The SDEIS options would also provide lowered noise levels at numerous locations along the corridor as discussed in the Noise Discipline Report Addendum and Errata (WSDOT 2011c). Noise walls recommended and proposed as mitigation for the SDEIS options would decrease noise levels along the SR 520 corridor under those options to a greater extent than the Preferred Alternative, but those noise walls would need to be accepted by the community.

Like the SDEIS options, the Preferred Alternative would remove one single-family residence and a duplex in the Portage Bay/Roanoke neighborhood. Acquiring the residential property would not affect community cohesion because such a small percentage of residences would be affected compared to the total number of residences in the neighborhood.

### **Recreation Facilities**

Like the SDEIS options, the Preferred Alternative would permanently affect the Bagley Viewpoint (see Exhibit 22); however, a new viewpoint would be incorporated into the 10th Avenue East/



Delmar Drive East lid that would restore the panoramic views that have been available from the Bagley Viewpoint.

Although no property would be acquired from Roanoke Park, the 10th Avenue East/ Delmar Drive East lid would improve the park's setting and the experience of park users by reducing freeway noise and creating a more continuous stretch of open space south of the park. The lid would create new open space and grassy areas for residents in the surrounding area.

### **Pedestrian and Bicyclist Facilities**

Similar to the SDEIS options, the lid at 10th Avenue East and Delmar Drive East would include pathways to improve connectivity and provide access across SR 520, improving safety for pedestrians and bicyclists.

### **Montlake and West Approach Areas**

The operation effects of the Preferred Alternative in the Montlake and west approach areas would be the most similar to those of Option A, but some effects would differ due to the following design refinements:

- The Preferred Alternative includes a full lid from Montlake Boulevard to the Lake Washington shoreline, and bus stops on the lid would allow for flyer stops to and from the Eastside.
- The Preferred Alternative eliminates the existing Lake Washington Boulevard eastbound on-ramp and westbound off-ramp and the R.H. Thomson Expressway ramps. Westbound SR 520 traffic would be able to access Lake Washington Boulevard via a new intersection located on the Montlake lid at 24th Avenue East.
- The Preferred Alternative would not remove the Montlake 76 station or any buildings on the NOAA Northwest Fisheries Science Center property.

The sections below discuss these differences for each neighborhood.

### **Montlake**

The operation effects in the Montlake neighborhood would be most similar to Option A.

#### **Community Cohesion**

The Preferred Alternative would include a modified Montlake Boulevard interchange and lid. The lid would reconnect the northern and southern portions of the Montlake neighborhood, which were bisected by the original construction of SR 520. Benefits would be the same as those described above in the "Common Operation Effects" section.

As with the SDEIS options, under the Preferred Alternative MOHAI would be relocated. The agreement to relocate MOHAI was approved on July 6, 2009, although it may be some time before the relocation is complete.

As with Option A, two single-family residences would be removed in the Montlake neighborhood under the Preferred Alternative. The residences are located on the east side of Montlake Boulevard



East immediately south of the Montlake cut. Acquiring the residential properties would not affect community cohesion because so few residences would be affected compared to the total number of residences in the neighborhood. Unlike Option A, the Preferred Alternative would not require acquisition of the Montlake 76 station.

Because the Preferred Alternative would not include construction of the Lake Washington Boulevard ramps, traffic and noise would decrease through the Washington Park Arboretum, which would benefit nearby residents. No negative effects to community cohesion are anticipated from the proposed improvements along Montlake Boulevard. Refer to the Final Transportation Discipline Report (WSDOT 2011g) for more detailed information.

As illustrated in Exhibit 21, the noise levels for a number of residences north and south of SR 520 would decrease compared to the No Build Alternative. For residences where noise levels would still exceed the NAC, many would experience a decrease of 2 dBA compared to the No Build Alternative. In areas where noise levels would increase, the increase would be by 1 to 2 dBA, which would not be perceptible to most people.

The existing SR 520 divides the Montlake neighborhood. This area experiences highway-related noise and air emissions, as well as the visual intrusion of the roadway. The highway forms a physical barrier that isolates one side of the neighborhood from the other. The initial construction of SR 520 also heavily affected the northern section of the Washington Park Arboretum, and current effects would continue under the No Build Alternative. These effects include noise, air pollution, and visual intrusion, as well as the physical presence of SR 520, particularly its bisection of Foster Island.

