

Social Elements Discipline Report

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

Social Elements

Prepared for
Washington State Department of Transportation
Federal Highway Administration

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December 2009

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Acronyms and Abbreviations

CTC	Concrete Technology Corporation
dBA	A-weighted decibels
EIS	Environmental Impact Statement
GIS	geographic information system
HCT	high-capacity transit
HOV	high-occupancy vehicle
I-5	Interstate 5
KCWTD	King County Wastewater Treatment Division
LEP	limited-English proficient
MOHAI	Museum of History and Industry
NAC	noise abatement criteria
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
SDEIS	Supplemental Draft Environmental Impact Statement
SPU	Seattle Public Utilities
SPUI	single-point urban interchange
SR	state route
WSDOT	Washington State Department of Transportation



Introduction

Why are social elements considered in an environmental impact statement?

The National Environmental Policy Act (NEPA) (42 United States Code 432) requires a systematic, interdisciplinary approach when considering environmental and community factors in decision-making because the social effects of major projects can be substantial and often play an important role in the quality of life for people who live in the communities around the project. This report provides the information, as identified in Chapter 458 of Washington State Department of Transportation’s (WSDOT) Environmental Procedures Manual (WSDOT 2008), needed to document potential effects on social elements in the study area related to the project alternatives.

What are the social elements addressed in this report?

For this project, the social elements discussed include community cohesion; regional and community growth; community services; and pedestrian, bicycle, and transit facilities, public services, and utilities.

A number of federal acts require that federally funded projects consider social elements in the project development and decision-making processes. In addition to NEPA, this analysis considers laws and regulations that apply to limited-English-proficient (LEP), disabled, and elderly populations. Refer to the Environmental Justice Discipline Report (WSDOT 2009a) for information on Executive Order 12898 and the analysis of effects on minority populations and low-income populations.

What are the applicable laws and regulations?

Applicable laws and regulations include Title VI of the Civil Rights Act of 1964, the Civil Rights Restoration Act of 1987, Executive Order 13166 Limited English Proficiency, the Americans with Disabilities Act, the Age Discrimination Act of 1975, and the Transportation Equity Act (TEA-21).

What are the key points of this report?

The Interstate Highway 5 (I-5) to Medina: Bridge Replacement and High-Occupancy Vehicle (HOV) Project would result in both positive and negative effects related to social elements. Most of the negative effects would result from construction. Although these negative effects would be of limited duration, some residents in the study area would experience them over a period of several years. After the project has been completed, many of the effects would be positive. The project would have the following effects on social elements:

- Residents in the study area and people who use the recreational facilities that are near construction activities would be affected by increased noise and dust levels, degraded visual quality, and



increased traffic congestion. For some people, these effects could last up to 7 years, depending on their location relative to construction activities and the design option chosen.

- Residents adjacent to proposed detour routes, staging areas, and haul routes would also be affected by increased noise and dust and visual quality effects. Depending on the design option chosen, construction activities would require approximately 83,000 to 140,000 total truck trips and an average of 1 to 5 trips per hour to transport materials to and from the various construction sites. Most truck trips would be associated with the area along Montlake Boulevard NE to and from State Route (SR) 520.
- If all the project elements are constructed at the same time, rather than in phases, the overall construction duration would be reduced; however, for people in the closest proximity to construction, the intensity of effects would be greater.
- The Montlake neighborhood would have a greater share of construction effects than other neighborhoods. Social effects within the Montlake neighborhood would include the acquisition of buildings at the National Oceanic and Atmospheric Administration (NOAA) facility and the temporary or permanent closures of a number of recreation facilities, including the Museum of History and Industry (MOHAI) and portions of the Washington Park Arboretum. Exhibit 1 provides information on the neighborhoods that would be affected by project construction.
- Option K of the 6-Lane Alternative would result in the longest construction durations and the largest number of truck trips of the three build options. Option A would have the shortest overall construction duration and the fewest truck trips.
- If WSDOT implements the proposed project in phases, additional effects on neighborhoods would relate to demobilizing and remobilizing construction activities that would not overlap in a phased scenario. The Montlake and University District neighborhoods would experience two separate periods of construction effects rather than one.



Exhibit 1. Neighborhoods Affected by Construction Activities

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 and Delmar Drive East lids	•	•	•					
Portage Bay Bridge		•		•				
Montlake Boulevard East interchange and lid		•		•				
NE Pacific Street and Montlake Boulevard NE intersection				•	•			
New bascule bridge (Options A and L)				•	• ^a		• ^a	
Tunnel from SR 520 to NE Pacific Street and Montlake Boulevard NE (Option K only)				•	•			
Single-point urban interchange (SPUI) (Options K and L)				•				
West approach				•		•	•	
East approach bridge, east abutment, and bridge maintenance facility								•
Floating bridge (includes towing, outfitting, and installing pontoons)				•		•	•	•

^a Option L only.

- Construction of the I-5 and 10th Avenue East and Delmar Drive East lids would reconnect the Eastlake, Portage Bay/Roanoke, and North Capitol Hill neighborhoods. Lids in the Montlake area would reconnect the northern and southern portions of the neighborhood. These lids would include landscaped open space areas, providing opportunities for area residents to interact with one another, space for passive recreation, and safe passage across the roadways for pedestrians and bicyclists.
- During project operation, Option K would benefit residents in the Montlake, University District, and Madison Park neighborhoods by providing two additional smaller lids that are not included in the other design options. Option K would also include a land bridge over SR 520 to improve access across Foster Island.



- The addition of lids would result in lower noise levels in many locations. In addition, noise walls, included in Option L and, potentially, Option A, would lower noise levels at other residences in the study area. Option K design does not include noise walls; however, noise levels would be lower or similar to existing conditions and to the No Build Alternative. Quieter pavement could provide a minor reduction in noise levels. For many locations where the noise level would exceed the noise abatement criteria during operation, the minor noise level increases would not be perceptible to most people.
- The proposed project 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 proposed project 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 proposed project would not result in any negative effects on utilities. The exact locations of all known utilities would be confirmed during the final design to determine the need for relocating and protecting utilities.
- The proposed project would not result in negative effects for most of the community services in the study area. The project would result in the permanent acquisition of approximately 5.55 to 7.55 acres of recreational facilities, depending on the 6-Lane Alternative design option selected. Most effects would occur at the Washington Park Arboretum, East Montlake, and McCurdy facilities. Option K would require the most land to be converted, and Option A would require the least. Options A and L would provide access under SR 520 on Foster Island, and Option K would include a land bridge for pedestrian access over SR 520.
- 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 I-5 to Medina: Bridge Replacement and HOV Project?

The I-5 to Medina: Bridge Replacement and HOV Project is part of the SR 520 Bridge Replacement and HOV Program (SR 520 Program) (detailed in the text box below) and encompasses parts of three main geographic areas—Seattle, Lake Washington, and the Eastside. The project area includes the following:

- Seattle communities: Portage Bay/Roanoke, North Capitol Hill, Montlake, University District, Laurelhurst, and Madison Park
- Eastside communities: Medina, Hunts Point, Clyde Hill, and Yarrow Point
- The Lake Washington ecosystem and associated wetlands
- Usual and accustomed fishing areas of tribal nations that have historically used the area’s aquatic resources and have treaty rights

The SR 520 Bridge Replacement and HOV Project Draft Environmental Impact Statement (EIS), published in August 2006, evaluated a 4-Lane Alternative, a 6-Lane Alternative, and a No Build Alternative. Since the Draft EIS was published, circumstances surrounding the SR 520 corridor have changed in several ways. These changes have resulted in

What is the SR 520 Program?

The **SR 520 Bridge Replacement and HOV Program** will enhance safety by replacing the aging floating bridge and keep the region moving with vital transit and roadway improvements throughout the corridor. The 12.8-mile program area begins at I-5 in Seattle and extends to SR 202 in Redmond.

In 2006, WSDOT prepared a Draft EIS—published formally as **the SR 520 Bridge Replacement and HOV Project**—that addressed corridor construction from the I-5 interchange in Seattle to just west of I-405 in Bellevue. Growing transit demand on the Eastside and structure vulnerability in Seattle and Lake Washington, however, led WSDOT to identify new projects, each with a separate purpose and need, that would provide benefit even if the others were not built. These four independent projects were identified after the Draft EIS was published in 2006, and these now fall under the umbrella of the entire **SR 520 Bridge Replacement and HOV Program**:

- **I-5 to Medina: Bridge Replacement and HOV Project** replaces the SR 520 roadway, floating bridge approaches, and floating bridge between I-5 and the eastern shore of Lake Washington. This project spans 5.2 miles of the SR 520 corridor.
- **Medina to SR 202: Eastside Transit and HOV Project** completes and improves the transit and HOV system from Evergreen Point Road to the SR 202 interchange in Redmond. This project spans 8.6 miles of the SR 520 corridor.
- **Pontoon Construction Project** involves constructing the pontoons needed to restore the Evergreen Point Bridge in the event of a catastrophic failure and storing those pontoons until needed.
- **Lake Washington Congestion Management Project**, through a grant from the U.S. Department of Transportation, improves traffic using tolling, technology and traffic management, transit, and telecommuting.



decisions to forward advance planning for potential catastrophic failure of the Evergreen Point Bridge, respond to increased demand for transit service on the Eastside, and evaluate a new set of community-based designs for the Montlake area in Seattle.

To respond to these changes, WSDOT and the Federal Highway Administration (FHWA) initiated new projects to be evaluated in separate environmental documents. Improvements to the western portion of the SR 520 corridor – known as the I-5 to Medina: Bridge Replacement and HOV Project (the *I-5 to Medina project*) – are being evaluated in a Supplemental Draft EIS (SDEIS); this discipline report is a part of that SDEIS. Project limits for this project extend from I-5 in Seattle to 92nd Avenue NE in Yarrow Point, where it transitions into the Medina to SR 202: Eastside Transit and HOV Project (the *Medina to SR 202 project*). Exhibit 2 shows the project vicinity.



Exhibit 2. Project Vicinity Map

What are the project alternatives?

As noted above, the Draft EIS evaluated a 4-Lane Alternative, a 6-Lane Alternative (including three design options in Seattle), and a No Build Alternative. In 2006, following Draft EIS publication, Governor Gregoire identified the 6-Lane Alternative as the state's preference for the SR 520 corridor, but urged that the affected communities in Seattle develop a common vision for the western portion of the corridor. Accordingly, a mediation group convened at the direction of the state legislature to evaluate the corridor alignment for SR 520 through Seattle. The mediation group identified three 6-lane design options for SR 520 between I-5 and the floating span of the Evergreen Point Bridge; these options were documented in a Project Impact Plan (Parametrix 2008). The SDEIS evaluates the following:

- No Build Alternative
- 6-Lane Alternative
 - Option A
 - Option K
 - Option L

These alternatives and options are summarized below. The 4-Lane Alternative and the Draft EIS 6-lane design options have been eliminated from further consideration. More information on how the project has evolved since the Draft EIS was published in 2006, as well as



more detailed information on the design options, is provided in the Description of Alternatives Discipline Report (WSDOT 2009b).

What is the No Build Alternative?

Under the No Build Alternative, SR 520 would continue to operate between I-5 and Medina as it does today: as a 4-lane highway with nonstandard shoulders and without a bicycle/pedestrian path.

(Exhibit 3 depicts a cross section of the No Build Alternative.) No new facilities would be added to SR 520 between I-5 and Medina, and none would be removed, including the unused R.H. Thomson Expressway ramps near the Washington Park Arboretum. WSDOT would continue to manage traffic using its existing transportation demand management and intelligent transportation system strategies.

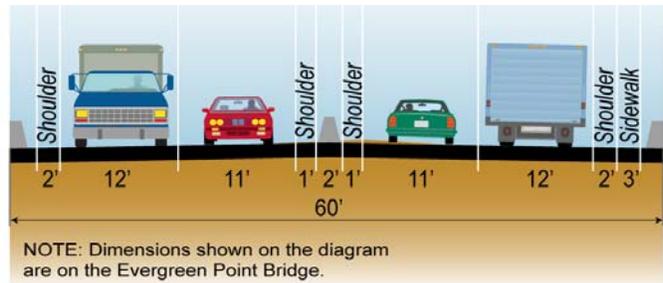


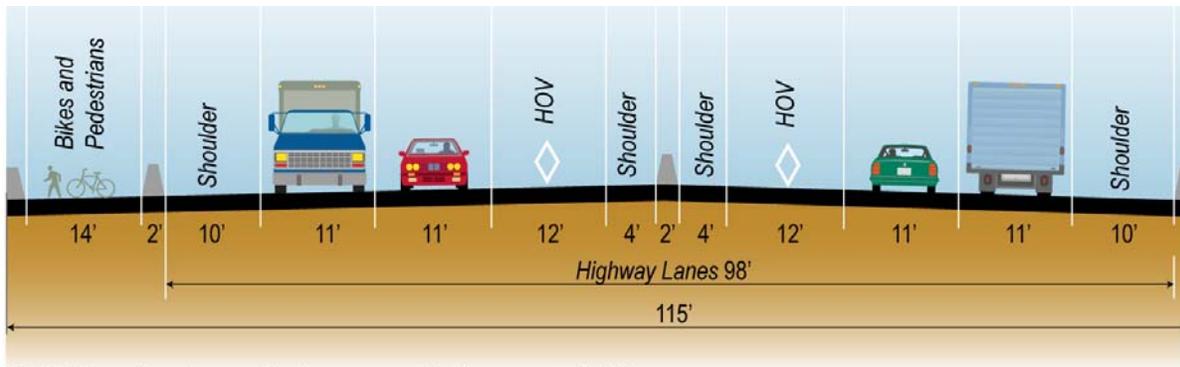
Exhibit 3. No Build Alternative Cross Section

The No Build Alternative assumes that the Portage Bay and Evergreen Point bridges would remain standing and functional through 2030 and that no catastrophic events, such as earthquakes or extreme storms, would cause major damage to the bridges. The No Build Alternative also assumes completion of the Medina to SR 202 project as well as other regionally planned and programmed transportation projects. The No Build Alternative provides a baseline against which project analysts can measure and compare the effects of each 6-Lane Alternative build option.

What is the 6-Lane Alternative?

The 6-Lane Alternative would complete the regional HOV connection (3+ HOV occupancy) across SR 520. This alternative would include six lanes (two 11-foot-wide outer general-purpose lanes and one 12-foot-wide inside HOV lane in each direction), with 4-foot-wide inside and 10-foot-wide outside shoulders (Exhibit 4). The proposed width of the roadway would be approximately 18 feet narrower than the one described in the Draft EIS, reflecting public comment from local communities and the City of Seattle.





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

Exhibit 4. 6-Lane Alternative Cross Section

SR 520 would be rebuilt from I-5 to Evergreen Point Road in Medina and restriped and reconfigured from Evergreen Point Road to 92nd Avenue NE in Yarrow Point. A 14-foot-wide bicycle/pedestrian path would be built along the north side of SR 520 through the Montlake area and across the Evergreen Point Bridge, connecting to the regional path on the Eastside. A bridge maintenance facility and dock would be built underneath the east approach to the Evergreen Point Bridge.

The sections below describe the 6-Lane Alternative and design options in each of the three geographical areas the project would encompass.

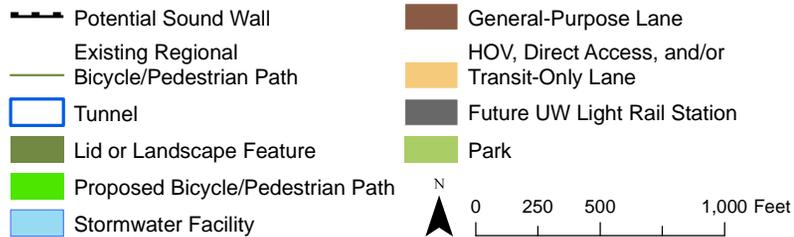
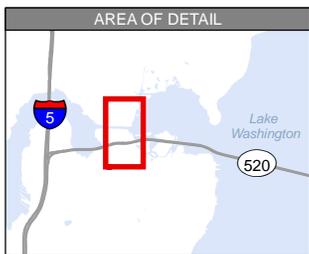
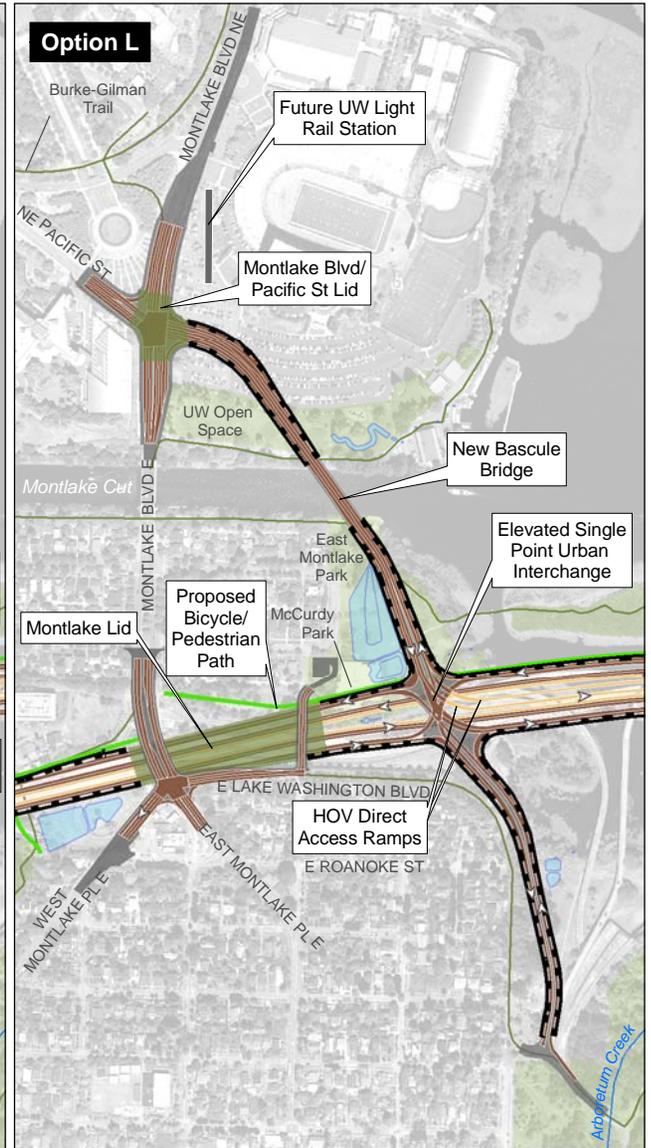
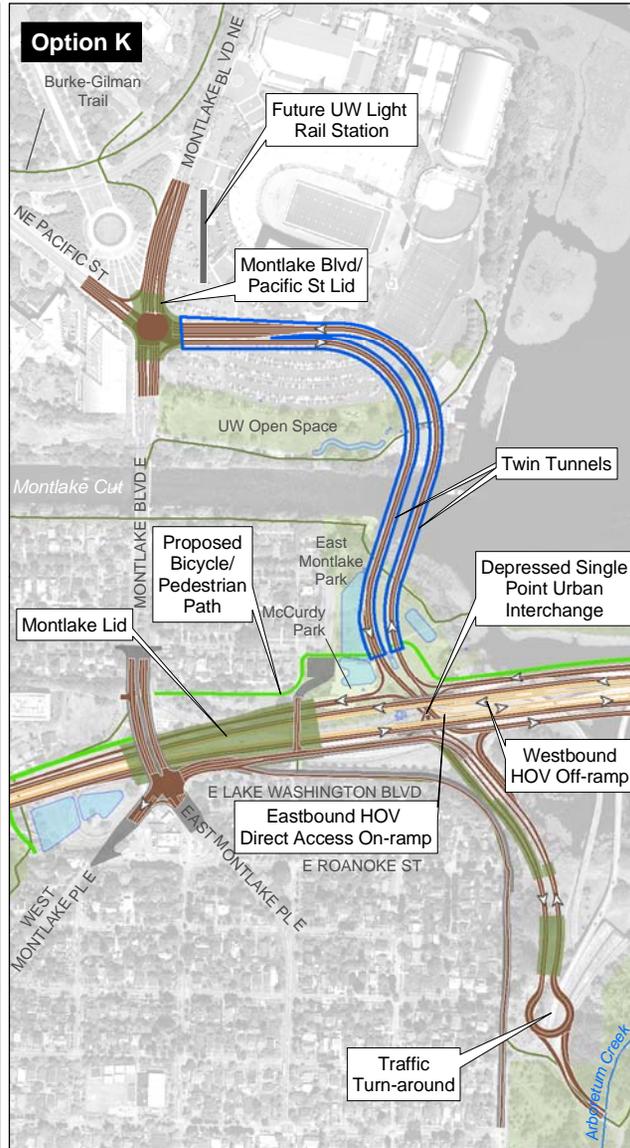
Seattle

Elements Common to the 6-Lane Alternative Options

SR 520 would connect to I-5 in a configuration similar to the way it connects today. Improvements to the I-5/SR 520 interchange would include a new reversible HOV ramp connecting the new SR 520 HOV lanes to existing I-5 reversible express lanes. WSDOT would replace the Portage Bay Bridge and the Evergreen Point Bridge (including the west approach and floating span), as well as the existing local street bridges across SR 520. New stormwater facilities would be constructed for the project to provide stormwater retention and treatment. The project would include landscaped lids across SR 520 at I-5, 10th Avenue East and Delmar Drive East, and in the Montlake area to help reconnect the communities on either side of the roadway. The project would also remove the Montlake freeway transit station.