### **Recreation Facilities**

Similar to Option A, the Preferred Alternative would convert part of East Montlake Park and all of McCurdy Park from recreational use to transportation use (see Exhibit 22). The remainder of the park, primarily along the Arboretum Waterfront Trail, the north end of East Montlake Park, and the connection to the Ship Canal Waterside Trail, would be restored to park use. The restored park areas are adjacent to Lake Washington and the Montlake cut where the majority of passive use features including wildlife observation and walking are located. The MOHAI site and associated parking lots include most of the area that would change from park use to transportation use. The non-motorized boat launch, access to the Ship Canal Waterside Trail, and the Arboretum Waterfront Trail would retain their current condition and setting.

As described for Option A, the Preferred Alternative would cross Foster Island with a pier and span bridge. The wider footprint of the new roadway would require acquisition of 0.5 acre of land north of the existing right-of-way.

The highway main line would provide approximately 16 to 20 feet of clearance above the crossing of the Arboretum Waterfront Trail on Foster Island. The Arboretum Waterfront Trail currently crosses under SR 520 in a low and narrow (8 feet high by 12 feet wide) pedestrian underpass that many trail users find unpleasant and uncomfortable. The new SR 520 structure would allow the trail to pass



between columns of an elevated structure, improving the user experience by opening views at ground level while still maintaining a relatively low profile.

Although the land underneath the footprint of the highway would be within the WSDOT right-of-way, it would be available for recreational use after construction, except for the area necessary for the columns to support the highway structure. Because the highway main line would be higher than the existing roadway, the structure would become a more dominant feature and could negatively affect the trail users' visual environment. However, traffic volumes on Lake Washington Boulevard would decrease, creating safer and quieter conditions for park and trail users. Positive effects would also include removing the R.H. Thomson Expressway ramps in the Washington Park Arboretum, which would improve the users' visual experience. Refer to the Recreation Discipline Report Addendum and Errata (WSDOT 2011i) and Land Use, Economics, and Relocations Discipline Report Addendum and Errata (WSDOT 2011d) for more information on the relocation effects related to the MOHAI facility.

### **Community Services**

Although the Preferred Alternative could result in longer response and travel times for emergency vehicles due to loss of the Lake Washington Boulevard ramps, emergency vehicles are more likely to be traveling from nearby neighborhoods, rather than across the bridge, and therefore travel times would be similar to those under Option A as described in the SDEIS.

### **Pedestrian, Bicyclist, and Transit Facilities**

As discussed above, the Preferred Alternative would close the Montlake Freeway Transit Station. However, the new Montlake lid would provide new bus stops that would be operational after construction of the project is complete, and would allow for eastbound and northbound buses. University District bus routes would continue to operate with direct service as they do under existing conditions.

The ESSB 6392 workgroup report (WSDOT and SDOT 2010) recommended specific bus stop locations, which included:

- A northbound bus stop and receiving lane located on the Montlake lid
- A southbound stop located adjacent to the Hop-In Grocery
- A pull out on the eastbound direct-access transit/HOV ramp
- An in-lane stop on the westbound ramp

Refer to the Final Transportation Discipline Report (WSDOT 2011g) for more information related to transit improvements and improved transit travel times.

### **University District**

Similar to the SDEIS options, there would be no effects associated with community cohesion or pedestrian, bicyclist, and transit facilities for the Preferred Alternative in the University District neighborhood.



### ***Recreation Facilities***

Permanent effects on recreational facilities would be similar to those under Option A. The Preferred Alternative would result in the loss of 0.2 acre of UW Open Space (see Exhibit 22) with the widened Montlake Boulevard and stormwater treatment facility at this location. Similar to the No Build Alternative, four areas would exceed the NAC near recreation facilities, including the UW Athletic Building, after construction of the Preferred Alternative. However, at most locations exceeding the NAC, noise levels would decrease between 3 and 10 dBA, which would be perceptible differences. In the other areas, the differences would not be perceptible.

### ***Community Services***

Similar to the SDEIS options, operation of the Preferred Alternative would not affect religious institutions, social institutions, government facilities, or fire, emergency medical, or police services. A number of improvements to non-motorized facilities would benefit people attending UW. Improvements to transit would reduce travel times to the University District neighborhood.

### ***Pedestrian, Bicyclist, and Transit Facilities***

Similar to Option A, operation of the Preferred Alternative would result in a number of improvements to non-motorized facilities and would benefit people attending UW. Improvements to transit would reduce travel times to the university.

### **Madison Park**

As under Option A, there would be no effects from the Preferred Alternative on recreation facilities, community services, or pedestrian, bicycle, and transit facilities. The section below describes the anticipated effects on community cohesion.

### ***Community Cohesion***

As illustrated in Exhibit 21, the noise levels under the Preferred Alternative would improve over those expected in the No Build Alternative and the SDEIS options. A few residences would experience a perceptible noise decrease, while noise levels for the remaining residences would decrease by 1 to 2 dBA, a change that is not perceptible to most people.

### **Laurelhurst**

Like Option A, under operation of the Preferred Alternative there would be no effects on the Laurelhurst neighborhood associated with recreation facilities, community services, or pedestrian, bicycle, and transit facilities.

### ***Community Cohesion***

Noise levels in the Laurelhurst neighborhood would increase by 1 dBA; however, no areas in the neighborhood would approach or exceed the NAC. Additionally, the 1-dBA increase would not be perceptible to most residents.





## Lake Washington Area

The operation effects in the Lake Washington area under the Preferred Alternative would be similar to those under the SDEIS's Option A. There would be no effects associated with recreation facilities. The sections below describe the potential effects on community cohesion and services.

### Community Cohesion

Similar to the SDEIS options, the only negative effect on community cohesion under the Preferred Alternative operation would be that residents near the bridge maintenance facility might experience negative visual quality and noise effects.

### Community Services

Similar to the SDEIS options, the Preferred Alternative would have no operation effects associated with schools, religious institutions, government facilities, or utilities.

Fire, emergency medical, and police travel response times would improve with the continuous HOV lanes and the added shoulder, which could be used by emergency personnel to bypass traffic. There would be no issues related to the clearance under the bridge required for the Seattle Fire Department fireboat stationed in Fisherman's Terminal to respond to any incidents south of the bridge.

### Pedestrian, Bicyclist, and Transit Facilities

Benefits to pedestrians, bicyclists, and transit users in the Laurelhurst neighborhood would be the same as those described in the "Common Operation Effects" section above.

## Eastside Transition Area

Like Option A, under the Preferred Alternative there would be no effects associated with recreation facilities or community services in the Eastside Transition area. The section below discusses effects on community cohesion.

### Community Cohesion

As illustrated in Exhibit 21, noise levels under the Preferred Alternative would improve in the area compared to the No Build Alternative and the SDEIS options. Several residences would have a perceptible noise decrease, while noise levels for the remaining residences would decrease by 1 to 2 dBA, a change that is not perceptible to most people. Results of the noise analysis indicate that two noise walls are recommended for the Medina area. WSDOT will consult with affected property owners to determine if noise walls will be constructed as part of the project.



# Mitigation

## What has been done to avoid or minimize negative effects on social elements?

Throughout the design process, WSDOT has taken care to avoid and minimize adverse effects on social elements. The Preferred Alternative has minimized potential social elements effects as follows:

- The width of the new Portage Bay Bridge has been reduced and its alignment has been shifted. This change has prevented the displacement of the NOAA Northwest Fisheries Science Center buildings under Option A. The width of the new Portage Bay Bridge at the midpoint has been reduced from 110 feet to 105 feet.
- In response to community interests expressed during public review of the SDEIS, the Portage Bay Bridge would operate as a boulevard or parkway with median plantings and there would be a posted speed limit of 45 miles per hour between I-5 and Montlake.
- The Montlake interchange has been reconfigured and the lid extended to beyond 24th Avenue East. This change has prevented the displacement of the Montlake 76 station that would occur under Option A.
- The Preferred Alternative does not require the closure of Delmar Drive East.
- The Montlake lid has been expanded to allow for additional open space, connection to the Washington Park Arboretum, and bus stops for east/west travel.
- The project has been designed primarily within existing WSDOT right-of-way to minimize acquisitions and encroachment into surrounding neighborhoods.