The most substantial differences among the three options are the interchange configurations in the Montlake and University of Washington areas. Exhibit 5 depicts these key differences in interchange





Source: King County (2006) Aerial Photo, King County (2005) GIS Data (Streams), City of Seattle (1994) GIS Data (Bike/Ped Trail), Seattle Bicycle Map (2008) GIS Data (Bike/Ped Trail) CH2M HILL (2008) GIS Data (Park). Horizontal datum for all layers is NAD83(91); vertical datum for layers is NAVD88.



Exhibit 5. Options A, K, and L: Montlake and University of Washington Areas

I-5 to Medina: Bridge Replacement and HOV Project

configurations, and the following text describes elements unique to each option.

Option A

Option A would replace the Portage Bay Bridge with a new bridge that would include six lanes (four general-purpose lanes, two HOV lanes) plus a westbound auxiliary lane. WSDOT would replace the existing interchange at Montlake Boulevard East with a new, similarly configured interchange that would include a transit-only off-ramp from westbound SR 520 to northbound Montlake Boulevard. The Lake Washington Boulevard ramps and the median freeway transit stop near Montlake Boulevard East would be removed, and a new bascule bridge (i.e., drawbridge) would be added to Montlake Boulevard NE, parallel to the existing Montlake Bridge. SR 520 would maintain a low profile through the Washington Park Arboretum and flatten out east of Foster Island, before rising to the west transition span of the Evergreen Point Bridge. Citizen recommendations made during the mediation process defined this option to include sound walls and/or quieter pavement, subject to neighborhood approval and WSDOT's reasonability and feasibility determinations.

Suboptions for Option A would include adding an eastbound SR 520 on-ramp and a westbound SR 520 off-ramp to Lake Washington Boulevard, creating an intersection similar to the one that exists today but relocated northwest of its current location. The suboption would also include adding an eastbound direct access on-ramp for transit and HOV from Montlake Boulevard East, and providing a constant slope profile from 24th Avenue East to the west transition span.

Option K

Option K would also replace the Portage Bay Bridge, but the new

Is it a highrise or a transition span?



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

Today's highrises have two characteristics—large overhead steel trusses and navigation channels below the spans where boat traffic can pass underneath the Evergreen Point Bridge. The new design for the floating bridge would not include overhead steel trusses on the transition spans, which would change the visual character of the highrise. For the SDEIS, highrise and transition span are often used interchangeably to refer to the area along the bridge where the east and west approach bridges transition to the floating bridge.



bridge would include four general-purpose lanes and two HOV lanes with no westbound auxiliary lane. In the Montlake area, Option K would remove the existing Montlake Boulevard East interchange and the Lake Washington Boulevard ramps and replace their functions with a depressed, single-point urban interchange (SPUI) at the Montlake shoreline. Two HOV direct-access ramps would serve the new interchange, and a tunnel under the Montlake Cut would move traffic from the new interchange north to the intersection of Montlake Boulevard NE and NE Pacific Street. SR 520 would maintain a low profile through Union Bay, make landfall at Foster Island, and remain flat before rising to the west transition span of the Evergreen Point Bridge. A land bridge would be constructed over SR 520 at Foster Island. Citizen recommendations made during the mediation process defined this option to include only quieter pavement for noise abatement, rather than the sound walls that were included in the 2006 Draft EIS. However, because quieter pavement has not been demonstrated to meet all FHWA and WSDOT avoidance and minimization requirements in tests performed in Washington State, it cannot be considered as noise mitigation under WSDOT and FHWA criteria. As a result, sound walls could be included in Option K. The decision to build sound walls depends on neighborhood interest, the findings of the Noise Discipline Report (WSDOT 2009c), and WSDOT's reasonability and feasibility determinations.

A suboption for Option K would include constructing an eastbound off-ramp to Montlake Boulevard East configured for right turns only.

Option L

Under Option L, the Montlake Boulevard East interchange and the Lake Washington Boulevard ramps would be replaced with a new, elevated SPUI at the Montlake shoreline. A bascule bridge (drawbridge) would span the east end of the Montlake Cut, from the new interchange to the intersection of Montlake Boulevard NE and NE Pacific Street. This option would also include a ramp connection to Lake Washington Boulevard and two HOV direct-access ramps providing service to and from the new interchange. SR 520 would maintain a low, constant slope profile from 24th Avenue East to just west of the west transition span of the floating bridge. Noise mitigation identified for this option would include sound walls as defined in the Draft EIS.

Suboptions for Option L would include adding a left-turn movement from Lake Washington Boulevard for direct access to SR 520 and



adding capacity on northbound Montlake Boulevard NE to NE 45th Street.

Lake Washington

Floating Bridge

The floating span would be located approximately 190 feet north of the existing bridge at the west end and 160 feet north at the east end (Exhibit 6). Rows of three 10-foot-tall concrete columns would support the roadway above the pontoons, and the new spans would be approximately 22 feet higher than the existing bridge. A 14-foot-wide bicycle/pedestrian path would be located on the north side of the bridge.

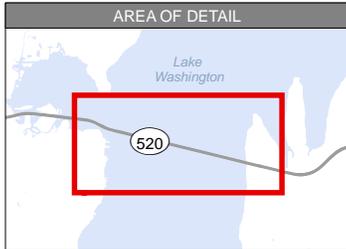
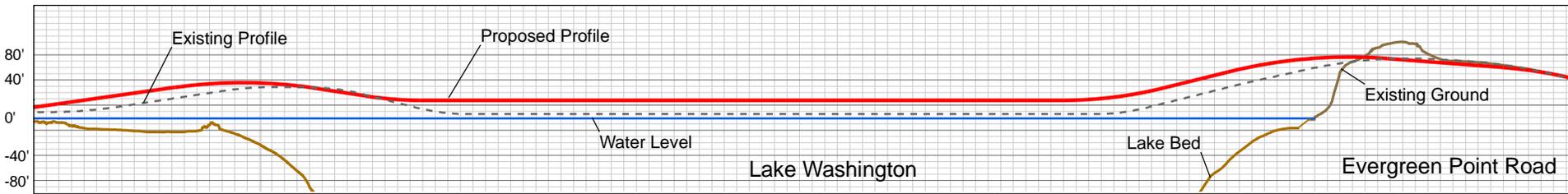
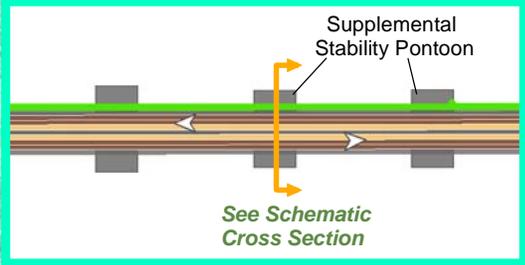
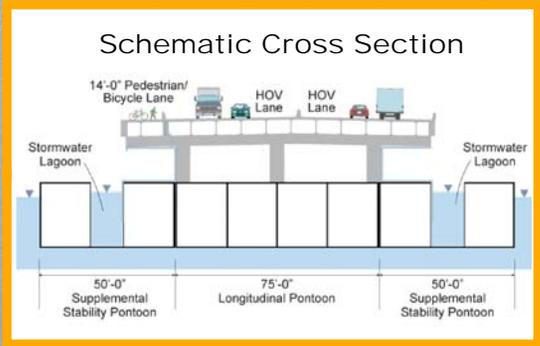
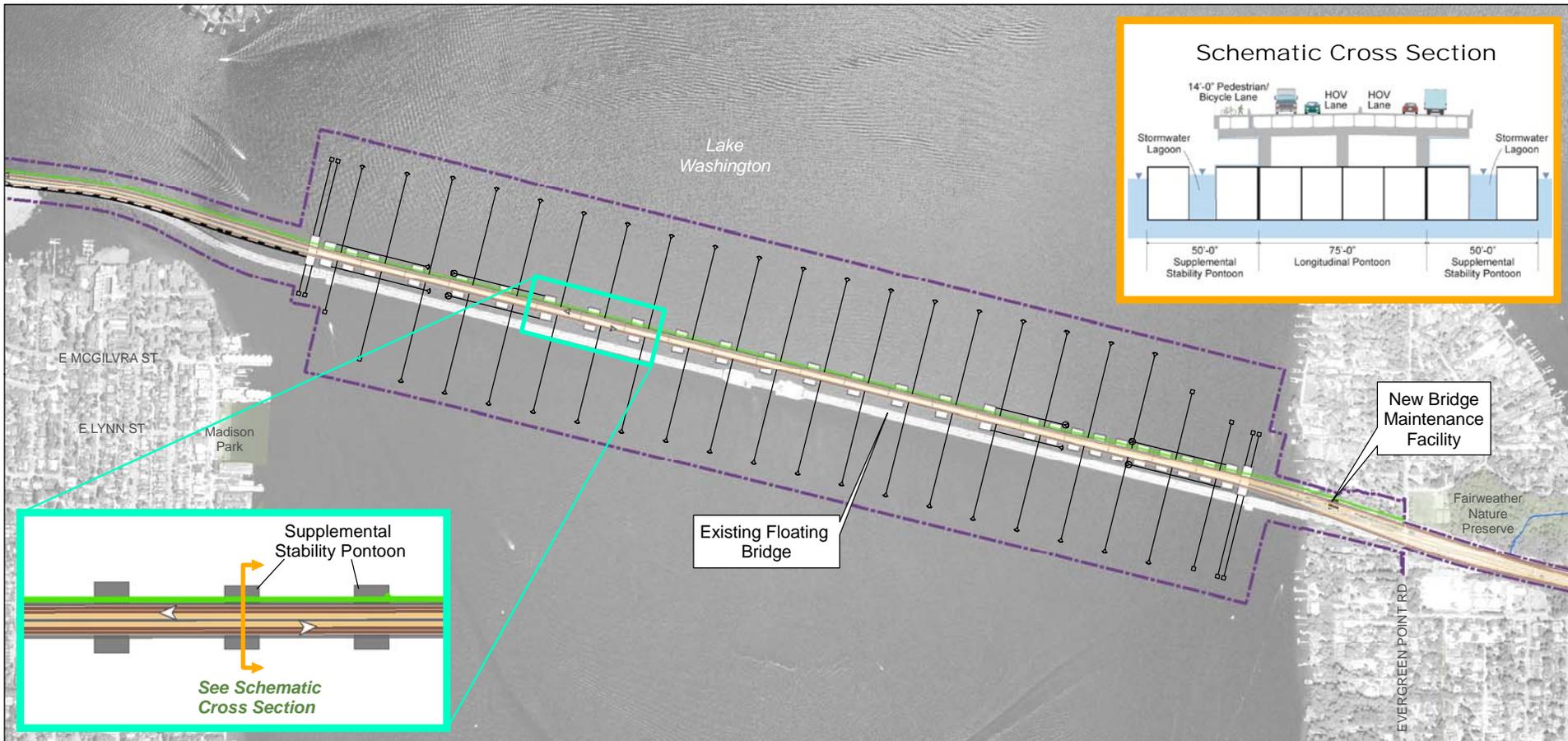
The design for the new 6-lane floating bridge includes 21 longitudinal pontoons, two cross pontoons, and 54 supplemental stability pontoons. A single row of 75-foot-wide by 360-foot-long longitudinal pontoons would support the new floating bridge. One 240-foot-long by 75-foot-wide cross-pontoon at each end of the bridge would be set perpendicularly to the longitudinal pontoons. The longitudinal pontoons would be bolstered by the smaller supplemental stability pontoons on each side for stability and buoyancy. The longitudinal pontoons would not be sized to carry future high-capacity transit (HCT), but would be equipped with connections for additional supplemental stability pontoons to support HCT in the future. As with the existing floating bridge, the floating pontoons for the new bridge would be anchored to the lake bottom to hold the bridge in place.

Near the east approach bridge, the roadway would be widened to accommodate transit ramps to the Evergreen Point Road transit stop. Exhibit 6 shows the alignment of the floating bridge, the west and east approaches, and the connection to the east shore of Lake Washington.

Bridge Maintenance Facility

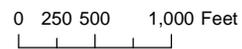
Routine access, maintenance, monitoring, inspections, and emergency response for the floating bridge would be based out of a new bridge maintenance facility located underneath SR 520 between the east shore of Lake Washington and Evergreen Point Road in Medina. This bridge maintenance facility would include a working dock, an approximately 7,200-square-foot maintenance building, and a parking area.





- Anchor and Cable
- Pontoons
- Limits of Construction
- Proposed Bicycle/Pedestrian Path
- General-Purpose Lanes
- HOV, Direct Access, and/or Transit-Only Lane

Park



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

Exhibit 6. 6-Lane Alternative at the Evergreen Point Bridge (Common to All Options)

I-5 to Medina: Bridge Replacement and HOV Project

Eastside Transition Area

The I-5 to Medina project and the Medina to SR 202 project overlap between Evergreen Point Road and 92nd Avenue NE in Yarrow Point. Work planned as part of the I-5 to Medina project between Evergreen Point Road and 92nd Avenue NE would include moving the Evergreen Point Road transit stop west to the lid (part of the Medina to SR 202 project) at Evergreen Point Road, adding new lane and ramp striping from the Evergreen Point lid to 92nd Avenue NE, and moving and realigning traffic barriers as a result of the new lane striping. The restriping would transition the I-5 to Medina project improvements into the improvements to be completed as part of the Medina to SR 202 project.

Pontoon Construction and Transport

If the floating portion of the Evergreen Point Bridge does not fail before its planned replacement, WSDOT would use the pontoons constructed and stored as part of the Pontoon Construction Project in the I-5 to Medina project. Up to 11 longitudinal pontoons built and stored in Grays Harbor as part of the Pontoon Construction Project would be towed from a moorage location in Grays Harbor to Puget Sound for outfitting (see the sidebar to the right for an explanation of pontoon *outfitting*). All outfitted pontoons, as well as the remaining pontoons stored at Grays Harbor would be towed to Lake Washington for incorporation into the floating bridge. Towing would occur as weather permits during the months of March through October. Exhibit 7 illustrates the general towing route from Grays Harbor to Lake Washington, and identifies potential outfitting locations.

What is Outfitting?

Pontoon outfitting is a process by which the columns and elevated roadway of the bridge are built directly on the surface of the pontoon.

The I-5 to Medina project would build an additional 44 pontoons needed to complete the new 6-lane floating bridge. The additional pontoons could be constructed at the existing Concrete Technology Corporation facility in Tacoma, and/or at a new facility in Grays Harbor that is also being developed as part of the Pontoon Construction Project. The new supplemental stability pontoons would be towed from the construction location to Lake Washington for incorporation into the floating bridge. For additional information about pontoon construction, please see the Construction Techniques Discipline Report (WSDOT 2009d).





Exhibit 7. Possible Towing Route and Pontoon Outfitting Locations

Would the project be built all at once or in phases?

Revenue sources for the I-5 to Medina project would include allocations from various state and federal sources and from future tolling, but there remains a gap between the estimated cost of the project and the revenue available to build it. Because of these funding limitations, there is a strong possibility that WSDOT would construct the project in phases over time.

If the project is phased, WSDOT would first complete one or more of those project components that are vulnerable to earthquakes and windstorms; these components include the following:

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



- The west approach of the Evergreen Point Bridge, which is vulnerable to earthquakes (see comments above for the Portage Bay Bridge).

Exhibit 8 shows the vulnerable portions of the project that would be prioritized, as well as the portions that would be constructed later. The vulnerable structures are collectively referred to in the SDEIS as the Phased Implementation scenario. It is important to note that, while the new bridge(s) might be the only part of the project in place for a certain period of time, WSDOT’s intent is to build a complete project that meets all aspects of the purpose and need.

The Phased Implementation scenario would provide new structures to replace the vulnerable bridges in the SR 520 corridor, as well as limited transitional sections to connect the new bridges to existing facilities. This scenario would include stormwater facilities, noise mitigation, and the regional bicycle/pedestrian path, but lids would be deferred until a subsequent phase. WSDOT would develop and implement all mitigation needed to satisfy regulatory requirements.

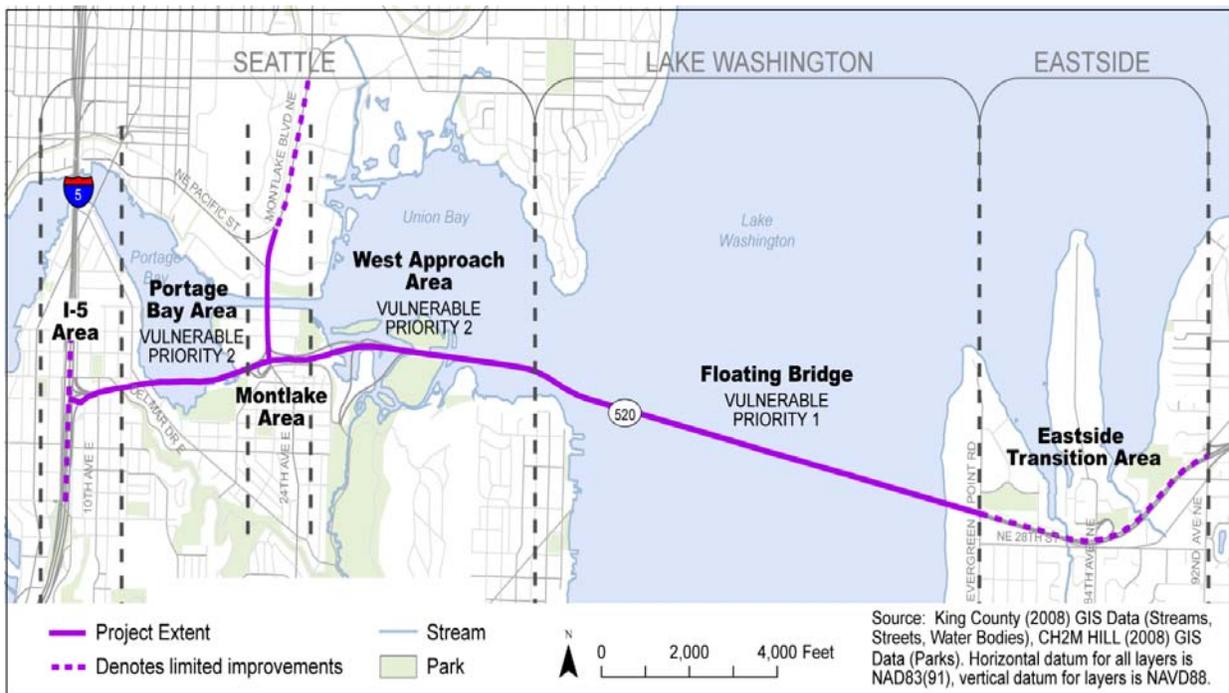


Exhibit 8. Geographic Areas along SR 520 and Project Phasing

To address the potential for phased project implementation, the SDEIS evaluates the Phased Implementation scenario separately as a subset of the “full build” analysis. The evaluation focuses on how the effects of



phased implementation would differ from those of full build and on how constructing the project in phases might have different effects from constructing it all at one time. Impact calculations for the physical effects of phased implementation (for example, acres of wetlands and parks affected) are presented alongside those for full build where applicable.



Affected Environment

What is the study area and how was it selected?

The study area for the social elements is defined as the portions of the neighborhoods adjacent to the SR 520 corridor from I-5 across Lake Washington to the Evergreen Point Road in Medina within 0.5 mile of the proposed project's construction limits. As shown in Exhibit 9, the study area includes portions of the Eastlake, Portage Bay/Roanoke, North Capitol Hill, Montlake, University District, Laurelhurst, and Madison Park neighborhoods in Seattle and a small portion of the City of Medina on the east side of Lake Washington. Exhibit 9 also shows social elements in the study area. The social analysis focused on neighborhoods adjacent to the proposed improvements on SR 520 that could be positively or negatively affected by construction and operation of the project. The social analyst reviewed the neighborhood characteristics and identified community services within the study area radius. Community services include schools, religious institutions, social institutions, government facilities, fire and emergency medical, police, and utilities. There are no cemeteries or defense institutions in the study area.

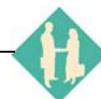
Proposed improvements for the project elements that extend eastward from Evergreen Point Road to 92nd Avenue NE would consist only of restriping and realigning traffic barriers. These improvements would affect only services that travel SR 520 and would have no effect on adjacent neighborhoods; therefore, the social analyst reviewed the area within the WSDOT right-of-way along SR 520 for these project elements.

Neighborhoods in the Study Area

The study area includes portions of several neighborhoods, described in the following sections.

Eastlake

The Eastlake neighborhood is located west of I-5 and was divided from the rest of the study area by the construction of I-5 in the 1950s. The neighborhood consists of older single-family residences and



multifamily apartments and condominiums. Most commercial establishments are located along Eastlake Avenue, which traverses the center of the neighborhood. Commercial businesses consist of small retail stores, restaurants, and office space. Additional information on Eastlake and the community council can be found at www.eastlakeseattle.org.