## Best Management Practices

WSDOT would implement the following BMPs to minimize adverse effects on social elements:

- WSDOT would prepare a traffic management plan, as part of the CCMP, to be approved by the City of Seattle that will identify measures and practices to minimize construction effects on local streets, property owners, and businesses (see the Final Transportation Discipline Report [WSDOT 2011g] for additional detail).
- WSDOT would use several construction noise and vibration abatement methods (including operation methods, equipment choice, or acoustical treatments) to limit the noise and vibration effects of construction. The methods might vary along the corridor, depending on the type of construction occurring (see the Noise Discipline Report Addendum and Errata [WSDOT 2011c] for additional detail).



- WSDOT would use BMPs to minimize air emissions from construction. State law requires construction site owners and/or operators to take reasonable precautions to prevent fugitive dust from becoming airborne. WSDOT would comply with the procedures outlined in the Memorandum of Agreement between WSDOT and the Puget Sound Clean Air Agency for controlling fugitive dust (see the Air Quality Discipline Report Addendum and Errata [WSDOT 2011f] for additional detail).
- WSDOT would comply with local and King County policies regarding construction activities to minimize effects on the surrounding neighborhoods.

Construction would not affect regional and community growth, so no mitigation is proposed for growth-inducing effects. Additional mitigation measures to reduce noise and dust levels, minimize visual effects, and reduce traffic congestion during construction are identified in the Noise, Visual Quality and Aesthetics, and Air Quality discipline report addenda (WSDOT 2011c, e, f) and the Final Transportation Discipline Report (WSDOT 2011g).

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

### **Mitigation for Project Construction Effects**

#### **Community Cohesion**

Mitigation measures for construction effects on community cohesion would include the following:

- Continuing to use the project Web site, provide a 24-hour telephone information line, and distribute newsletters providing information about the project. Newsletters would be sent out in the appropriate languages to facilitate effective communication with residents.
- Scheduling neighborhood meetings, as often as needed before and during construction, to keep residents informed of any construction activities.
- Coordinating with community organizations to provide information about project construction, using their meetings, Web sites, and other communication channels.
- Coordinating with local communities prior to construction to develop strategies to reduce or minimize the effects associated with construction.

#### **Recreational Facilities**

See the Recreation Discipline Report Addendum and Errata (WSDOT 2011i) for a list of potential mitigation measures for construction effects on recreational facilities.



## Community Services

Mitigation measures for construction effects on community services would include the following:

- Notifying and coordinating with the fire departments prior to and during construction regarding traffic congestion and road closures to ensure access to the construction zone is maintained.
- Notifying and coordinating with police departments prior to construction to plan for adequate staffing for traffic and pedestrian movement control.
- Notifying area businesses and residents of any disruptions or changes to services, if any are required.
- Considering the location of utilities in future detailed designs to avoid or minimize conflicts, disruption of service, and disruption of or restrictions on access and maintenance functions.
- Field-verifying the exact locations and depths of underground utilities prior to construction.
- Coordinating with the NOAA facility so that any required utility work minimizes the effects on the water utility services.

## Pedestrian, Bicyclist, and Transit Facilities

See the Recreation Discipline Report Addendum and Errata (WSDOT 2011i) and the Final Transportation Discipline Report (WSDOT 2011g) for a list of mitigation measures for effects on pedestrian, bicyclist, and transit facilities.

## Mitigation for Project Operation Effects

### Community Cohesion

Because the project would result in residences experiencing noise levels above the NAC, the Preferred Alternative would include a number of design features that would lessen noise levels throughout the corridor, including 4-foot tall concrete traffic barriers with noise absorptive materials on the surface from I-5 to the floating bridge. Refer to the Noise Discipline Report Addendum and Errata (WSDOT 2011c) for detailed information on noise reduction strategies and noise mitigation. Additional mitigation measures for operation effects on community cohesion would include the following:

- Continuing to work with local communities and other interested parties on design and landscape treatments associated with the lids.
- Implementing FHWA noise abatement requirements by coordinating with residents adjacent to the corridor to determine whether noise walls should be built.
- Working with owners and/or residents of identified relocations required by the Preferred Alternative. Mitigation for residents displaced by the Preferred Alternative would consist of



relocation assistance in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended.