Portage Bay/Roanoke

The Portage Bay/Roanoke neighborhood is almost completely residential, a remnant of a larger residential area that was divided by construction of I-5 and SR 520 in the 1950s and 1960s. There are areas of commercial businesses, mainly small retail stores and restaurants. Roanoke Park lies near I-5 on East Roanoke Street, surrounded by stately homes in the potential Roanoke Park Historic District. Fuhrman Avenue East and Boyer Avenue East connect this neighborhood to the Montlake neighborhood and provide access to SR 520; East Lynn Street connects to I-5. Additional information on Portage Bay/Roanoke and the community council can be found at www.fabnia.org.

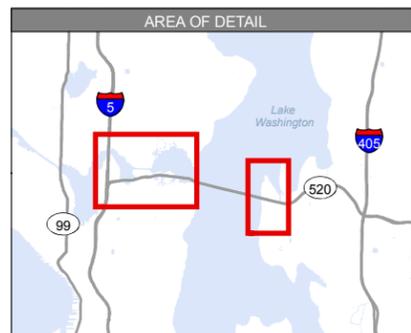
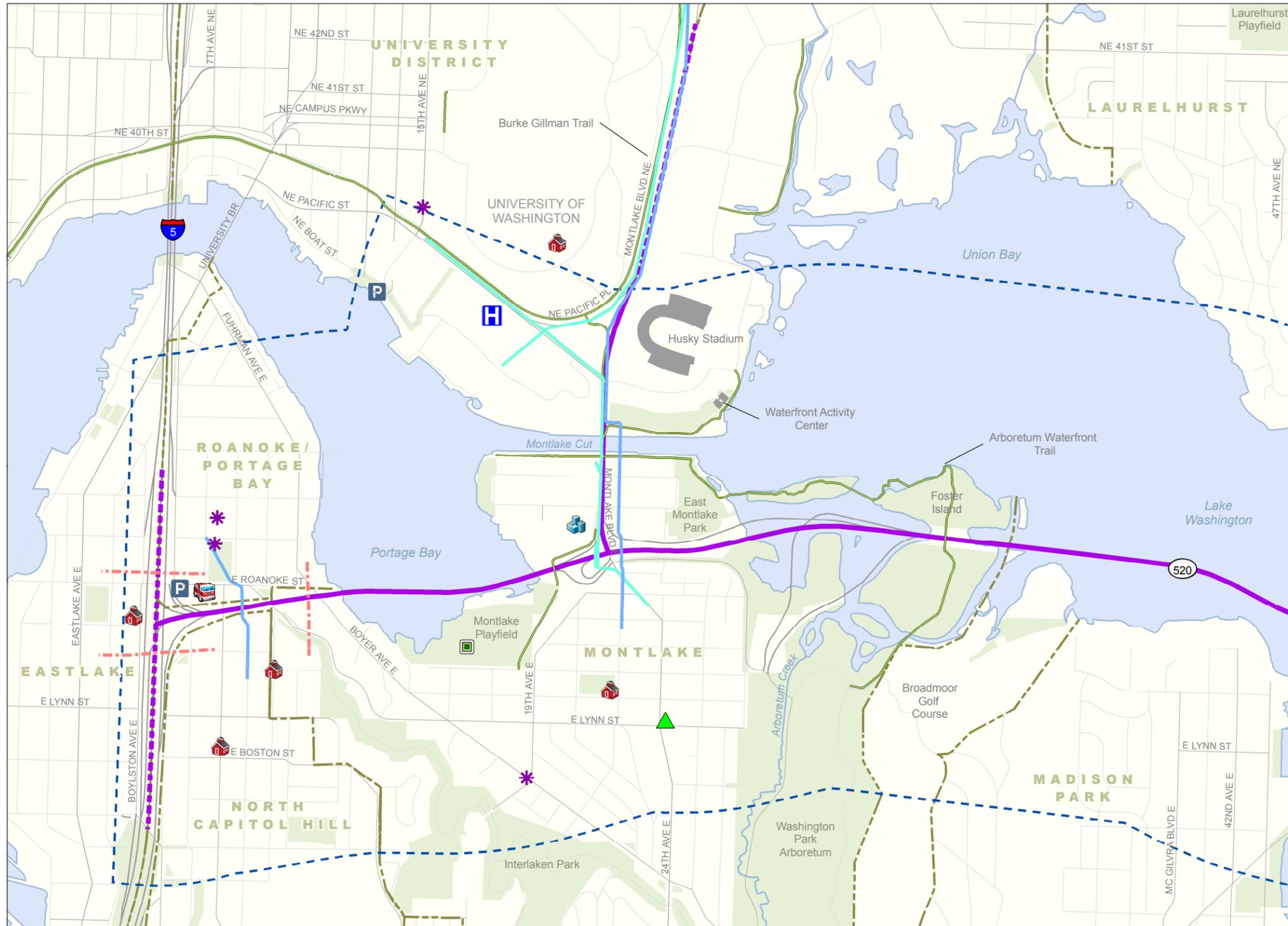
North Capitol Hill

North Capitol Hill is a densely populated urban neighborhood made up of single-family and multifamily residential areas and storefront commercial streets. Tenth Avenue East is the major north-south arterial, providing access to I-5 and SR 520, and East Aloha Street runs east-west, connecting 10th Avenue East with 24th Avenue East. Additional information on North Capitol Hill and the community council can be found at www.nchna.com.

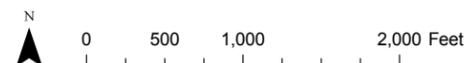
Montlake

The Montlake neighborhood, with its tree-lined streets, nestles between the waters of Portage Bay and the Washington Park Arboretum. The homes in this residential area were built primarily in the first two decades of the 20th century. The Montlake neighborhood is also a potential historic district eligible for listing on the National Register of Historic Places. Before SR 520 was built, this neighborhood formed a unified whole. Now, SR 520 isolates a small, mostly residential portion of Montlake that includes the Seattle Yacht Club and NOAA Northwest Fisheries Science Center. MOHAI also lies north of SR 520, connected only by the 24th Avenue East bridge. Montlake Playfield, McCurdy Park, East Montlake Park, and the Washington Park Arboretum encircle the neighborhood and provide substantial public open space.





- | | | | |
|---------------------------|-------------------|-----------------------|--------------------------------|
| Montlake Community Center | School | Social Study Area | Main Feeder Telephone Line |
| Montlake Library | Fire | Construction Extent | Water Main Line |
| Religious Institution | Police | Limited Improvement | Major Sewage Conveyance System |
| Government Building | UW Medical Center | Neighborhood Boundary | Shared Use Pathway/Trail |
| | Park | | |



Source: City of Bellevue (1999) City Limits, King County (2005) GIS Data (Streams and Streets), King County (2007) GIS Data (Water Bodies), Qwest (2002) GIS Data (Main Feeder Telephone Line), City of Seattle (1999) GIS Data (Structures), City of Seattle (2008) GIS Data (Sewer and Water Mainlines), City of Seattle (1997) GIS Data (Neighborhood District), CH2M HILL (2008) GIS Data (Park and Points of Interest). Horizontal datum for all layers is NAD83(91); vertical datum for layers is NAVD88.



Exhibit 9. Social Elements and Study Area

I-5 to Medina: Bridge Replacement and HOV Project

Montlake Boulevard East/24th Avenue East is the main arterial, connecting Montlake to the University of Washington, SR 520, and downtown neighborhoods in Seattle. Additional information on Montlake and the community council can be found at www.montlake.net.

University District

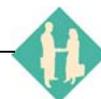
Densely developed with campus buildings, housing, and businesses to support its large student population, employees, and residents, the University District lies north of Portage Bay and west of Union Bay. Montlake Boulevard NE fronts the University's sports complexes. University of Washington Medical Center on NE Pacific Street is located at the south end of the neighborhood, and the University campus itself, with its mix of neo-Gothic and modern architecture and its large landscaped areas, serves as a major open space. Bicyclists and pedestrians from throughout the region use the Burke-Gilman Trail, which runs along Montlake Boulevard NE and NE Pacific Street. Additional information on University District can be found at www.udistrictchamber.org.

Laurelhurst

Laurelhurst is located north of SR 520 on the west side of Union Bay. The portion of Laurelhurst located in the study area consists of single-family homes that occupy a south-facing hillside on a peninsula that juts into Lake Washington. Many of the residents enjoy views of the lake, the Evergreen Point Bridge, and Mount Rainier. Laurelhurst's commercial areas and areas of other social elements are located outside of the study area. Additional information on Laurelhurst and the community council can be found at www.laurelhurstcc.com.

Madison Park

The residential neighborhood of Madison Park lies south of Union Bay and west of Lake Washington. Its west side encompasses the gated Broadmoor community, which includes the Broadmoor Golf Club and large residences. The portion of Madison Park in the study area includes shops, restaurants, and multifamily buildings near the lakeshore at the northern end of East Madison Street. At the southern end of the neighborhood, Lake Washington Boulevard East intersects East Madison Street and runs east through the Washington Park Arboretum to provide access to SR 520. Additional information on



Madison Park and the community council can be found www.madisonparkcouncil.org.

How was the information collected?

The social analyst collected information from a variety of federal, state, and local sources and conducted the following activities to identify the proposed project's potential effects:

- Visited the study area to characterize the current neighborhood environment.
- Reviewed data from federal, state, county, and local agencies, including the U.S. Census Bureau, Puget Sound Regional Council, Washington State Office of Financial Management (2008), and the jurisdictions of Seattle and Medina.
- Reviewed existing documentation, including comprehensive plans and other planning documents, relevant Web sites, and geographic information system (GIS) and other maps to identify community services, recreational resources, and existing and planned pedestrian, bicycle, and transit facilities in the study area.
- Reviewed design drawings to determine the locations of any large or distribution utility lines that would potentially be affected by the project.
- Created GIS maps to identify the locations of social elements in the study area.
- Reviewed public input on the project.

How has the community been involved in the project?

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 that started with 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 Agency Coordination and Public Involvement Discipline Report (WSDOT 2009e). 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.

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, and improve and expand the HOV and bus system. Activities in the last 2 years included a Westside mediation 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 Web sites, monthly email updates, media outreach, and information kiosks at strategic public locations.

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

Four principal constituencies have been an integral part of the public involvement effort: the general public; minority, low-income, and LEP populations; elected officials and jurisdictions; and a Westside mediation stakeholder group.

General Public

WSDOT strives to keep the broader general public informed and engaged, while continuing to target several key audiences for public outreach, including local neighborhoods, commuters, and special interest groups. Methods for involving the public include the following:

- Sharing updated project information, including project and program Web sites, email updates, media press releases, and informational displays placed in strategic locations
- Hosting public meetings and providing briefings to existing community groups



- Staffing information booths at events such as public fairs, farmers' markets, festivals, and events to broaden involvement beyond those who choose to attend public meetings

Targeted neighborhoods have included those that would be affected by the construction and operation of the new SR 520 facility, including Madison Park, North Capitol Hill, Eastlake, Portage Bay/Roanoke Park, Montlake, University District, Ravenna Bryant, and Laurelhurst. WSDOT has also targeted commuters who use the SR 520 corridor to travel via bus or car between Seattle and the Eastside, businesses and consumers who rely on the SR 520 corridor to move goods and provide services, and advocacy groups (such as bicycle, environmental, and neighborhood organizations).

Public Meetings

The project team has hosted six public meetings since publication of the Draft EIS (WSDOT 2006), including two public hearings and four additional open houses. The two public hearings were included in the Draft EIS (WSDOT 2006) comment period (August 18 to October 31, 2006) as an opportunity for the public to discuss project information with WSDOT project team members and submit comments on the environmental document. Open houses provided an informal setting for the public to obtain information, meet the mediation facilitators and participants, make comments, and speak directly with project team members. Informational boards and handouts were available at all public meetings to provide details on various topics, and project representatives and technical specialists were present to explain project elements and answer questions. All public meeting materials were also posted on the program Web site following the events.

At all public meetings, participants were encouraged to provide feedback about the project. The public could fill out supplied comment cards or, following the meetings, provide comments via email, mail, or phone. After each round of meetings, the project team developed public input summaries to share with the project team and post to the program Web site. Comments received during the official Draft EIS (WSDOT 2006) comment period will be addressed in the Final EIS.

Community Briefings

The project team initiated and responded to requests for community and jurisdictional briefings as a proactive way to extend the reach of the traditional "speaker's bureau." The project team identified and



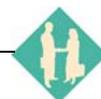
approached groups such as professional organizations, neighborhood and business associations, minority associations, and faith-based organizations. These targeted groups were asked to host meetings for their constituencies and other related groups, or to host a speaker from the project at a regularly scheduled meeting. These meetings were located in easily accessible community venues. By reaching out to and working with community organizations, the project team met with community members who otherwise might not have attended project events.

Since publication of the Draft EIS (WSDOT 2006) in August 2006, 32 briefings have been held with various community groups. Many of these groups have met with the project team multiple times, as new information has become available. At each briefing, WSDOT typically provided project updates and offered attendees the opportunity to comment and ask questions. The project team recorded and tracked community comments received during these briefings and any related action items for follow-up. The Agency Coordination and Public Involvement Discipline Report (WSDOT 2009e) describes the community briefings held since August 2006

Community Events and Outreach

The project team attended community events planned by other organizations to reach a broader group of community members. At events such as summer fairs and festivals (which attract large crowds of people who may not attend a project open house) hundreds of participants visited the project booth to pick up information, sign up for project mailings, and talk to members of the project team. These events provided a convenient and informal opportunity for community members to learn about and provide comments on the project.

As described in the SR 520 Corridor Program: 2008 Fairs and Festivals Year-end Report (WSDOT 2009f), since 2005, WSDOT project team members have participated in more than 140 events, reaching more than 24,500 citizens through 2008. The Agency Coordination and Public Involvement Discipline Report (WSDOT 2009e) lists Seattle-area community events since publication of the Draft EIS. Similar briefings that have been held on the Eastside are discussed in the environmental documentation for the Medina to SR 202: Eastside Transit and HOV Project Public Involvement report (WSDOT 2009g).



Minority, Low-Income, and Limited-English-Proficient Populations

Project outreach includes methods to engage members of communities that historically have been under-represented in public involvement processes.

To ensure that the process was inclusive and complied with federal environmental justice guidance, the project team conducted specific outreach to minority, low-income, and LEP populations. The project team analyzed U.S. Census (2000) and demographic data to determine which under-represented communities are in or near the study area. The project team supplemented these data by interviewing community leaders to refine the outreach strategies for engaging minority, low-income, and LEP populations.

In response to the anecdotal findings received from interviews and other information garnered through the outreach process, the public involvement plan was expanded to ensure broad-reaching participation throughout the project vicinity. Refer to the Environmental Justice report for additional information (WSDOT 2009a).

More recently, WSDOT has engaged environmental justice communities as part of a new tolling project in the SR 520 corridor. In March 2009, WSDOT published the SR 520 Variable Tolling Project Environmental Assessment (WSDOT 2009h). This document raised important questions about effects on environmental justice populations. WSDOT conducted outreach to environmental justice populations by completing additional demographic analyses, surveying Evergreen Point Bridge users, conducting focus groups and Spanish-language telephone interviews with Evergreen Point Bridge users, and implementing other public involvement activities. Additional information about these outreach efforts can be found in the Environmental Justice report (WSDOT 2009a). Public involvement and outreach to minority, low-income, and LEP populations will continue through the duration of the project.

Limited-English Proficiency

Individuals who do not speak English as their primary language and who have a limited ability to read, speak, write, or understand English, are considered to be LEP. These individuals may be entitled to language assistance in certain circumstances. Federal laws that are particularly applicable to language access include Title VI of the Civil Rights Act of 1964 and the Title VI regulations prohibiting discrimination based on national origin, as well as Executive Order 13166 issued in 2000. (WSDOT 2008).

Elected Officials and Jurisdictions

The project team maintained a proactive and responsive relationship with elected officials and jurisdictions, including federal, state, and local governments. Outreach efforts effectively connected the project team with elected representatives and their staffs, including the Office of the Governor, key Washington state legislators, the Mayor of Seattle,



and the Seattle City Council. The project team also extended offers to brief jurisdictional leaders and their staffs. Elected officials and jurisdictional staff were provided with project updates near key milestones to support the decision-making process. The Agency Coordination and Public Involvement Discipline Report (WSDOT 2009e) identifies the project team's meetings with elected officials and jurisdictions.

Westside Mediation Stakeholder Group

In 2007, the Washington State Legislature passed ESSB 6099. The bill directed the Office of Financial Management to hire a mediator and appropriate planning staff to develop a 6-lane corridor interchange design for the Montlake area. The mediation group was also directed to create a project impact plan to address effects of the project on Seattle neighborhoods and parks. The WSDOT project team engaged with a mediated stakeholder group between September 2007 and December 2008.

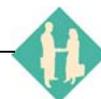
The targeted audiences for the Westside mediation process were Seattle neighborhoods and the organizations and jurisdictions directly affected by SR 520 construction and operation. The group focused on design options for the Westside interchange and their effects on neighborhoods, quality of life, traffic, and the environment. Participants also considered potential effects on the Washington Park Arboretum and the University of Washington.

Mediation participants were identified through interviews with a broad range of stakeholder organizations, including those identified in the legislation and others who had been actively involved with the project team. Refer to the Agency Coordination and Public Involvement Discipline Report for more information (WSDOT 2009e).

Mediation Results

Over the course of the Westside mediation process, the project team participated in 17 large-group mediation and mediation technical work sessions and 16 additional mediation proponent group meetings. The mediation participants developed and reviewed more than a dozen design options (A through L) for configuring SR 520 through Seattle.

During 2008 the design options were narrowed to Options A, K, and L, and in June 2008, WSDOT invited the proponents of each design option to join the project team at the two public open houses to receive



answers to questions about the design options and the Westside mediation process.

WSDOT continued to engage with the mediation group through December 2008, participating in mediation proponent group meetings, project impact plan work sessions, lid programming group meetings, expert review panels, and the Executive Oversight Committee. The input received at these meetings was used to develop the SDEIS alternatives. Refer to the Agency Coordination and Public Involvement Discipline Report for more information (WSDOT 2009e).

What are the existing social characteristics of the study area?

The study area includes portions of seven neighborhoods within Seattle – Eastlake, North Capitol Hill, Portage Bay/Roanoke, University District, Montlake, Madison Park, and Laurelhurst – and a portion of Medina, described above. The social analyst reviewed the neighborhood characteristics and identified the community services within these neighborhoods. The following social elements were analyzed for this evaluation:

- Community cohesion
- Population characteristics
- Regional and community growth
- Recreation facilities
- Community services
- Pedestrian, bicyclist, and transit resources

These social elements are described below for the study area along the SR 520 corridor, for the Eastside transition area, and for pontoon production and transport. Because there are no social elements associated with Lake Washington, it is not discussed in the Affected Environment section.

SR 520 Corridor

Seattle

Community Cohesion

The proposed project is located within the city limits of Seattle. Seattle is the largest city in Washington and is a major employment center in the Puget Sound region. The study area includes the

Community Cohesion

The ability of people to communicate and interact with each other in ways that lead to a sense of community, as reflected in the neighborhood's ability to function and be recognized as a singular unit.



portion of the SR 520 corridor traveling eastbound from I-5 through or adjacent to the neighborhoods of Eastlake, Portage Bay/Roanoke, North Capitol Hill, Montlake, Madison Park, and Laurelhurst, then crossing Lake Washington and ending at Evergreen Point Road in Medina.

The study area north and south of SR 520 consists primarily of urban residential neighborhoods or recreation facilities. Within the study area boundaries, the University District neighborhood is primarily associated with the main University of Washington Campus, including its athletic facilities and Medical Center.



Neighborhood streets in the Portage Bay/Roanoke and Montlake neighborhoods.

The neighborhoods in the study area are well established, with many older homes having mature landscaping and limited land for any new development. The neighborhoods are all very walkable with tree-lined streets containing sidewalks on at least one side of the street. Many of the neighborhoods have residential parking zones that limit who is allowed to park on streets and the time duration. These zones are meant to protect the residential neighborhoods from traffic congestion and negative parking effects.

Within the neighborhoods are traffic calming devices at intersections and crosswalks. Neighborhood parks exist in most of the neighborhoods in the study area (see Exhibit 9), and many of the neighborhoods have commercial areas that include businesses that typically cater to neighborhood residents (e.g., small markets, coffee



Neighborhood commercial area in the Montlake neighborhood.



shops, restaurants, hair salons) and provide the residents opportunities to engage socially with one another. Additionally, there are other places, such as religious institutions, community centers, libraries, and recreation facilities, in the study area where area residents can gather to interact with one another.

The area is well-connected to the surrounding transportation network. SR 520 is the primary travel route in the study area.

The highway provides access to the large employment centers of downtown Seattle and downtown Bellevue, as well as access to I-5 and I-405. Streets that are classified as arterials typically have busier traffic than non-arterial streets and tend to have local bus routes that provide links within the neighborhoods and to other neighborhoods in Seattle. Paved pathways, including the Montlake Bike Path and Burke Gilman Trail, that pedestrians and bicyclists can use to travel through the neighborhoods and to other areas within Seattle, also provide community cohesion.

Population Characteristics

The social analyst used U.S. Census tract block group data to compare the study area population characteristics with those of the larger geographic areas of Seattle and King County. As indicated in Exhibit 10, the population in the study area has a higher median age compared to the larger geographic areas, but the percentage of the population over the age of 65 is similar. The study area also has a much higher median household income, almost two times that of Seattle as a whole, and it has a relatively small percentage of the population at or below the poverty level. More of the residents are homeowners, with a low percentage of households with no vehicle (U.S. Census 2000). These data are likely indicators of the low percentages of individuals and householders below the poverty level.

What is a Census Tract Block Group?

A subdivision of a Census tract, a block group consists of all the blocks within a Census tract with the same beginning number. In urban areas, a block group typically encompasses two to four city blocks.

The data in Exhibit 10 also indicate that most of the residents in the study area either speak English very well or well. To look for any changes in the population characteristics and to help determine if outreach is being done in the correct languages, the social analyst reviewed public school data for elementary schools in the study area. The analyst used data from two Seattle public elementary schools because of the availability of LEP data and because the attendance boundaries closely resemble the study area. According to information on the Seattle Public Schools Web site for the 2008-2009 school year, 2 of



the 237 students (0.8 percent) who attended Montlake Elementary and 3 of the 250 students (1.2 percent) who attended McGilvra are considered

Exhibit 10. Population Characteristics

Characteristic	Study Area	Seattle	King County
Total Population	17,049	563,374	1,737,034
Median Age (years)	38.5	35.4	35.7
People over 65 Years of Age	11.2%	12.0%	10.5%
Owner-Occupied Housing	59.3%	48.4%	59.8%
Renter-Occupied Housing	40.7%	51.6%	40.2%
Median Household Income	\$84,054	\$45,736	\$53,157
Households at or below Poverty Level	5.5%	10.7%	7.8%
Individuals at or Below Poverty Level (of the population for which poverty status is determined)	4.8%	11.8%	8.4%
Average Household Size	2.02	2.08	2.39
Households with No Vehicle	5.8%	16.3%	9.3%
Persons with Disability (population 5 years and older)	9.9%	16.2%	16.1%
LEP Populations (population 5 years and older)	0.9%	20.2%	18.4%

Source: U.S. Census (2000).

LEP (Seattle Public Schools 2009). At both schools, the Asian population accounted for the greatest percentage of minority students. This may indicate that since the 2000 Census, the LEP population has remained almost the same within the study area. The Environmental Justice Discipline Report (WSDOT 2009a) includes additional information on student demographics.

Regional and Community Growth

As shown in Exhibit 11, the population is estimated to have increased in Seattle and King County overall but has decreased in Medina since 2000.

Exhibit 11. Population Forecast

City/Town/County	2000	2008 (Estimate)	Change in Population
Medina	3,011	2,955	-56 (-1.9%)
Seattle	563,374	592,800	29,426 (5.2%)
King County	1,737,034	1,884,200	147,166 (8.5%)

Source: Office of Financial Management (2008).



Recreation Facilities

Exhibits 9 and 12 identify the parks, open spaces, and trails located in the study area. Recreational resources include small street triangles with no facilities and neighborhood parks with play areas and picnic tables, as well as the Washington Park Arboretum, a regional destination that is more 190 acres in size and includes trails, outdoor shelters, the Japanese Garden, and the Graham Visitors Center. In addition to these facilities, there are paved pathways, such as the Montlake Bike Path that provides access across SR 520 and the Burke-Gilman Trail, which is a regional trail that travels from Ballard through the University District and Laurelhurst neighborhoods around the northern tip of Lake Washington and connects with the Sammamish River Trail. These pathways provide recreation opportunities for pedestrians and bicyclists.

Exhibit 12. Recreation Facilities

Name	Neighborhood	Size	Type and/or Function
Rogers Playfield	Eastlake	1.9 acres	Neighborhood park
Roanoke Park	Portage Bay/Roanoke	2.2 acres	Neighborhood park
Bagley Viewpoint	Portage Bay/Roanoke	0.15 acre	Viewpoint park
Interlaken Park	Montlake	51.7 acres	Regional park
Montlake Playfield	Montlake	27.0 acres	Neighborhood park
Montlake Bike Path (Bill Dawson Trail)	Montlake	N/A	Connection bicycle path
McCurdy Park	Montlake	1.5 acres	Neighborhood park, also includes southern half of MOHAI building
East Montlake Park	Montlake	7.1 acres	Neighborhood park, also includes northern half of MOHAI building
Washington Park Arboretum	Montlake	193.3 acres	Arboretum, includes Arboretum Waterfront Trail
Lake Washington Boulevard	Montlake	N/A	Planter strip
Ship Canal Waterfront Trail	Montlake	N/A	Paved pathway
University of Washington Waterfront Activity Center	University District	N/A	Canoe and rowboat rentals
Burke-Gilman Trail	University District	N/A	Regional paved pathway



Recreation facilities provide numerous opportunities for residents in the study area to enjoy the green space and amenities found at the facilities; they also provide space for residents to connect socially. In addition to the facilities identified in Exhibit 12, the planter strips located along Lake Washington Boulevard and Montlake Boulevard NE are also considered recreation facilities; however, the purpose of these facilities is to provide a visual experience. For more information about the recreation facilities in the study area, see the Recreation Discipline Report (WSDOT 2009i).

Community Services

Community services include schools, religious institutions, social institutions, government facilities, fire and emergency medical, police, and utilities. These services are discussed below. No cemeteries or defense institutions are located within the study area.

Schools

There are five schools located in the study area – two public, two private, and a post-secondary school. Schools in the study area are listed in Exhibit 13 and their locations are shown in Exhibit 9.

Exhibit 13. Schools in the Study Area

School Name	Neighborhood	Address	City	Grades	Public/Private
TOPS School	Eastlake	2500 Franklin Avenue East	Seattle	K – 8	Public
Bertschi School	North Capitol Hill	2227 10th Avenue East	Seattle	PK – 5	Private
Seattle Preparatory School	Montlake	2400 11th Avenue East	Seattle	9 – 12	Private
Montlake Elementary	Montlake	2409 22nd Avenue East	Seattle	K – 5	Public
University of Washington	University District		Seattle	Post-secondary	Public

K = kindergarten
PK = prekindergarten

Religious Institutions

There are four churches and cathedrals of various denominations in the study area: the Saint Patrick’s Catholic Church at 2702 Broadway East and the Vedanta Society of Western Washington at 2716 Broadway East in Portage Bay/Roanoke neighborhood; the Saint Demetrios Greek Orthodox Church at 2100 Boyer Avenue East in the Montlake neighborhood; and the Church of Jesus Christ of Latter Day Saints at 3925 15th Avenue NE in the University District. Exhibit 9 shows religious facilities in the study area.



Social Institutions

There are two social institutions in the study area, both located in the Montlake neighborhood: the Montlake Community Center (1618 East Calhoun Street) at the south end of Montlake Park and the Seattle Public Library Montlake Branch (2401 24th Avenue East). These facilities are shown in Exhibit 9. The Seattle Parks and Recreation Department operates the Montlake Community Center, which offers an array of programs and special events for all ages, such as martial arts, dancing, and senior programs. The Montlake Branch library opened in 2006 and offers computers and a meeting room for public use.

What are social institutions?

Social institutions are those public and private facilities such as community centers and fraternal organizations that provide programs and places to meet socially for area residents.

Government Facilities

The only government facility in the study area is a U.S. Department of Commerce facility located immediately north of the SR 520 corridor at 2725 Montlake Boulevard East in the Montlake neighborhood, as illustrated in Exhibit 9. This facility houses the NOAA Northwest Fisheries Science Center, also known as the Montlake Laboratory, and more than 350 staff and 35 specialized research laboratories. The center studies marine resources and their habitats in the waters off the coasts of Washington and Oregon, as well as rivers and streams in Northwest states through five field research stations. The NOAA Northwest Fisheries Science Center leads the ongoing salmon recovery efforts in the Pacific Northwest.



Montlake Community Center

Fire and Emergency Medical

Seattle Fire Department Station #22 is located within the Portage Bay/Roanoke neighborhood at 901 East Roanoke Street and is the only fire station in the study area. Average response time for the fire department is 4.32 minutes (Seattle Fire Department 2009). The Seattle Fire Department plans to rebuild Fire Station #22 because of its inadequate size and outdated building. The plan is to double the footprint of the existing station. The existing functions would be moved to an interim location during the station reconstruction period. Facility upgrades have been delayed until the effects of the I-5 to Medina: Bridge Replacement and HOV Project on the property have been determined (Christina Faine, Fire Levy Communications



Seattle Fire Department Station #22



Officer, Capital Programs Division, Seattle, Washington. May 21, 2009. Personal communication).

Other fire stations that respond to calls in the study area include Station #17 in the University District (1050 NE 50th Street) and Station #34 in Madison Park (633 32nd Avenue East). The Seattle Fire Department also includes two fireboats as part of its Marine Program. The Leschi is stationed at Station #5 on Elliott Bay, and Engine One is stationed at Fishermen's Terminal in Ballard. Through mutual aid agreements with jurisdictions around Lake Washington, the fireboats can respond to boat or marina fires anywhere on the lake. They can also pump water to support land-based firefighting of structural fires along the shoreline.

The University of Washington Medical Center (1959 NE Pacific Street) located in the University District neighborhood is the only hospital in the study area (Exhibit 9). Harborview Medical Center (325 9th Avenue) is the Level 1 Trauma facility for Washington; it is the headquarters for the Seattle Fire Department's Medic One Program and has three of that program's ambulances. The Medic One Program provides paramedics trained in advanced life support skills that in that past were performed only by licensed physicians.

Police

The Seattle Police Department provides law enforcement and responds to calls in Seattle. Seattle is divided into five precinct areas, with the East Precinct (headquartered at 1519 12th Avenue) patrolling and responding to calls in the neighborhoods south of the Montlake Cut, and the North Precinct (10049 College Way North) patrolling and responding to calls in the University District and Laurelhurst neighborhoods.

Two additional law enforcement agencies patrol and respond to calls in the study area. The Washington State Patrol District #2 responds to accidents on these highways and highway on-ramps, off-ramps, and interchanges. The Seattle North Detachment of the Washington State Patrol is located at 811 East Roanoke in the Portage Bay/Roanoke neighborhood, as illustrated in Exhibit 9. The University of Washington Police Department serves and protects the people and property within the main campus of the University. The station is located at 1117 NE Boat Street within the study area, as shown in Exhibit 9.



Utilities

The following sections provide information on utility providers in the study area and include information on major utilities that cross under or over SR 520.

Electricity

The City of Seattle-owned electric utility, Seattle City Light, provides electric power to the neighborhoods in Seattle. A number of overhead and underground distribution lines are located adjacent to SR 520 and I-5 within the study area; however, no major overhead or underground transmission lines cross SR 520 in the study area.

Natural Gas

Puget Sound Energy provides natural gas service to the study area. No high-pressure gas mains are located near SR 520 in the study area.

Telecommunications

Qwest Communications is the principal provider of local telephone services in the study area. Qwest also provides internet service to the study area. Telephone lines are typically located within street rights-of-way, aboveground on utility poles in most areas, and underground in some areas. Main feeder telephone lines cross SR 520 at Boyer Avenue East and cross I-5 approximately at East Roanoke Street and East Miller Street. There are a number of cellular phone providers in the study area, and a cellular tower is located in the Montlake interchange within the study area.

Cable

Two private companies, Comcast and Broadstripe, provide cable television and cable internet service to neighborhoods in the study area.

Water, Wastewater, and Stormwater

Seattle Public Utilities (SPU) provides water service to the neighborhoods in Seattle. Major water mains (larger than 42 inches in diameter) in the study area that cross SR 520 include a 42-inch main that crosses SR 520 between 10th Avenue East and Delmar Drive East and a 54-inch main that crosses SR 520 at Montlake Boulevard NE (Exhibit 9). SPU also manages Seattle's drainage, surface water runoff, and sewer systems. Sewage and stormwater enter combined (i.e., combined sewage and stormwater) system in Seattle and are conveyed through the King County interceptor system to the West Point Treatment Plant, located on Puget Sound. Separate drainage-only systems flow directly to water bodies such as Lake Union, Elliott Bay, and Lake Washington.



The King County Wastewater Treatment Division (KCWTD) provides sewage treatment services in Seattle. Wastewater from the study area flows to the West Point Treatment Plant. Major sewer trunk lines include a 90-inch (KCWTD) main along East Montlake Place East, a 66-inch (City of Seattle) main along West Montlake Place East, a 108-inch (KCWTD) siphon and a 42-inch (KCWTD) gravity sewer along Montlake Boulevard NE under SR 520 (Exhibit 9), a 114-inch (KCWTD) main north to the KCWTD Montlake Regulator, a 48-inch (KCWTD) siphon under the Montlake Cut, and a 48-inch (KCWTD) main along Montlake Boulevard NE and NE Pacific Street. None of these facilities can be moved and must be kept in operation at all times

Stormwater and drainage are discussed in more detail in the Water Resources Discipline Report (WSDOT 2009j).

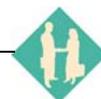
Garbage and Recycling Service

SPU currently has contracts with two private firms for garbage and recycling service in Seattle: Waste Management and CleanScapes. Waste Management provides service outside the study area in south and northwest Seattle. CleanScapes began contracting with the City in March 2009 and serves central and northeast Seattle, including the study area. There are no recycling or transfer/disposal stations located in the study area.

Pedestrian, Bicyclist, and Transit Facilities

The neighborhoods in the study area include a variety of pedestrian, bicyclist, and transit facilities. In addition, the transportation element of *Seattle's Comprehensive Plan Toward a Sustainable Seattle* (City of Seattle 2008) addresses the need for increased choices for pedestrian, bicyclist, and transit facilities throughout the city to help achieve environmental and community goals and reduce the need to use single-occupant vehicles. Although the plan does not identify any specific projects, the policies identified to achieve the goals include improving mobility and safe access for pedestrians and bicyclists, providing opportunities to re-establish connections across I-5, and developing a citywide local transit system that connects homes and businesses with neighborhood transit facilities. Neighborhood plans also address the need for improvements in pedestrian, bicyclist, and transit facilities and include recommendations for projects that could be implemented within the neighborhoods to help to realize the goals.

The following sections describe existing pedestrian, bicyclist, and transit facilities.



Pedestrian

In the Seattle neighborhoods, sidewalks are located along most of the streets and, in most cases, are on both sides of the streets. Crosswalks are located at many of the intersections, with pedestrian-controlled access. In the Seattle neighborhoods, speed limits are low and there are traffic-calming devices and residential parking zones that minimize traffic. The Montlake Bike Path, the Burke-Gilman Trail, and the Arboretum Waterfront Trail provide additional opportunities for pedestrians in the study area. There are no connections between Seattle and the Eastside for pedestrians, so pedestrians must use transit to travel across Lake Washington within the study area.

Bicyclist

Within all parts of the study area, there are limited bicycle-only facilities. Some streets do have bicycle-only lanes or bicycle sharrows (i.e., markings on the roadway that provide a visual cue that bicyclists share the road). On most streets, bicyclists are required to ride with motorized vehicles in the roadway. The Montlake Bike Path and the Burke-Gilman Trail also provide opportunities for bicyclists in the study area. The Lake Washington Loop Route is an identified route around Lake Washington, composed of portions of the Burke-Gilman Trail, local roadways, and other paved pathways. There are no connections between Seattle and the Eastside for bicyclists, who must use transit vehicles with bicycle racks to travel across Lake Washington within the study area.

Transit

King County Metro, Sound Transit, and Community Transit all provide bus service to the study area. There are a number of transit routes in the study area, and the University District is one of the best-served neighborhoods in the region because of the University of Washington. King County Metro, Sound Transit, and Community Transit all have bus routes that travel along I-5 and SR 520, and there are westbound and eastbound transit stops on SR 520 at the Montlake Boulevard East bridge in the study area. There are also 54 bicycle lockers, currently all rented, located on Montlake Boulevard NE; a waiting list to rent the lockers indicates a strong demand. Bus service within the neighborhoods is provided by King County Metro, and there are routes on many of the busier streets in the neighborhoods that provide residents easy access to transit and connections to downtown Seattle. No park-and-ride facilities are located in the study area. Refer to the Transit chapter of the Transportation Discipline Report (WSDOT 2009k)



for additional information on transit services provided in the study area.

In early 2009, Sound Transit began constructing the University Link, an extension of the light-rail system from downtown Seattle. The line will travel in tunnels from downtown Seattle to the University of Washington and includes stations at Capitol Hill and near Husky Stadium on the University of Washington campus. Service to the University campus is expected to begin in 2016.

Eastside Transition Area

The Eastside transition area is located in Medina, a small city on the eastern side of Lake Washington in King County.

Community Cohesion

Medina occupies a peninsula projecting into Lake Washington. Built out primarily during the 1950s and 1960s, Medina consists primarily of single-family residences, and most of its properties are semi-wooded and heavily landscaped. The original construction of SR 520 in the 1960s bisected the northern portion of the city. Evergreen Point Road provides the only connection between the northern and southern portions of the city. Refer to Exhibit 10 for information about population characteristics in the study area and region.

Regional and Community Growth

Medina has likely not grown because it contains very little buildable land that has not already been developed. There is the potential for some of the larger properties to be subdivided allowing for new growth. Exhibit 11 provides information comparing the population growth in Medina to the larger areas of Seattle and King County.

Recreation Facilities

There are no recreation facilities located within the Eastside transition area of the study area.

Community Services

There are no schools, religious institutions, social institutions, government facilities, cemeteries, or defense institutions located within the study area in the Eastside transition area.

Fire and Emergency Medical

The Bellevue Fire Department provides service to Medina, with the nearest station located in Clyde Hill (at 9621 NE 24th Street). Response



times for the department in its service area have averaged between 5.5 and 6.5 minutes over the last 10 years (Bellevue Fire Department 2007).

Overlake Hospital Medical Center (1035 116th Avenue NE) in Bellevue is the closest hospital for residents of Medina. A Bellevue Medic One unit is based at the hospital and responds to calls in Medina.

Police

The Medina Police Department (at 501 Evergreen Point Road) provides law enforcement and responds to calls in Medina, Hunts Point, and occasionally SR 520.

Utilities

Electricity

Puget Sound Energy provides electricity to Medina.

Natural Gas

Puget Sound Energy provides natural gas to Medina.

Telecommunications

Qwest Communications is the principal provider of local telephone services in the study area. Qwest also provides internet service to residents in Medina. A cell tower owned by T-Mobile is located in the WSDOT right-of-way on the north side of the Evergreen Point Road bridge.

Cable

Comcast provides cable and internet service to the residents of Medina.

Water, Wastewater, and Stormwater

The Bellevue Utilities Department provides water and wastewater service to the City of Medina, and the City of Medina manages the stormwater facilities within the city limits. There are no major water-main or sewer-line crossings of SR 520 in the study area.

The King County Department of Natural Resources Wastewater Treatment Division provides sewage treatment services in Medina. Wastewater from the study area flows to the West Point Wastewater Treatment Plant on Puget Sound.

Garbage and Recycling Service

Waste Management provides service to the residents of Medina. No transfer stations or landfills exist in the area.

Pedestrian, Bicycle, and Transit Facilities

In Medina, sidewalks exist primarily on the busier streets. Where there are no sidewalks, some streets have paved walkways or wide shoulders



that pedestrians can use. The streets tend to have minimal traffic that travels at low speeds to minimize conflicts. No bicycle or transit facilities are present within the Eastside transition area of the study area. There are no plans for any new facilities in the study area.

The Evergreen Point Road Transit stop is located just east of the Evergreen Point Road bridge. The transit stop includes stations in the westbound and eastbound directions, and a small park-and-ride is located on the south side of SR 520. Sound Transit, King County Metro, and Community Transit all provide service to the transit stop.

Pontoon Production and Transport

As previously mentioned, an additional 44 supplemental stability pontoons would be constructed as part of the I-5 to Medina: Bridge Replacement and HOV Project. These pontoons might be constructed at the existing Concrete Technology Corporation, Inc. (CTC) facility in Tacoma, and some might be constructed at a new facility in Grays Harbor. Both the CTC site and the Grays Harbor County site would be located in industrial areas. There are no social elements in the CTC study area and, there are no social elements within the study areas surrounding the Grays Harbor alternative pontoon construction sites.

A number of social elements are located adjacent to the proposed haul route through Aberdeen and Hoquiam. Refer to Pontoon Construction Project Draft EIS Social Elements Technical Memorandum (WSDOT 2009l) for more information on the social elements located in the study areas and adjacent to the proposed haul route.



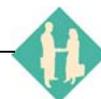
Potential Effects of the Project

This section describes the construction and operation effects, both positive and negative, of the No Build Alternative and the 6-Lane Alternative design options on the portions of the neighborhoods in the study area, including public services and utilities, that would be affected. This section also identifies mitigation measures that WSDOT may implement to minimize effects. Refer to the Environmental Justice Discipline Report (WSDOT 2009a) for information on Executive Order 12898 and the analysis of effects on minority and low-income populations.