### **Recreational Facilities**

See the Recreation Discipline Report Addendum and Errata (WSDOT 2011i) for a list of mitigation measures for operation effects on recreational facilities.

### **Community Services**

No negative effects on community services that would require mitigation are expected from project operation.

### **Pedestrian, Bicyclist, and Transit Facilities**

See the Recreation Discipline Report Addendum and Errata (WSDOT 2011i) and the Final Transportation Discipline Report (WSDOT 2011g) for a list of mitigation measures for operation effects on pedestrian, bicyclist, and transit facilities.

## **References**

The following list of references is in addition to those listed in the Social Elements Discipline Report.

Beranek, L.L., ed. 1988. *Noise and Vibration Control*. Revised edition. Institute of Noise Control Engineering. June 1988.

King County. 2008. SR 520 Health Impact Assessment: A Bridge to a Healthier Community.

Washington State Department of Transportation (WSDOT). 2006. Draft Environmental Impact Statement. SR 520 Bridge Replacement and HOV Program. WSDOT, Olympia, WA. August 18, 2006.

WSDOT. 2009a. *Social Elements 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. 2009b. *Agency Coordination and Public Involvement 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. 2009c. *Noise 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. *Noise Discipline Report Addendum and Errata*. SR 520, I-5 to Medina: Bridge Replacement and HOV Project. 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. Olympia, WA.

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

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

WSDOT. 2011g. *Final Transportation Discipline Report*. SR 520, I-5 to Medina: Bridge Replacement and HOV Project. Olympia, WA.

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

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

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

WSDOT. 2011k. *Section 6(f) Environmental Evaluation*. SR 520, I-5 to Medina: Bridge Replacement and HOV Project. Olympia, WA.

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

WSDOT and Seattle Department of Transportation (SDOT). 2010. *ESSB 6392: Design Refinements and Transit Connections Workgroup Recommendations Report*. SR 520, I-5 to Medina: Bridge Replacement and HOV Project. [http://www.wsdot.wa.gov/NR/rdonlyres/71503308-669C-4FCC-BFA3-5F3CCAB11F80/0/2010\\_1001\\_WG\\_LegReport\\_Final.pdf](http://www.wsdot.wa.gov/NR/rdonlyres/71503308-669C-4FCC-BFA3-5F3CCAB11F80/0/2010_1001_WG_LegReport_Final.pdf). October 1, 2010.



# **Attachment 1**

## **Errata**



# Attachment 1

## Social Elements Discipline Report Errata

The following table corrects errors in and provides clarifications to the Social Elements Discipline Report (WSDOT 2009). Information contained in this table does not change the results or conclusions of any analyses in the 2009 discipline report.

Page	Current Text	Corrected Text/Clarification
5	<ul style="list-style-type: none"> <li>Usual and accustomed fishing areas of tribal nations that have historically used the area's aquatic resources and have treaty rights</li> </ul>	<ul style="list-style-type: none"> <li>Usual and accustomed fishing areas <u>of the Muckleshoot Tribe, which has</u> <del>tribal nations that have</del> historically used the area's aquatic resources and <del>has</del> <u>have</u> treaty rights <u>for their protection and use</u></li> </ul>
23	Laurelhurst is located north of SR 520 on the west side of Union Bay.	Laurelhurst is located north of SR 520 on the <u>east</u> side of Union Bay.
88	Under all design options, one residential property and the MOHAI facility would be acquired and relocated. Acquiring the residential property would not affect community cohesion because only one property in the neighborhood would be affected.	Under all design options, <del>one two</del> -residential <u>propertyies</u> and the MOHAI facility would be acquired and relocated. Acquiring the residential <u>propertyies</u> would not affect community cohesion because only <del>one</del> -two <u>propertyies</u> in the neighborhood would be affected.