What methods were used to evaluate the potential effects?

The social analyst used the following methods to evaluate the potential effects of the project:

- Reviewed existing data, including project plan sets and construction techniques, to identify areas of potential concern.
- Reviewed and analyzed the reports that have been prepared for the other disciplines that could affect the social elements in the study area, including the Transportation; Recreation; Noise; Visual Quality and Aesthetics; Air Quality; and Land Use, Economics, and Relocations discipline reports.
- Reviewed the public involvement information to identify outreach strategies used to inform residents and stakeholders in the study area about the project and identified the public concerns regarding project construction and operation.



How would construction of the project affect social elements?

No Build Alternative

Under the No Build Alternative, no construction-related effects would occur on social elements in the study area because no action would be undertaken.

6-Lane Alternative

Construction Effects Common to All Neighborhoods in the Study Area

Construction effects common to all neighborhoods in the study area include increased noise and dust levels, degraded visual quality, and increased congestion as a result of construction activities.

Construction noise levels would depend on the type, amount, and location of construction activities. Construction of certain project elements requires pile driving, and noise effects from pile driving would be the greatest in adjacent neighborhoods. Dust would be prevalent during demolition of the crossings over SR 520 (i.e., 10th Avenue East bridge) and demolition of the existing Portage Bay Bridge. Visual effects would be caused by the presence of construction equipment, vegetation removal, temporary bridges, and glare from any nighttime construction. Depending on location, the timeline of effects would vary. These varying effects are addressed below under the Construction Effects by Neighborhood section. Inconvenient driving conditions would occur with the temporary closures of mainlines to allow certain construction activities. WSDOT would develop and implement measures to offset and mitigate these effects, including following noise ordinances and best management practices. Refer to the Noise (WSDOT 2009c), Air Quality (2009m), and Visual Quality and Aesthetics (2009n), and Transportation (2009k) discipline reports for additional information on typical construction effects.

The sections below describe potential constructions effects on social elements that would be common to all neighborhoods in the study area.

Community Cohesion

Effects from construction activities on community life and residents and groups located within the study area would be of limited duration.



Construction effects would negatively affect residents' ability to meet socially and recreate compared to existing conditions. As described in the Affected Environment section, the original construction of SR 520 bisected and isolated neighborhoods; construction activities associated with the proposed project could cause residents to avoid the disrupted areas, creating additional barriers. As much as feasible, construction would occur within existing WSDOT rights-of-way. Certain project elements would require property acquisitions, and the effects of these acquisitions are described in 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 may also occur 7 days a week and possibly 24 hours a day. 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 the seven Seattle neighborhoods, the Lake Washington area, the Eastside transition area, and effects from pontoon production and transport.

Construction activities would require the use of detour routes, staging areas, and haul routes, described below.

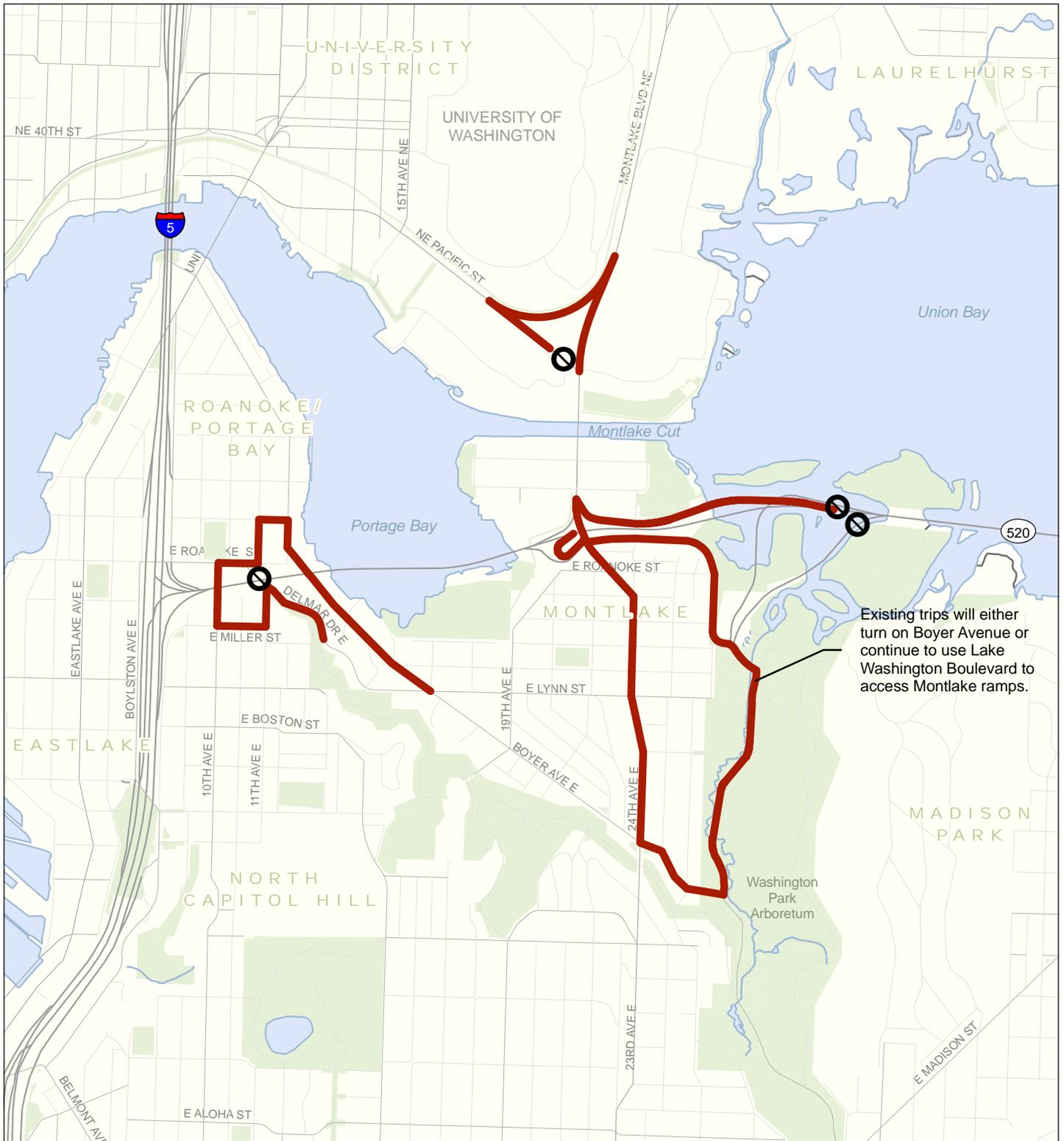
Detour Routes

Residents and travelers would be affected by roadway and ramp closures during construction due to increases in travel times and potential congestion. Detour routes have been identified and are illustrated in Exhibit 14. Detour routes that use the City of Seattle streets would need to be approved by the City prior to implementation.

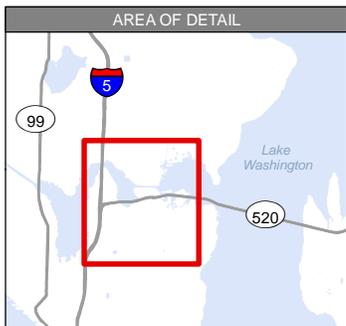
Staging Areas

Staging areas would be needed before, during, and after construction to allow for project closeout. As much as feasible, WSDOT rights-of-way would be used for construction staging areas. Where WSDOT right-of-way is not used, staging areas would be located in portions of recreation facilities, as illustrated in Exhibit 15. Effects associated with staging areas include noise, dust, and visual effects for residents and

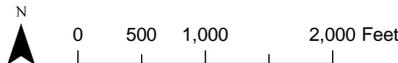




Existing trips will either turn on Boyer Avenue or continue to use Lake Washington Boulevard to access Montlake ramps.



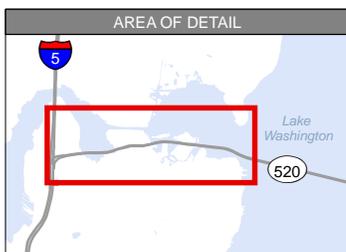
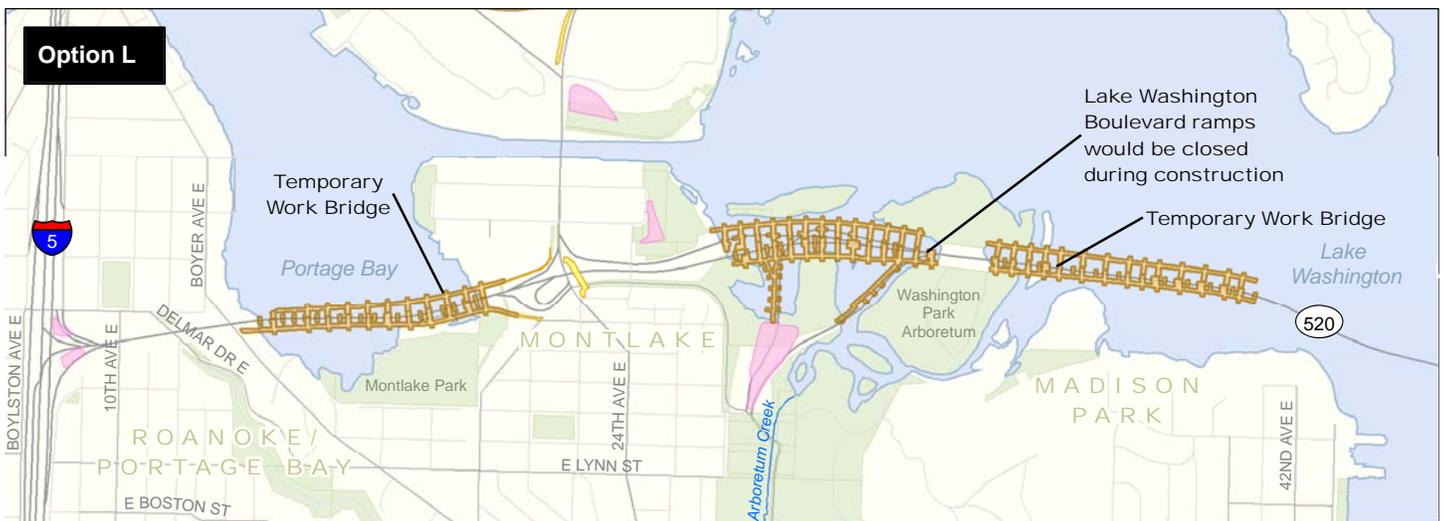
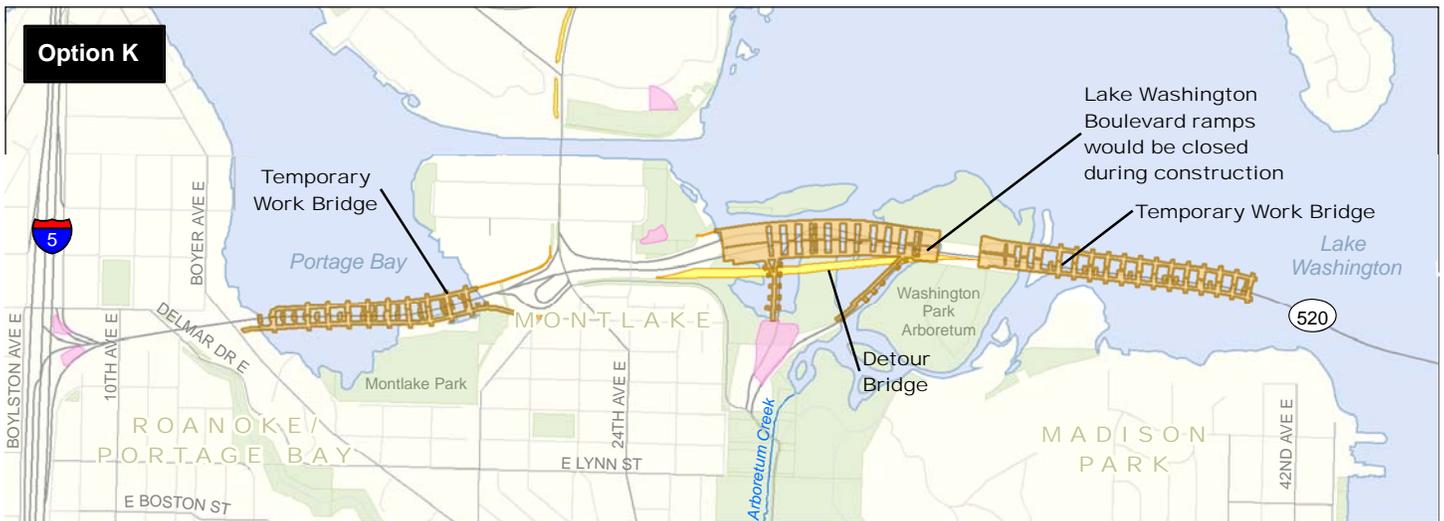
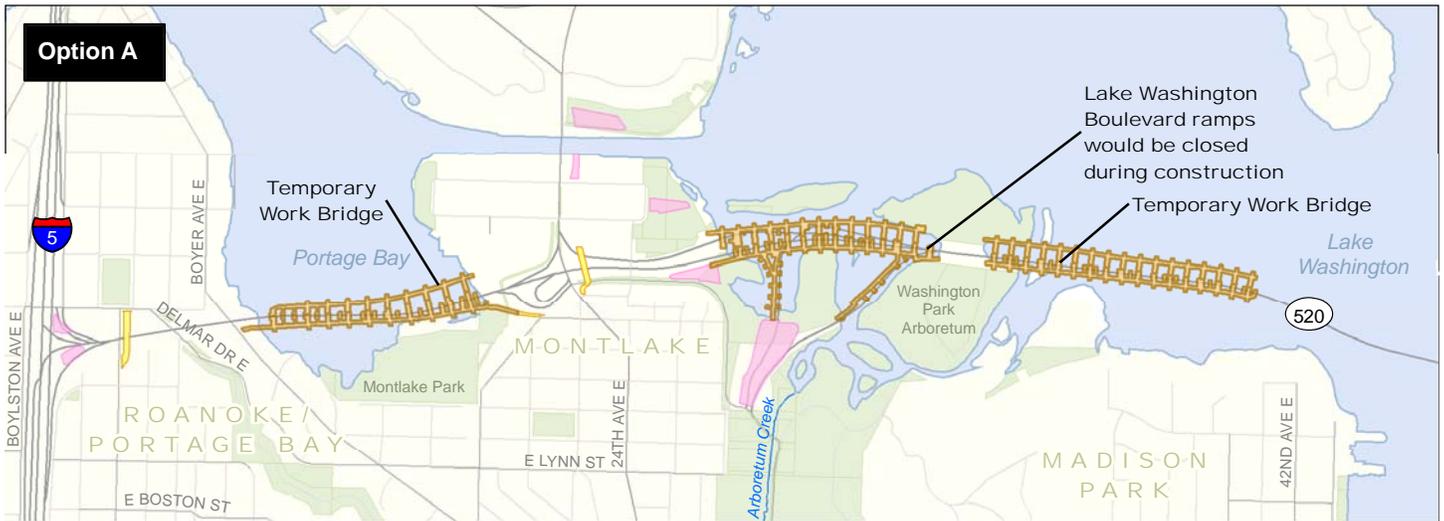
-  Closed Access
-  Potential Detour Route
-  Park



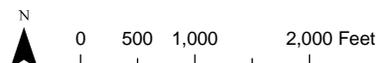
Source: King County (2005) GIS Data (Streams and Streets), King County (2007) GIS Data (Water Bodies), CH2M HILL (2008) GIS Data (Parks). Horizontal datum for all layers is NAD83(91); vertical datum for layers is NAVD88.

Exhibit 14. Potential Detour Routes

I-5 to Medina: Bridge Replacement and HOV Project



- Construction Staging Area
- Construction Work Bridge
- Detour Bridge
- Park



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 15. Potential Construction Staging Areas - All Design Options

I-5 to Medina: Bridge Replacement and HOV Project

recreation users in proximity. After construction is completed, the contractor may restore staging areas by removing structures and equipment, disconnecting utilities, and re-establishing grass or other vegetation. Staging areas not located in project right-of-way would no longer be required after construction and may be available for redevelopment or open space depending on location and size.

Haul Routes

All of the build options have associated truck trips and haul routes to allow for the transport of materials, as illustrated in Exhibit 16. Haul routes that use the City of Seattle streets would need to be approved by the City prior to implementation.

In addition to SR 520, haul routes would follow arterials and/or designated truck routes wherever possible. WSDOT has attempted to minimize truck trips on the non-arterial neighborhood streets and to SR 520. Haul routes through neighborhoods could result in negative effects related to noise, dust, and traffic congestion on the adjacent land uses and effects on individual neighborhoods. Although construction activities could occur 24 hours a day, there would be a 10-hour time period during the day for hauling of construction material for most construction activities to minimize effects on neighborhoods associated with truck trips during the evening hours.

Regional and Community Growth

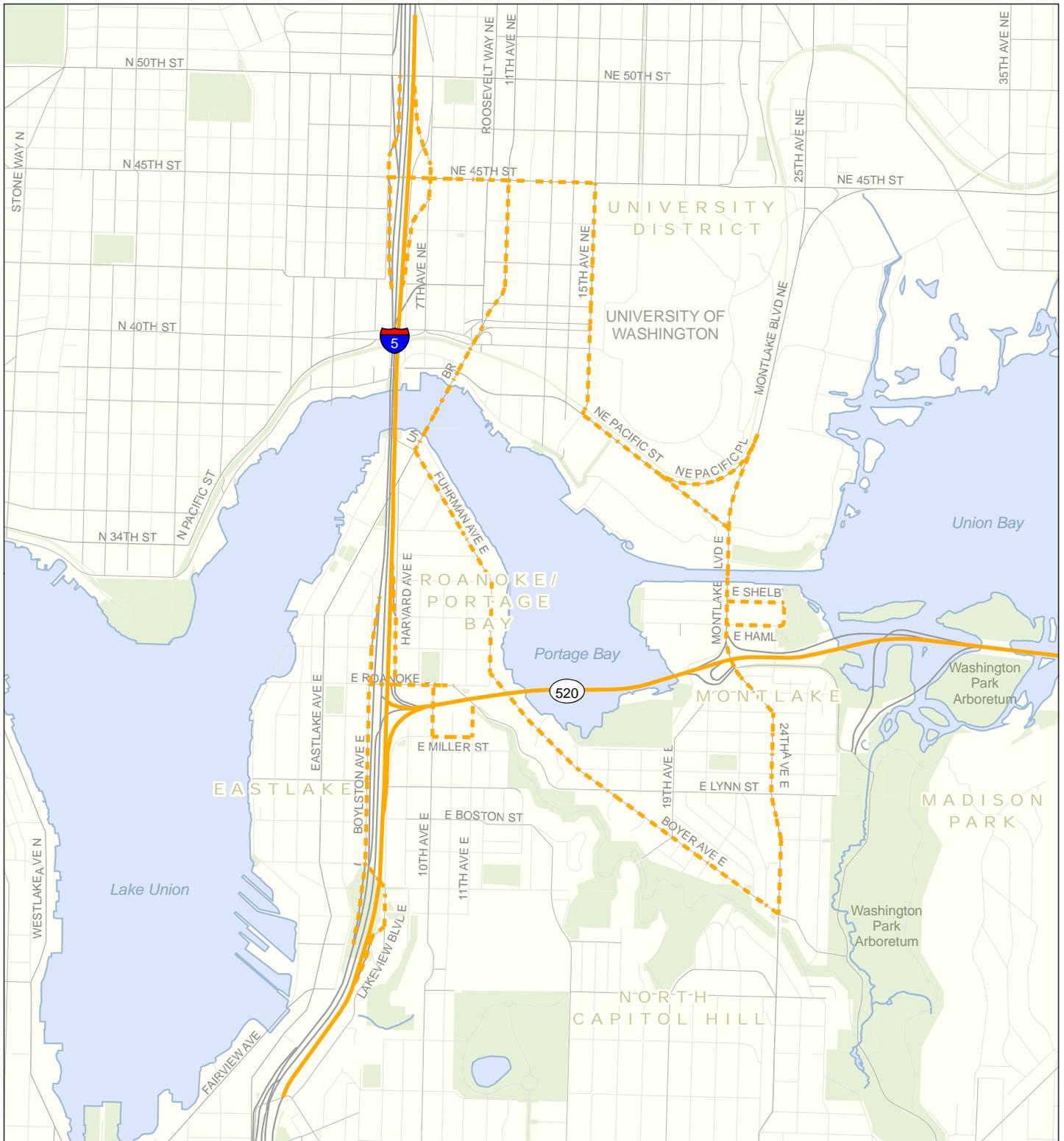
Although construction activities for Options A, K, and L would last up to 7 years, there would be no negative effects associated with the planned regional and community growth in the Puget Sound region or the study area.

The proposed project would require construction workers and would result in indirect employment opportunities during the construction period, but many of these workers would come from the Puget Sound region and would not have any effect on regional or community growth. Refer to the Land Use, Economics, and Relocations Discipline Report (WSDOT 2009o) for information on the number of relocations and workers associated with the proposed project and the associated economic benefits.

Recreation Facilities

Construction would affect 9 of the 16 recreation facilities in the neighborhoods of the study area. Parks and trails may be partially or totally inaccessible during construction. Access to most of the facilities





- Haul Route
- - - Potential Haul Route

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.

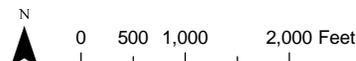


Exhibit 16. Proposed Haul Routes

I-5 to Medina: Bridge Replacement and HOV Project

would be maintained during construction. Effects on recreation facilities are described in the Construction Effects by Neighborhood section.

Community Services

Construction of the proposed project would not require the relocation of any community services or changes in service areas. Many of the community services in the study area would be affected by noise, dust, and congestion, and changes to visual environment.

Fire, Emergency Medical, and Police

Construction activities would require local road and mainline closures and detour routes (Exhibit 14) that may result in traffic congestion. Increases in traffic congestion could affect access and response times of fire, emergency medical, and police vehicles, and detour routes may result in more circuitous travel.

Construction activities may affect fire suppression if any hydrants or waterlines need to be relocated during construction or if water flow is temporarily interrupted.

Increased police security may be needed at construction sites, staging areas, and adjacent to construction access points to prevent theft, vandalism, or trespass.

Utility Providers

Construction activities may affect utilities located underground and aboveground. Specific effects on the utilities identified in the affected environment are discussed later under Construction Effects by Neighborhood in the Seattle Study Area. During construction, utility lines or cables may be rerouted or protected in place, which could cause temporary outages. These outages would likely be short-term and intermittent. Service outages would be coordinated with the utility prior to action. Relocation of some utilities may have a subsequent effect on other utilities near the relocation work. These effects would be reviewed and approved by the utility owner case-by-case prior to action. Before construction, the exact location and depth of utilities would be verified with utility providers, and construction methods would be developed to minimize utility effects. For utilities with WSDOT franchise agreements, any relocation would be addressed under the provisions in each provider's agreement.



Similar effects to those described under the Fire, Emergency Medical, and Police section would also affect utility providers with vehicles traveling within the study area.

Pedestrian, Bicyclist, and Transit Facilities

Noise, dust, and changes to the visual environment during construction would affect pedestrians, bicyclists, and transit riders at transit stops in proximity to construction activities. Construction activities would require the temporary closure of facilities in the surrounding neighborhoods that pedestrians and bicyclists use. Detour routes would be provided.

Transit operations along the SR 520 corridor, including the roadways that cross over SR 520 and the local roadways in proximity to SR 520, could be affected by increased traffic congestion, which could affect schedules. Mostly, travel lanes in the SR 520 corridor would remain open during construction; however, any mainline closure or local roadway closures could affect transit riders if they occur during scheduled transit hours and may require detours. The closure of the Montlake Freeway Transit Station would affect a number of riders in the neighborhoods in the study area. Riders would need to transfer to another bus before reaching their destination, ride a different local bus, or catch a bus at a different transit stop. WSDOT is coordinating with local and regional transit agencies and would continue to coordinate through construction. The Sound Transit North Link University of Washington Station is assumed to be constructed prior to construction of the I-5 to Medina: Bridge Replacement and HOV Project, which would allow some residents who used the Montlake Freeway Transit Station to use light rail to connect to and from downtown Seattle. Additional information on the required transit stop relocations or detours are discussed under Construction Effects by Neighborhood in the Seattle Study Area and Construction Effects in the Eastside transition area.

Construction Effects by Neighborhood in the Seattle Study Area

The following sections provide information on construction effects that would occur within those portions of the Seattle neighborhoods adjacent or in proximity to construction-related activities. Exhibit 17 illustrates the anticipated construction durations for the 6-Lane Alternative project elements and identifies the affected neighborhoods.

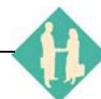


Exhibit 17. Estimated Construction Durations for 6-Lane Alternative Options A, K, and L

Project Element	Option A (Months)	Option K (Months)	Option L (Months)	Affected Neighborhoods
I-5 and SR 520 Interchange	21	21	21	Eastlake, North Capitol Hill, Portage Bay/Roanoke
10th Ave & Delmar Lids	27	27	27	Portage Bay/Roanoke, North Capitol Hill
Portage Bay Bridge (North side – 4 lanes)	30	30	30	Portage Bay/Roanoke, Montlake
Portage Bay Bridge (south half – widen to 6 lanes, includes demolition of existing structure)	42	42	42	Portage Bay/Roanoke, Montlake
Montlake Interchange and Lid	45	N/A	N/A	Montlake, Portage Bay/Roanoke
SPI, Montlake Lid; Lake Washington Boulevard south of SR 520	N/A	78	60	Montlake
Pacific Street and Montlake Intersection with lid	N/A	18	18	University District, Montlake
New Bascule Bridge	27	N/A	30	Montlake (University District and Laurelhurst under Option L only)
Tunnel from SR 520 to Pacific Avenue/Montlake Boulevard E	N/A	45	N/A	Montlake, University District
West Approach (north half – 4 lanes, includes work in Union Bay)	30	54 ^a	30	Montlake, Madison Park, Laurelhurst
West Approach (south half – widen to 6 lanes, includes demolition of existing structure)	30	30	30	Montlake, Madison Park, Laurelhurst
Floating Bridge and East Approach (includes towing, outfitting, and installing pontoons for 6 lanes)	54	54	54	Montlake, Madison Park, Laurelhurst, Medina
Bridge Maintenance Facility	24	24	24	Medina

Note:

N/A = not applicable

^aIncludes Foster Island lid

Source: WSDOT (2009k)

Because several of the sequenced construction activities would overlap, the duration of all the project elements would not be the sum of the duration of each element. Construction activities would continue at least as long as the longest construction duration associated with the project elements in the design options identified in Exhibit 17.



Eastlake

Construction activities associated with the project elements in Options A, K, and L would result in the same level of effects on each of the social elements in the Eastlake neighborhood. Because there would be no difference among design options in the construction effects within the Eastlake neighborhood, the discussion of effects does not differentiate the design options.

Construction activities in the Eastlake neighborhood would last up to 21 months. There would be no construction effects on pedestrian, bicyclist, or transit facilities beyond the effects described under Construction Effects Common to All Neighborhoods in the Study Area.

Community Cohesion

Construction activities associated with the I-5/East Roanoke Street lid would require narrowing and shifting to the west Boylston Avenue East. Boylston Avenue East is also a proposed haul route (Exhibit 16), with a projected average of 5 truck trips per day and up to 60 truck trips per day during peak periods.

Boylston Avenue East would also be used as a haul route during the construction of the 10th and Delmar lid, which could affect the neighborhood for up to 27 months. Truck trips would average 11 per day, with up to 80 truck trips per day during peak periods. Residents in close proximity to construction activities would experience effects similar to those discussed under Construction Effects Common to All Neighborhoods in the Study Area.

Recreation Facilities

Rogers Playfield may be affected by construction activities associated with the I-5/East Roanoke Street lid. Construction would not require permanent or temporary land acquisitions, but there may be effects related to noise and dust because of proximity to construction activities during the 27-month construction duration.

Community Services

The only community service affected during construction would be the TOPS School. There would be no construction-related effects unique to the Eastlake neighborhood on religious facilities; social institutions; government facilities; fire, emergency medical, or police; or utilities.

Schools

Increased noise, dust, and traffic congestion would affect students attending the TOPS School because of proximity of the school to construction associated with the I-5/Roanoke lid. A traffic management



plan would be developed before construction that would identify measures to minimize effects on the local streets and provide for the safety of students.

North Capitol Hill

Construction activities associated with the project elements in Options A, K, and L would result in the same level of effects on each of the social elements in the North Capitol Hill neighborhood. Because there would be no difference among design options in the construction effects within the North Capitol Hill neighborhood, the discussion of effects does not differentiate the design options. Construction duration in the North Capitol Hill neighborhood would be up to 27 months. There would be no construction-related effects on recreation facilities or any of the community services unique to the North Capitol Hill neighborhood and no transit facility-related effects beyond those described under Construction Effects Common to All Neighborhoods in the Study Area.

Community Cohesion

In addition to the effects described under Construction Effects Common to All Neighborhoods in the Study Area, construction activities would require the Delmar Drive Bridge to be closed for approximately 9 months. Although a detour route would be provided (Exhibit 14), the detour may result in some residents taking a more circuitous route to reach their destinations; it may also cause a temporary loss of on-street parking for neighborhood residents and visitors. In addition, the residents along the detour route – which includes portions of 11th Avenue East, East Miller Street, 10th Avenue East, East Roanoke Street, East Edger Street, and Boyer Avenue East – would potentially be affected by increases in noise and congestion. Because of narrow roadway width along 11th Avenue East, parking would need to be restricted or the roadway temporarily modified to allow two-way traffic.

Haul routes have also been identified along the same routes that would be used as a detour, except for East Edger Street and 11th Avenue East north of East Roanoke. An average of 11 truck trips per day and up to 80 truck trips per day during peak periods would occur during the entire construction duration of 27 months.

Pedestrian and Bicyclist Facilities

The bridge over SR 520 on Delmar Drive East would be closed during construction, but a detour route would be established before demolition, as described above under Community Cohesion. However,



detour routes could include steep sections that may have negative effects for some users, including users with disabilities. Users would also be affected by noise, dust, and changes to the visual environment due to construction activities. The temporary bridge at 10th Avenue East would include sidewalks for safe pedestrian and bicyclist movements.

Portage Bay/Roanoke

Construction activities associated with the project elements in Options A, K, and L would result in the same level of effects on each of the social elements in the Portage Bay/Roanoke neighborhood. Because there would be no difference among design options in the construction effects within the Portage Bay/Roanoke neighborhood, the discussion of effects does not differentiate the design options. As illustrated in Exhibit 17, construction duration for the Portage Bay Bridge is separated for the north and south portions of the bridge; however, the total construction time would not be the sum of the durations for these two elements because there would be an overlap in the construction. Construction activities for the Portage Bay Bridge would last for at least 42 months. There are no transit facility-related effects beyond those described under Construction Effects Common to All Neighborhoods in the Study Area.

Community Cohesion

In addition to the construction effects identified above under Common Construction Effects, residents in proximity to pile-driving activities would be affected by noise to a greater degree because of the noise levels associated with pile driving. Pile driving would be required for the temporary work bridges and for the new Portage Bay Bridge. Although actual noise levels would vary, depending on the distance and topographical conditions between the pile-driving location and the receiver location, residents more than 1,000 feet from the activities may be affected. For the residents of the five residential buildings within 50 feet, noise levels could be up to 105 A-weighted decibels (dBA) and drop as the noise receiver moves farther away; however, the noise levels would still be almost 80 dBA at 1,000 feet from the pile-driving activities. Exhibit 18 illustrates common noise sources and compares their relative loudness to that of an 80-dBA source, such as a garbage disposal or food blender.

What is an A-weighted sound level?

Sound-measuring equipment uses filters that approximate the way humans interpret sound. Measurements taken with this filter are referred to as A-weighted sound levels, expressed as A-weighted decibels (dBA).



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
Garbage disposal (2 feet) Pneumatic drill (50 feet)	80	Moderately loud	Reference loudness
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	

Sources: Beranek (1988) and U.S. Environmental Protection Agency (1971).

Exhibit 18. Sound Levels and Relative Loudness of Typical Noise Sources

Residents adjacent to proposed haul routes along Fuhrman Avenue East, East Roanoke Street, and Harvard Avenue East (Exhibit 16) may be affected by noise and visual effects associated with truck traffic, which would average 10 truck trips per day and up to 50 per day during peak construction periods. Residents would also be affected by the detour route associated with the closure of Delmar Drive East and experience effects like those described above under North Capitol Hill.

Recreation Facilities

The proposed project would require the permanent acquisition of the Bagley Drive Viewpoint to allow construction of the 10th Avenue and Delmar Drive lid (Exhibit 19). The viewpoint is a small facility (occupying 0.15 acre), has no amenities other than parking spaces, and Roanoke Park and Interlaken Park are nearby, so there would be minor effects associated with the loss of the facility during construction.



Exhibit 19. Temporary Construction Effects on Parks

Resource	Neighborhood	Option A ^a	Option A Suboptions ^a	Option K ^a	Option L ^a
Roanoke Park	Portage Bay/Roanoke	N/A	N/A	N/A	N/A
Bagley Viewpoint	Portage Bay/Roanoke	0 ^b	0 ^b	0 ^b	0 ^b
Interlaken Park	Montlake	0.05 (>1%)	0.05 (>1%)	0.05 (>1%)	0.05 (>1%)
Montlake Playfield	Montlake	0.3 (1%)	0.3 (1%)	0.2 (>1%)	0.2 (>1%)
East Montlake Park	Montlake	1.2 (17%)	1.3 (17%)	0.9 (13%)	1.6 (23%)
McCurdy Park	Montlake	0 ^b	0 ^b	0 ^b	0 ^b
Washington Park Arboretum	Montlake/Madison Park	2.4 (1%)	2.7 (1%)	5.3 (3%)	3.5 (2%)
University of Washington Open Space	University District	1.1 (>1%)	1.1 (>1%)	0.5 (>1%)	0.9 (>1%)
Total Effects in Acres		5.05 (>1%)	5.45 (>1%)	6.95 (>1%)	6.25 (>1%)

Note:

The percentages shown indicate the amount of the park area that would be affected during construction.

^a Values in acres of land affected.

^b All of Bagley Viewpoint and McCurdy Park would be permanently acquired and would be occupied during construction; therefore, these totals appear in the operations discussion.

Roanoke Park would not require any permanent or temporary acquisitions but would be affected by construction activities related to noise and dust because of proximity to the construction activities. These effects would last for the entire construction duration of the 10th Avenue and Delmar Drive lid (up to 27 months). Access to the park may be limited from East Roanoke Street and Delmar Drive East during construction.

Community Services

No construction-related effects are anticipated on schools, social institutions, or government facilities. Effects on other types of community services are described below.

Religious Facilities

There are two religious facilities, Saint Patrick's Catholic Church and Vedanta Society of Western Washington, located in proximity to the construction activities associated with the 10th Avenue East and Delmar Drive East lid. Traffic congestion and detour routes may result in more circuitous travel for those who attend the facilities for the 29- to 31-month construction duration, depending on where they live in the surrounding area, especially those accessing from SR 520 or across



Delmar Drive East. Because construction could occur 7 days a week, attendees could be affected by noise and dust.

Fire, Emergency Medical, and Police

Construction activities associated with the improvements along 10th Avenue East and East Roanoke Street would affect Seattle Fire Department Station #22 and the Washington State Patrol detachment. The temporary bridge at 10th Avenue East would be constructed prior to any demolition, and access and egress would be maintained at all times for the two public service providers. Although detour routes would be developed and shared with these providers in advance to minimize effects, the closure of the Delmar Drive East for 9 months may result in minor negative effects on response times for areas south of SR 520.

Utilities

Construction activities near the water main that crosses SR 520 between 10th Avenue East and Delmar Drive East and 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 (e.g., 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 implemented.

Pedestrian and Bicyclist Facilities

Effects on pedestrians and bicyclists who use Delmar Drive East would be the same as those discussed above under North Capitol Hill.

Montlake

Most effects associated with Options A, K, and L would occur within the Montlake neighborhood. Because the project elements associated with Options A, K, and L would often result in different construction effects, the design options are discussed separately for each social element when necessary.

Community Cohesion

Residents in Montlake would realize the longest duration of construction effects because of the construction activities associated with the Portage Bay Bridge, the Montlake interchange, and the West Approach (Exhibit 17). Total duration would not be the sum of construction time for each of these project elements because there would be an overlap in the construction periods, but construction activities would last at least between 45 and 78 months, depending on



the design option selected. Pile-driving activities associated with the Portage Bay Bridge and the West Approach would result in the greatest noise effects during construction of any of the project elements, affecting residents in proximity to these activities to a greater degree than residents who are farther away. As described above under Portage Bay/Roanoke, noise levels associated with pile driving would have the greatest effect on the residents in the five residential buildings within 50 feet of the activities, and noise levels would decrease with distance away from pile driving (Exhibit 18).

The closure of the Lake Washington Boulevard ramps may result in additional traffic and potential congestion in the Montlake neighborhood as traffic from Madison Park travels through the neighborhood along the detour routes associated with 24th Avenue East and Lake Washington Boulevard East (Exhibit 14) to and from SR 520. The westbound off-ramp would be closed for approximately 21 to 24 months before the closure of the eastbound on-ramp. Improvements on Montlake Boulevard would occur prior to the closure of the ramps to minimize delays and queuing in the interchange area. With the improvements in place, traffic would operate similar to existing conditions, and drivers would experience the same level of congestion that they currently experience. The improvements would minimize the negative effects on the local street network in the neighborhood. Refer to the Transportation Discipline Report (WSDOT 2009k) for more information on the proposed improvements and traffic operations.

Use of staging areas associated with East Montlake and McCurdy parks (Exhibit 15) would result in noise, dust, and visual effects on residents along East Shelby Street, East Hamlin Street, and Park Drive East, as well as recreation users, during the 27- to 45-month duration of construction activities, depending on design option. The closure of McCurdy Park and the partial closure of East Montlake Park would also result in lost opportunities for residents to enjoy the facilities and amenities, as well as to use them to gather and meet socially.

The haul route through the neighborhood (Exhibit 16) would affect residents in Montlake more than residents of other neighborhoods because most of the truck trips anticipated during construction would be associated with access to SR 520 from Montlake Boulevard. Other arterials affected would include East Shelby Street, East Hamlin Street, 24th Avenue East, and Boyer Avenue East. The estimated number of truck trips along these arterials would be relatively low compared to



overall arterial volumes, with the exception of East Shelby Street and East Hamlin Street under Options K and L, discussed below.

Option A

In addition to the effects described above under Community Cohesion, Option A would include acquisition of the gas station on Montlake Boulevard East to allow for the improvements to the interchange and the construction of the new bascule bridge over the Montlake Cut, which would also require the acquisition of two single-family residences in the Montlake neighborhood. These effects are discussed below in the Operation Effects section. Neighboring residences would be affected by noise, dust, and traffic congestion during the up to 32-month construction duration, depending on the sequencing of the project.

Option A would require fewer truck trips than options K and L. Haul routes would be established prior to construction (Exhibit 16) and would include Montlake Boulevard to SR 520. The effects would be the same as those described above under Construction Effects Common to All Neighborhoods in the Study Area. Over the duration of construction of the interchange improvements and the new bascule bridge, which would last at least 45 months, truck trips would average 6 per day and would be up to 90 per day during peak construction periods.

Option K

In addition to the construction effects described under Community Cohesion, the project elements associated with Option K would have the longest construction durations related to north side of the West Approach and the tunnel under the Montlake Cut, as illustrated in Exhibit 17. Construction of Option K would result in additional noise, dust, and congestion effects on the residents in the northeast portion of the Montlake neighborhood. Additionally, those areas in proximity to the tunnel portals, located near the existing MOHAI building and at the Montlake Boulevard NE and NE Pacific Street intersection, are likely to experience greater levels of noise and dust, visual, and construction traffic effects because of the number of truck trips associated with Option K and the long construction duration (i.e., up to 50 months).

Option K would require the most truck trips, averaging 17 per day and up to 120 per day during peak construction periods for the 45-month duration of tunnel construction across the Montlake Cut. Option K also would have an average of 50 truck trips per day with peaks up to 300



for the 78-month construction duration of the new interchange at SR 520. The additional trips associated with Option K are likely to result in a greater level of effects along the haul routes in Montlake, especially for residents adjacent to Montlake Boulevard, East Shelby Street, and East Hamlin Street (Exhibit 16). In addition, construction activities would likely require a 24-hour time period for hauling construction materials associated with the tunnel under the Montlake Cut, resulting in additional noise effects for residents adjacent to Montlake Boulevard, East Shelby Street, and East Hamlin Street during the evening and early morning hours.

Option K would also result in a greater intensity of construction noise for residents north of SR 520 and east of Montlake Boulevard because of pile-driving activities associated with the tunnel under the Montlake Cut. Refer to the Community Cohesion discussion above under Portage Bay/Roanoke for information on the noise effects that would be expected during pile driving.

Option L

Because of its elevated project elements, construction associated with Option L would result in additional visual effects on surrounding residents in the Montlake neighborhood compared to the other options. Option L would require more truck trips than Option A and fewer truck trips than Option K. On average, Option L would require 15 truck trips per day and up to 160 during peak periods during the 60-month construction duration for the new interchange at SR 520. Like Option K, Option L would result in additional construction effects on the residents in the northeast portion of the Montlake neighborhood.

Recreation Facilities

As illustrated in Exhibit 19, construction of the proposed project would require temporary and permanent acquisition of recreation facilities in the Montlake neighborhood. For the portions of any facilities that remain open during construction, users would experience noise, dust, and visual effects and may choose to avoid these facilities until construction is complete. The temporary construction effects related to temporary acquisition represents less than 1 percent of the total area of Interlaken Park, approximately 1 percent of Montlake Playfield, approximately 17 percent of East Montlake Park, and between approximately 1.2 and 2.7 percent of the Washington Park Arboretum. For Interlaken Park and Montlake Playfield, the temporary effects would not affect areas used by visitors or access to the parks. After



construction has been completed, these areas would be returned to park use.

The closure of the Lake Washington Boulevard ramps would result in decreased traffic and noise through the Washington Park Arboretum, thereby benefiting park users and residents in proximity to the Arboretum. In addition, portions of the Bill Dawson Trail would be closed during the entire construction period of the Portage Bay Bridge for between 30 to 36 months. Also, 24th Avenue East, which is used by bicyclists and is part of the Lake Washington Loop Route, would be closed continuously for between 45 and 78 months, depending on the design option and construction sequencing, to allow construction of the lid in the Montlake area. Montlake Boulevard would remain open to allow access across SR 520. Portions of the Arboretum Waterfront Trail, as well as access to this recreation facility, would be closed continuously during construction for 30 to 54 months, depending on design option and sequencing; this would limit access to Foster Island. Refer to Recreation Discipline Report (WSDOT 2009i) for more information on construction effects on the recreation facilities.

Option A

Under the Option A construction duration of at least 45 months, project elements would be completed in an overall shorter time frame among the three options, minimizing the effect on access and use of recreation facilities in the study area. An additional effect associated with Option A would be temporary intermittent closures of the Ship Canal Waterside Trail to allow for constructing the new bascule bridge.

Option K

Option K would have the longest construction duration, at least 78 months, which would affect recreation facilities and users in the area. In addition to the construction effects described above, Option K would result in additional effects on the portion of the Foster Island Trail that crosses under the existing Evergreen Point Bridge. This section of trail would be closed continuously during construction of the West Approach, which would take at least 54 months. Access to the Foster Island Trail from the East Montlake Park would not be affected. Option K would also have greater intensity and longer duration of overall effects on East Montlake and McCurdy Parks because of the construction activities associated with the tunnel under the Montlake Cut.



Option L

Option L would not result in additional effects on recreation facilities beyond those common to all options in the Montlake neighborhood. Recreation facilities would be affected for at least 60 months.

Community Services

Schools

Although access along Montlake Boulevard would be maintained, construction activities may affect travel times for students who live north of SR 520 and who attend the public or private schools in portions of the Montlake neighborhood within the study area.

Social Facilities

Users of the Montlake Community Center would be affected by noise as a result of construction activities on the Portage Bay Bridge. The Montlake Branch of the Seattle Public Library would not be affected by additional traffic congestion associated with the closure of the Lake Washington Boulevard ramps.

Religious Facilities

Effects on the Saint Demetrios Greek Orthodox Church in the Montlake neighborhood would be similar to those described above in the section describing effects in the Portage Bay/Roanoke neighborhood.

Government Facilities

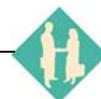
Construction activities would result in noise and dust effects at the NOAA facility. Traffic congestion associated with the improvements along Montlake Boulevard East would result in effects on access and egress during the duration of construction.

Fire, Emergency Medical, and Police

Although detour routes would be developed and shared with fire, emergency medical, and police organizations before construction begins to minimize effects and access to their facilities, the closure of the Lake Washington Boulevard ramps may 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 the 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. Closure or relocation of these facilities would result in a significant adverse effect. 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.

Option A

In addition to the effects described above under Government Facilities in the Montlake Neighborhood, Option A would cause additional effects on the NOAA facility. Buildings on the NOAA facility South Campus, just north of SR 520, would be affected and would require relocation to construct the Montlake interchange. (Refer to the Land Use, Relocations, and Economics Discipline Report [WSDOT 2009o] for more information.) Constructing Option A could require relocating the entire facility because of the extent of the effects. In addition, the special internal water utility system used to support the lab facilities and experiments at the NOAA facility might be affected if relocating the water lines is necessary; also, equipment used by the facility (i.e., electron microscope) might be affected by construction activities, especially those associated with pile driving, resulting in vibration effects. WSDOT is coordinating with NOAA on measures that would be developed before construction to limit duration and intensity of these effects.

Option A would require the fewest truck trips, as detailed under Community Cohesion, and would result in the fewest effects on access to any of the facilities and the lowest level of effects on the travel and response times of public service vehicles.

Option K

Although Option K would not require acquisition of any buildings on the NOAA facility site, construction activities could affect experiments and research programs there through reduced access, utility closures, and/or vibration effects. The additional truck trips associated with Option K may result in negative effects on response and travel times for fire, emergency medical, and police vehicles due to traffic congestion along the haul routes, particularly during the peak construction period when there could be up to 300 trucks trips per day.

Option L

Option L would result in effects similar to those described under Option K.



Pedestrian, Bicyclist, and Transit Facilities

As described above in the Recreation Facilities section, portions of the Bill Dawson Trail and 24th Avenue East would be closed, but pedestrians and bicyclists would have access over SR 520 at Montlake Boulevard.

The Montlake Freeway Transit Station on SR 520 would be closed during construction and permanently relocated under all Options, which would affect residents who use this station. The closure of the station would require riders traveling from or to the location to either transfer at a different location or catch a different local bus to reach their destination. The Sound Transit North Link University of Washington Station is assumed to be constructed prior to construction of the I-5 to Medina: Bridge Replacement and HOV Project, which would allow some residents who used the Montlake Freeway Transit Station to use light rail to connect to and from downtown Seattle. WSDOT is coordinating with local and regional transit agencies to address this closure of the Montlake Freeway Transit Station. In addition, bus stops on Montlake Boulevard at SR 520 would need to be relocated during construction. Construction of the Montlake Boulevard lid over SR 520 would require shifting travel lanes and changing channelization, which would reduce or eliminate space available for the existing bus stops. The stops in this area would be relocated north or south of the interchange and would require pedestrians to walk up to two additional blocks to access transit. Construction activities may require relocating the bicycle lockers at the Montlake interchange. Construction activities and the associated truck trips would also affect transit travel times and reliability because of increased congestion or roadway/lane closure along SR 520 and Montlake Boulevard East. Construction activities and the transit station closure would likely require additional buses on other routes to accommodate passengers. WSDOT is coordinating with local and regional transit agencies to address the effects anticipated.. Refer to the Transportation Discipline Report (WSDOT 2009k) for complete information.

Option A

Option A would not result in any additional effects on pedestrian, bicycle, and transit facilities.

Option K

In addition to the construction effects on pedestrian, bicycle, and transit facilities in the Montlake neighborhood described above, under Option K, constructing the intersection of NE Pacific Street and



Montlake Boulevard NE would require modifying the existing pedestrian and bicyclist routes. Access would be maintained on one side of Montlake Boulevard NE at all times during the construction period, and pedestrian crossings would be provided at intersections. A temporary pedestrian overcrossing is also proposed just south of the NE Pacific Street and Montlake Boulevard NE intersection to maintain pedestrian access during construction on the east and west sides of Montlake Boulevard NE. Buses traveling along Montlake Boulevard NE may experience increased travel times due to construction activities that require lane closures. Refer to the Transportation Discipline Report (2009h) for further information.

Option L

Construction effects would be similar to those described for Option K above.

University District

Community Cohesion

Although there are no residents in proximity to the construction activities, there would still be the potential for negative effects on community cohesion related to student access to events and activities at the University of Washington facilities adjacent to Montlake Boulevard East. These events and activities are related to the student community at the University of Washington.

Recreation Facilities

As shown in Exhibit 15, portions the University of Washington open space could be used for staging areas. Noise, dust, and visual effects associated with using the open space for construction staging may affect recreation users and residents in proximity to these areas. Effects would occur for up to 45 months.

Option A

No additional construction effects on recreation facilities would occur beyond those described above. The staging area proposed would not affect all of the area used for active recreational purposes at University of Washington open space.

Option K

Construction activities associated with the tunnel would result in the lost access to recreation facilities at the University of Washington Waterfront Activities Center for approximately 45 months and would affect approximately 500 parking stalls, which could negatively affect event attendance at Husky Stadium.



Option L

Construction effects on recreation facilities would be similar to those described under Option K; however, Option L would only affect approximately 200 parking stalls.

Community Services

There would be no construction-related effects on religious institutions, social institutions, government facilities, or utilities in the University District.

Schools

Construction activities would not affect any of the educational resources at the University of Washington campus. As described under Community Cohesion and Recreation for the University District, access to the resources would be affected during construction. 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 use of the Arboretum for educational purposes, which is part of its institutional mission, as a result of noise, dust, vibration, and the temporary closure of portions of the facility.

Fire, Emergency Medical, and Police

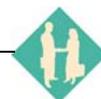
Access to University of Washington Medical Center would be maintained for emergency vehicles; however, construction activities may affect travel times to the facility from SR 520 and Montlake Boulevard.

Option A

No additional construction effects on community services would occur beyond those described above.

Option K

In addition to the effects described above, construction activities in the NE Pacific Street and Montlake Boulevard intersection area would result in potential access issues for emergency vehicles accessing the University of Washington Medical Center. Temporary access could be developed by widening the existing pedestrian pathway along Montlake Boulevard during construction. A one-way access road would need to be modified to accommodate northbound emergency vehicles accessing the University of Washington Medical Center Emergency Room. Refer to the Transportation Discipline Report (2009h) for further information.



Option L

Construction effects would be the same as those described for Option K.

Pedestrian, Bicyclist, and Transit Facilities

For all three design options, students traveling on SR 520 to the University of Washington may have longer travel times due to construction activities along SR 520 and in the Montlake interchange area. There would be no additional construction effects on pedestrian and bicycle facilities for the three design options.

Option K

Under Option K, constructing the intersection of NE Pacific Street and Montlake Boulevard NE would require modifying the existing pedestrian and bicyclist routes. Access would be maintained on one side of Montlake Boulevard NE at all times during the construction period, and pedestrian crossings would be provided at intersections. A temporary pedestrian overcrossing is also proposed just south of the NE Pacific Street and Montlake Boulevard NE intersection to maintain pedestrian access during construction on the east and west sides of Montlake Boulevard NE. Sound Transit's underground station next to Husky Station would be operational before project construction. Users of the Sound Transit system could be affected by noise, dust, and visual effects as they enter and leave the station. To ensure that project conflicts and unnecessary construction effects, including construction staging, would be minimized, WSDOT would continue coordinating with Sound Transit.

The closure of a portion of NE Pacific Street for a period of 9 to 12 months to allow construction would require relocating a major University of Washington transfer point and could also result in increased transit travel times due to detours and traffic congestion. The transfer point provides access to the University of Washington Medical Center, the main University of Washington campus, and Husky Stadium could be relocated to NE Pacific Place. Refer to the Transportation Discipline Report (2009h) for further information on the relocation of this transfer point and two other bus stops in the area.

Option L

Effects on transit facilities would be the same as those described above under Option K.



Madison Park

Construction effects associated with the project elements in Options A, K, and L would result in the same level of effects on the social elements in the Madison Park neighborhood; therefore, the discussion of effects does not differentiate among the design options. There would be no construction effects on recreation facilities, community services, or pedestrian, bicycle, and transit facilities in Madison Park.

Community Cohesion

Residents would experience noise effects associated with constructing the West Approach and Floating Bridge. Water increases noise transmission, so residents near the Lake Washington shoreline would experience a greater level of noise effects associated with construction activities, including pile driving, than those who reside in higher locations or where trees or structures reduce noise transmission. However, no residences are within 50 feet, where the greatest level of effects would occur; the nearest residences are approximately 750 feet from construction activities. Residents with views of SR 520 would experience negative visual effects from the temporary work bridge and associated construction equipment. These effects would occur for at least 54 months, depending on construction sequencing. 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 (Exhibit 14).

Fire, Emergency Medical, and Police

Although advanced detour routes would be developed and shared with fire, emergency medical, and police service providers to minimize effects and ensure access to their facilities, the Lake Washington Boulevard ramps closure may affect response times.

Laurelhurst

Construction effects associated with the project elements in Options A, K, and L would result in the same level of effects on the social elements in the Laurelhurst neighborhood, except as noted; therefore, the discussion of effects does not differentiate among the design options. There would be no construction effects on recreation facilities, community services, or pedestrian, bicycle, and transit facilities in the Laurelhurst neighborhood.

Community Cohesion

Like Madison Park, residents along the Lake Washington shoreline would realize an increased noise level because water increases the transmission of noise levels. The area of Laurelhurst within the study



area is more than 2,000 feet away from construction activities that would include pile driving; therefore, no negative effects from such activities are anticipated. Residents may experience negative visual effects associated with Options K and L. These effects would occur for at least 54 months, depending on construction sequencing.

Construction Effects in the Lake Washington Area

Construction effects associated with the project elements in Options A, K, and L would result in the same level of effects on the social elements in the Lake Washington area; therefore, the discussion of effects does not differentiate among options. There would be no effects on community services, or pedestrian, bicyclist, and transit facilities.

Community Cohesion

Within Medina, properties along the shoreline of Lake Washington and in the hillside above Lake Washington near the new East Approach structure and the bridge maintenance facility would be exposed to noise and negative visual effects associated with the construction activities from the temporary work bridge and barges.

Recreation Facilities

Although there are no formally designated recreation facilities in the Lake Washington area, construction activities would affect people who are on the lake near any construction activities. Construction duration would be at least 33 months. There would be pile-driving activities near the water that would affect users. Temporary work bridges and construction equipment in the area would affect views. These users would include people fishing, as well as motorized and nonmotorized users.

Construction Effects in the Eastside Transition Area

Construction associated with the project elements in Options A, K, and L would result in the same level of effects on all social elements in the Eastside transition area; therefore, the discussion of effects does not differentiate among design options.

Community Cohesion

Residents in Medina would experience fewer construction effects than in Seattle neighborhoods, and the effects would be of a lower level than those experienced in the Seattle neighborhoods because of the lesser extent of construction in the Eastside transition area. Construction



duration would be at least 30 months. Residents north and south of SR 520 would also experience noise effects.

Community Services

There would be no construction effects on schools, religious facilities, social institutions, government facilities, or utilities.

Fire, Emergency Medical, and Police

Construction effects would be minimal along the SR 520 corridor east of Evergreen Point Road and would consist of moving 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. It would require closing travel lanes, so work would likely be performed at night when the roadway is used by fewer vehicles. The lane closures could result in additional travel and response times for public service provider vehicles, including fire, emergency medical, and police. No other affects on social elements are anticipated as a result of these activities.

Pedestrian, Bicyclist, and Transit Facilities

There would be no construction effects on pedestrian and bicycle facilities.

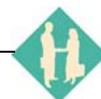
During construction of the East Approach, the freeway transit flyer stops at Evergreen Point Road would be closed for a period of 4 to 6 months. The transit stop is served by King County, Sound Transit, and Community Transit. Coordination between WSDOT and the transit agencies regarding the temporary closure and how to address the issue will continue.

Construction Effects Related to Pontoon Production and Transport

WSDOT is proposing to construct pontoons for the I-5 to Medina: Bridge Replacement and HOV Project at the existing CTC site in Tacoma and at a new pontoon construction site in Grays Harbor County.

The pontoon production for the proposed project would not result in social effects at the CTC site because there are no social elements in its vicinity.

Pontoon construction would not result in negative effects on the social elements at either of the pontoon construction site alternatives located



in Grays Harbor County. The proposed project would benefit the Grays Harbor County area by providing a new source of employment during pontoon production. If the Anderson & Middleton site is selected, the noise levels associated with operating the facility would exceed the noise abatement criteria levels and affect residents north of the site in downtown Hoquiam; however, with the mitigation proposed, there would be no effects related to noise. Refer to Pontoon Construction Project Draft EIS Social Elements Technical Memorandum (WSDOT 2009l) for more information.

Transporting pontoons from the moorage locations to Lake Washington is not expected to result in any effects on social elements because no social elements are located in the water bodies. The transport may affect recreation users in the water bodies, especially as the pontoons are transported through the Montlake Cut, but these effects would be temporary.

Construction Effects Related to the Phased Implementation Scenario

This section describes the construction effects that would occur if the proposed project is constructed in phases. Refer to the What are the Project Alternatives? section for more information.

Neighborhoods in the Seattle Study Area

The Phase Implementation scenario would delay construction improvements in the I-5 area and parts of the Montlake area, so the construction effects on the adjacent neighborhoods – Eastlake, North Capitol Hill, Portage Bay/Roanoke, Montlake, and the University District – would be less in the short term than if the Phased Implementation scenario is not implemented. Overall, the construction effects would be separated over time as the other phases of the project are implemented, with many of the residents experiencing a longer construction period. The effects of the Phased Implementation scenario on the neighborhoods in the study area are discussed below.

Eastlake

Construction associated with the project elements in Options A, K, and L would have the same level of effects on the social elements in the Eastlake neighborhood. The Eastlake neighborhood would not be affected during the high-priority phase of the Phased Implementation scenarios because none of the project elements associated with high-priority parts of the project are located in the neighborhood or result in any effects. The portion of the neighborhood in the study area would



not experience any construction effects until later construction phases, including the negative effects on the TOPS School associated with constructing the I-5/East Roanoke lid.

North Capitol Hill

Construction associated with the project elements in Options A, K, and L would cause the same level of effects on the social elements in the North Capitol Hill neighborhood. The North Capitol Hill neighborhood would be affected during the high-priority phase of the Phased Implementation scenario because of the safety considerations related to the new bridge for Delmar Drive East. Construction activities would require Delmar Drive Bridge closure for approximately 9 months and would result in the effects described in the North Capitol Hill in Construction Effects by Neighborhood in the Seattle Study Area section. These effects would be limited to those adjacent to the detour route and would be experienced by people who normally drive on Delmar Drive East. The duration of the effects would be 9 months, compared to the 27 months associated with the 10th Avenue East and Delmar Drive lid.

Portage Bay/Roanoke

Construction associated with the project elements in Options A, K, and L would result in the same level of effects on the social elements in the Portage Bay/Roanoke neighborhood. Construction related to the Portage Bay Bridge would last at least 42 months. Residents in the neighborhood would experience noise associated with pile driving, which would be completed during the early phase of the Phased Implementation scenario. Residents would also be affected by the detour route associated with the closure of Delmar Drive East and experience effects like those described above in the North Capitol Hill section. The effects on fire, emergency medical, and police and utilities would be the same as described above under Portage Bay/Roanoke in Construction Effects by Neighborhood in the Seattle Study Area.

Montlake

The areas of the Montlake neighborhood affected under the early phase of the Phased Implementation scenario include areas near the Portage Bay Bridge and the West Approach. Construction duration would be at least 42 months and up to 54 months, depending on design option, resulting a construction duration that would be shorter by 24 to 36 months than if the proposed project is built without the Phased Implementation scenario. This is because of the longer construction durations associated with the project elements that would be part of



later construction phases (i.e., new Montlake interchange at SR 520, lids at Montlake, and tunnel). Additionally, because all of the project elements would not be constructed together under the phased scenario, there is the potential for fewer truck trips and a reduced intensity associated with the construction effects. Residents in the Montlake neighborhood would experience noise associated with pile driving, which would be completed during the early phase of the Phased Implementation scenario. Without the lids construction in the Montlake interchange area, there would be no effect on the water main and sewer lines located along Montlake Boulevard. The Lake Washington Boulevard ramps would remain open until later construction phases to provide capacity to handle traffic operations. Transit users in the area would not be affected by relocating the Montlake Transit Stop because project elements would not be constructed until a later phase.

Overall, residents and recreational users would experience a longer construction period under the Phased Implementation scenario. The area would be affected once construction starts on the remaining improvements, and those construction effects would be greater because construction would occur in an overall shorter timeframe without the Phased Implementation scenario. Each construction phase under the Phased Implementation scenario would require another mobilization phase. Residents and recreation users would experience negative noise, dust, visual, and traffic effects associated with construction, and these effects would occur for longer durations under the Phased Implementation scenario.

Option A

Because the new bascule bridge would not be constructed during the early phase of the Phased Implementation scenario, there would be fewer initial negative effects on the residents in proximity to this project element. The effects associated with the new bascule bridge would occur in the longer term as part of the later phases. The gasoline station at the Montlake interchange would not need to be relocated and would continue providing service to neighborhood residents until the later phases when it would need to be relocated.

Option K

Without the construction of the project elements in the Montlake area, there would be no negative effects on the residents in the northeast portion of Montlake associated with the tunnel. The effects associated with the project elements would occur in the longer term for the elements constructed as part of the later phases. Residents would be affected by



construction activities twice, including the users of the Washington Park Arboretum and East Montlake and McCurdy Parks. These facilities would be affected during the early phase of the Phased Implementation scenario to construct project elements and then again during later phases, resulting in an overall longer construction duration and greater level of effects.

Option L

Effects would be similar to those described above under Option K.

University District

Construction associated with the project elements in Options A, K, and L would have the same level of effects on the social elements in the University District neighborhood. The University District neighborhood would not be affected during the early phase of the Phased Implementation scenario because none of the project elements associated with this high-priority phase would be located in the neighborhood or cause any effects. The portion of the neighborhood in the study area would not experience any of the construction effects described above until later phases.

Option K

There would also be no effects related to relocating transit stops or to passengers of the Sound Transit Husky Station because the project elements would not be constructed until a later phase.

Option L

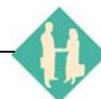
Effects would be similar to those described above under Option K.

Madison Park

Construction associated with the project elements in Options A, K, and L would have the same level of effects on the social elements in the Madison Park neighborhood. The Madison Park neighborhood would be affected during the early phase of the Phased Implementation scenario, and the effects would be the same as those described above for Madison Park in the Construction Effects by Neighborhood in the Seattle Study Area section.

Laurelhurst

Construction associated with the project elements in Options A, K, and L would have the same level of effects on the social elements in the Laurelhurst neighborhood. The Laurelhurst neighborhood would be affected under the early phase of the Phased Implementation scenario, and the effects would be the same as those described above for



Laurelhurst in the Construction Effects by Neighborhood in the Seattle Study Area section.

Lake Washington Area

Construction associated with the project elements in Options A, K, and L would have the same level of effects on the social elements in the Lake Washington Area. The Lake Washington Area would be affected under the early phase of the Phased Implementation scenario, and the effects would be the same as those described above for the Lake Washington Area in the Construction Effects in the Lake Washington Area section.

Eastside Transition Area

Construction associated with the project elements in Options A, K, and L would have the same level of effects on the social elements in the Eastside transition area. The Eastside transition area would be affected under the early phase of the Phased Implementation scenario, and the effects would be the same as those described above for the Eastside transition area in the Construction Effects in the Eastside transition area section.

How would operation of the project affect social elements?

No Build Alternative

Under the No Build Alternative, none of the improvements discussed in the *What are the Project Alternatives?* section would be constructed. Areas originally bisected during the construction of I-5 and SR 520 would not be reconnected, and no improvements in transit and HOV travel times, noise level reduction for residences and recreation facility users adjacent to SR 520, nor improvements to pedestrian and bicyclist facilities would occur. The No Build Alternative would not require the acquisition of any properties, precluding any effects on these properties.



6-Lane Alternative

Common Operation Effects in the SR 520 Corridor Study Area

Community Cohesion

Project operation would result in several beneficial effects for the neighborhoods in the study area. The proposed project footprint would be kept as narrow as possible to minimize effects on the adjacent neighborhoods, and the project profile would also be kept as low as possible. However, in certain areas, the proposed widened project corridor would involve improvements that would bring transportation-related elements closer to some residences. The low profile in some design options would both improve views for residents and bring the transportation-related elements closer to recreation users.

The I-5 to Medina: 520 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. All of the build options would require property acquisitions and the relocation of at least three single-family residences; however, these relocations are not anticipated to affect community cohesion because of the low number of relocations and because the relocations are not all in one neighborhood. Although the project would require property acquisitions, it would not create a new corridor or result in any land use changes in the study area. Exhibit 20 illustrates the number of relocations that would be required for each option. Refer to the Land Use, Relocations, and Economics Discipline Report (WSDOT 2009o) for more information on acquisitions and relocations.

Exhibit 20. 6-Lane Alternative Property Acquisitions and Relocations

Option	Residential	Business	Civic and Quasi-public	Total Acquisitions and Relocations
Option A	5	1	1	7
Option K	3	0	1	4
Option L	3	0	1	4

Proposed project operation 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 (WSDOT 2009m).

The new physical connection of the project lids in three locations (i.e., I-5/East Roanoke Street, 10th Avenue East and Delmar Drive East, and the Montlake vicinity) are shown in Exhibits 21 and 22.

The lids would result in beneficial changes to social patterns by reconnecting neighborhoods originally bisected by constructing I-5 and SR 520. The lids would include green open spaces, landscaping, and pathways, allowing area residents the opportunity to gather and interact with one another and enhance existing access or provide safe access across the major roadways. Information from the SR 520 Health Impact Assessment: A Bridge to a Healthier Community (King County 2008), indicates that the lid would provide multiple health benefits by allowing people to connect in easily accessible and safe areas. Green space can enhance people's ability to cope with and recover from stress.

The green space on the lids would also allow people to observe nature, which can restore concentration and improve productivity. Finally, the SR 520 Health Impact Assessment describes how the green space can bring diverse groups together and how people in neighborhoods with green space are more likely to enjoy stronger social ties than those who live in areas surrounding by concrete.

Art would be incorporated into the design, with input from the surrounding neighborhoods. Visual effects would improve for many area residents, as they would have a less expansive view of the major roadway.

Noise modeling indicates that operating the proposed project would result primarily in beneficial effects on noise levels in the neighborhoods. As shown in Exhibit 23, the number of residences overall that exceed the noise abatement criteria (NAC) would decrease from 319 under the No Build Alternative to 278 to 291 depending on the design option selected.

Noise walls are considered under Option L and may be included under Option A. Adding noise walls would result in negative visual effects for residents in close proximity to the barriers because of the height of the noise walls. These effects include eliminating views because of the height of the noise walls and because, for some residences, the roadway would become more visible.

Noise Abatement Criteria

Noise abatement criteria are noise standards that specify exterior noise levels for various land activity categories. For residences, parks, schools, churches, and similar uses, the noise abatement criterion is 67 A-weighted decibels at the sensitive receptor.





Overhead view of existing conditions at Montlake Boulevard Interchange



Option A



Option K

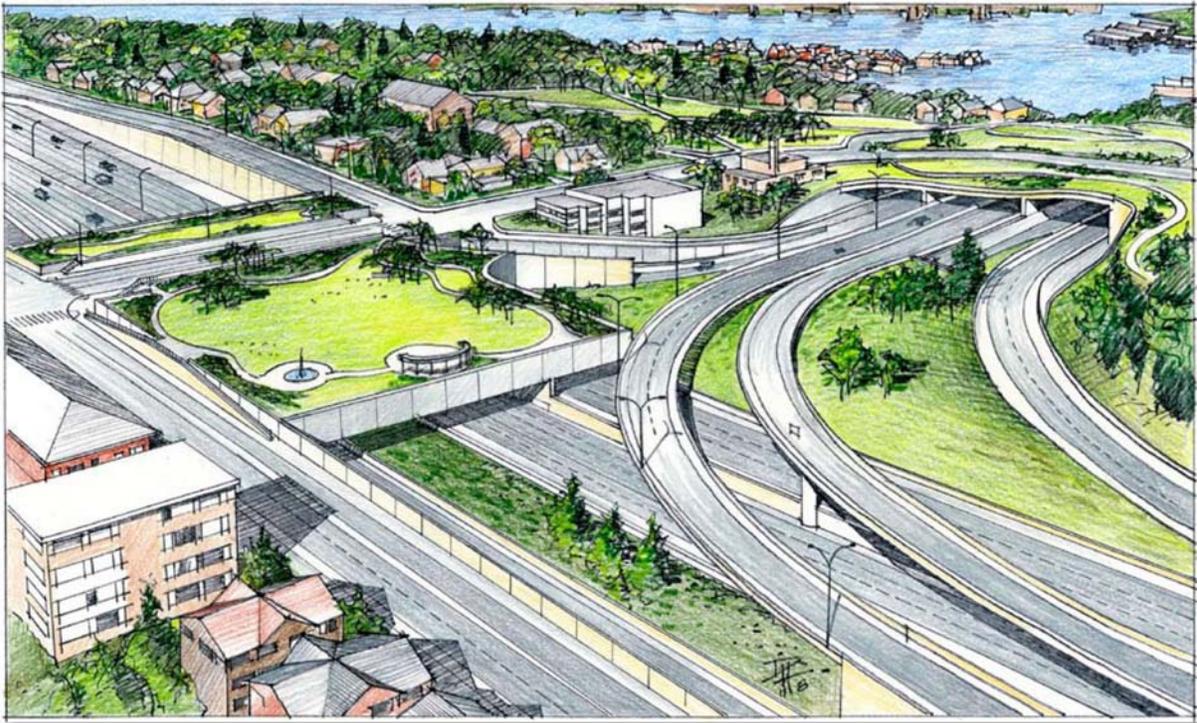


Option L

Source: Westside Urban Design Report
(WSDOT, January 16, 2009)



**Exhibit 21. Potential Lids at I-5/Roanoke
and 10th Avenue/Delmar Drive East**
I-5 to Medina: Bridge Replacement and HOV Project



Bird's eye perspective of I-5/Roanoke and 10th Avenue/Delmar lids looking northeast



Overhead view of existing conditions at the intersection of I-5 and SR 520

Source: Westside Urban Design Report (WSDOT, January 16, 2009)

Exhibit 22. Conceptual Lid at I-5/East Roanoke

Exhibit 23. Number of Residences Where Noise Levels Would Exceed the NAC^a

Neighborhood	Existing	No Build Alternative	6-Lane Alternative		
			Option A	Option K	Option L
Portage Bay/Roanoke	23	23	26	27	27
North Capitol Hill	99	109	89	89	83
Montlake – North of SR 520	37	47	28	28	28
Montlake – South of SR 520	63	70	57	52	45
University District	0	27	9	9	9
Madison Park	16	16	10	10	10
Laurelhurst	0	0	0	0	0
Medina	23	27	21	21	21
Total	261	319	240	236	229

^a The numbers shown indicate effects without the noise walls added as mitigation.



Refer to the Visual Quality and Aesthetics Discipline Report (WSDOT 2009n) for more information on visual effects associated with the noise walls.

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, and at three receivers, the increase would be 3 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. See below in the Operation Effects by Neighborhood in the Seattle Study Area section for more information on noise effects in the neighborhoods. Refer to the Noise Discipline Report (WSDOT 2009c) for further information on noise effects in the study area.

Regional and Community Growth

Operation of the proposed project for Options A, K, and L would not result in any effects on community growth. The project would displace three to five single-family residences, depending on the option selected, but this would not result in any changes in growth trends in the study area. 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 operation of the project 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

Operation would result in 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 recreational facility available to users in both the study area and the region. Exhibit 24 lists permanent acquisition effects that constructing the project would have on recreation facilities in the study area, and there would be the potential for proximity 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 (WSDOT 2009i) for more information.

Sounds expressed in terms of *dBA* provide a single number measure of a sound's **loudness** based on the ear's sensitivity to different **frequencies**.



Exhibit 24. Permanent Acquisition Effects on Parks (acres)

Resource	Neighborhood	Option A	Option K	Option L
Bagley Viewpoint	Portage Bay/Roanoke	0.15	0.15	0.15
East Montlake Park	Montlake	2.8	4.5	4.3
McCurdy Park	Montlake	1.5	1.5	1.5
Washington Park Arboretum	Montlake	0.9	1.4	0.6
University of Washington Open Space	University District	0.2	0	0.5
Total Acquisition		5.55	7.55	7.05

Community Services

Operation the proposed project under Options A, K, and L would not cause any effect on the religious institutions, social institutions, government facilities, or utilities in the study area. Effects on other community services are described below.

Fire, Emergency Medical, and Police

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 full shoulders, which would provide options for these public service vehicles to bypass traffic and reach incidents faster. The shift in mode from single 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.

Pedestrian, Bicyclist, and Transit Facilities

The project would have beneficial effects for pedestrians, bicyclists, and transit riders. The project does not result in any negative changes to pedestrian, bicyclist, or transit facilities access to any of the community services in the study area. The new, continuous pedestrian and bicycle path would extend across Lake Washington, creating a new nonmotorized 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, resulting in more healthy neighborhoods. The lids at I-5, 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.



Transit, carpools, and vanpools would all realize improvements in travel times due to the addition of HOV lanes 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 between 3 to 4 minutes in the a.m. peak period and 26 to 28 minutes 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. The project would decrease reliance on single-occupant vehicles because of travel-time savings in other travel modes and encourage the use of transit and other alternative travel modes. The project would enhance public safety with the increased shoulder widths along the corridor. Transit users would have easier access to transit along SR 520 with the direct transit access. Removing the Montlake Freeway Station would result in buses destined for or originating from I-5 continuing on SR 520 without exiting at the SR 520/Montlake Boulevard NE interchange. For both westbound and eastbound transit riders, access to SR 520 bus services in the area would change. Riders may need to catch a different bus, transfer to another bus, or use light rail. University District bus routes would continue to operate with direct service as they do under existing conditions. Addition information on transit improvements is provided in the Operation Effects by Neighborhood in the Seattle Study Area section. Refer to the Transportation Discipline Report (WSDOT 2009k) for more information related to transit improvements and how the functions would change from removing the Montlake Freeway Station.

Operation Effects by Neighborhood in the Seattle Study Area

This section describes operation effects that would occur within the neighborhoods in the study area.

Eastlake

Operations associated with the project elements in Options A, K, and L would have the same level of effects on the social elements in the Eastlake neighborhood. Because there would be no difference in the operation effects within the Eastlake neighborhood among the options, the discussion of effects does not differentiate among the design options. There would be no effects associated with recreation facilities, community services, or transit facilities.



Community Cohesion

The I-5/East Roanoke Street lid would provide a new area for nearby residents to gather and interact, resulting in beneficial effects as described above in the Common Operation Effects in the SR 520 Corridor Study Area section.

Recreation Facilities

The lid at I-5 would include new open space for users, including open space with grassy areas and pathways.

Pedestrian and Bicyclist Facilities

The lid at I-5 would include pathways to improve connectivity and enhance the existing route for pedestrians and bicyclists.

North Capitol Hill

There would be no effects associated with any of the community services or transit facilities.

Community Cohesion

The 10th Avenue East and 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. As shown in Exhibit 23, noise levels would decrease compared to the No Build Alternative. The 10th Avenue East and Delmar Drive East lid would reduce noise levels. In most locations where the NAC is exceeded, the change in noise levels would be a slight reduction compared to the No Build Alternative, no change, or the changes would not be perceptible.

Option A

If noise walls are included, 35 residences would exceed the NAC, a decrease of 54 residences compared to existing conditions, with a reduction in noise level of up to 15 dBA.

Option K

Noise walls are not proposed under Option K, so there would be no additional effects related to noise.

Option L

Compared to Options A and K, Option L would result in six fewer residences exceeding the NAC, without constructing noise walls. Noise walls would be included and would reduce the number of receivers exceeding the NAC to 35, a decrease of 48 receivers compared to existing conditions, with noise level reductions up to 16 dBA.



Recreation Facilities

The 10th Avenue East and Delmar Drive East lid would create new open space and grassy areas for residents in the surrounding area. As described above, the lid would reduce noise levels in the area.

Pedestrian and Bicycle Facilities

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. As described above, the lid would reduce noise levels in the area.

Portage Bay/Roanoke

There would be no effects associated with any of the community services or transit facilities. Effects on other social elements are described below.

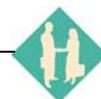
Community Cohesion

The I-5/East Roanoke Street lid would provide a new gathering location for nearby residents to interact, and the 10th Avenue East and Delmar Drive East lid would provide new connections to the North Capitol Hill and Montlake neighborhood, resulting in the beneficial effects described above in the Common Operation Effects in the SR 520 Corridor Study Area section. The Bagley Viewpoint would be redesigned as part of the 10th Avenue East and Delmar Drive East lid, restoring the function of the viewpoint without resulting in any long-term effects on views. Noise walls on SR 520 on the Portage Bay Bridge would affect views for some residents who live by the roadway, because the addition of the noise walls would make it more visible.

As illustrated in Exhibit 23, noise levels would increase compared to the No Build Alternative. The increase in noise levels is related to traffic noise from I-5 and East Roanoke Street. For the areas where noise levels would increase compared to the No Build Alternative, the change ranges from 3 to 6 dBA, which is a perceptible change. 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.

Option A

Compared to Options K and L, Option A would result in one fewer residence exceeding the NAC (Exhibit 23) without constructing noise walls. Noise walls would potentially be used for noise mitigation under Option A, and effects would be similar to Option L, under which noise walls are considered as mitigation; however, the number of residences



exceeding the NAC would be 13, a decrease of 13 compared to the project without the noise wall, which is slightly better than Option L.

Option K

Noise walls are not proposed under Option K, so there would be no additional effects related to noise.

Option L

Noise walls would be included under Option L and would reduce the number of receivers exceeding the NAC to 16, a decrease of 11 receivers compared to the project without the noise wall, with up to a 19-dBA reduction in noise. Adding the noise walls would make the roadway appear more visible when seen from outside the roadway.

Recreation Facilities

Although the Bagley Viewpoint would be permanently affected (see Exhibit 24), a new viewpoint would be incorporated into the 10th Avenue East and Delmar Drive East lid, maintaining similar views for users.

Pedestrian and Bicyclist Facilities

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

Most of the effects associated with Options A, K, and L would occur within the Montlake neighborhood.

Community Cohesion

Adding the lid at Montlake 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 in the SR 520 Corridor Study Area section. 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.

As illustrated in Exhibit 23, the noise levels for a number residences north and south of SR 520 would improve compared to the No Build Alternative. For residences that would still exceed the NAC, many of the receivers would realize 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.

Option A

Option A would require two additional residential relocations, for a total of three single-residence acquisitions. Relocating these residences would not result in any affects on community cohesion in Montlake because so few residences are affected compared to the total number of residences in the neighborhood. Construction would also require acquiring a gas station in the Montlake neighborhood, which is a unique business to the neighborhood because it is the only gas station in an approximate 1-mile radius, and it provides convenient service to the residents.

If the Lake Washington Boulevard ramps are not constructed as part of the Option A suboptions, traffic and noise would decrease through the Washington Park Arboretum, which would benefit nearby residents' quality of life. No negative effects are anticipated from the proposed improvements along Montlake Boulevard. Refer to the Transportation Discipline Report (WSDOT 2009k) for more information.

Overall, Option A would result in the greatest number of residences exceeding the NAC compared to the other design options (Exhibit 23). With the potential addition of noise walls, 24 residences would exceed the NAC, a decrease of 61 receivers and up to a 14-dBA reduction in noise compared to the conditions without the noise wall. With noise walls, Option A would result in the lowest number of residences that would exceed the NAC.

Option K

In addition to the Montlake lid, two additional, smaller lid-like structures are associated with Option K: one across East Lake Washington Boulevard in the Montlake neighborhood and the other located at the NE Pacific Street and Montlake Boulevard NE interchange in the University District. The lower profile of the option would improve the visual environment for adjacent residents.

No noise walls are proposed under Option K, so there would be no additional effects related to noise.

Option L

Without constructing noise walls, Option L would result in the lowest number of residences that would exceed the NAC, compared to Options A and K. With the proposed noise walls, the number of



residences exceeding the NAC would be 42, a decrease of 31 compared the No Build Alternative, and noise levels would decrease as much as 10 dBA.

Recreation Facilities

Positive effects would include removing the R.H. Thomson Expressway ramps in the Washington Park Arboretum, which would improve the visual experience of users by removing an urban feature. Noise levels would also improve in the Arboretum as a result of noise walls that could be constructed. The project would result in the permanent loss of between 5.2 and 7.4 acres of recreational area, depending on the build option (Exhibit 24). However, for McCurdy Park, demolishing the MOHAI building and constructing the wetland stormwater facility would reduce the overall negative effect of land acquisition. Refer to the Recreation Discipline Report and Land Use, Economics, and Relocations Discipline Report (WSDOT 2009i and 2009o) for more information on the relocation effects related to the MOHAI facility.

Option A

If the Lake Washington Boulevard ramps are not constructed as part of the Option A suboptions, traffic and noise would decrease through the Washington Park Arboretum, which would benefit Arboretum users. Option A would result in the lowest loss of recreation facility property (Exhibit 24).

Option K

In addition to the effects identified above, Option K would result in greatest loss of parklands, with the permanent acquisition of 7.55 acres (Exhibit 24). The option would also include a land bridge over the highway on Foster Island, which would improve pedestrian connections. This option would include vegetation, but the vegetation would take some time to develop to the point where it would have natural feel.

Option L

Recreation effects would be greater than those of Option A and slightly less than for Option K (Exhibit 24). However, Option L does not include a land bridge on Foster Island.

Community Services

Operating the proposed project would not result in effects on schools, religious institutions, social institutions, or government facilities in the Montlake neighborhood. Potential effects on other community services are described below.



Fire, Emergency Medical, and Police

The loss of the Lake Washington Boulevard ramps could result in longer response and travel times as vehicles would need to travel through Montlake neighborhood to reach incidents in the area south of SR 520 and in proximity to Lake Washington Boulevard.

Pedestrian, Bicyclist, and Transit Facilities

Operating the proposed project would result in beneficial effects for pedestrians, bicyclists, and transit users in the Montlake neighborhood. The new, continuous pedestrian and bicycle path would extend across Lake Washington, creating a new nonmotorized link, both locally and regionally. The lid would include pathways to improve connectivity and provide access across SR 520, improving safety for pedestrians and bicyclists. Removing the Montlake Freeway Transit Station would require some residents south of SR 520 to travel farther north to access transit stops to reach their destination, find an alternate route, or use their same method to access light rail at the Husky Stadium Station. However, the project does result in improvements in connections between transit services and other transportation modes. Refer to the Transportation Discipline Report (WSDOT 2009k) for more information related to transit improvements and improved transit travel times.

Option A

There would be no additional effects on pedestrians and bicyclists beyond those described above. The addition of the new bascule bridge would benefit buses by reduced congestion and delay, and the bus stop located at the end of the transit-only westbound off-ramp would enable riders to transfer to other buses, including those traveling south of SR 520. In addition, a transit stop for eastbound riders would be located at the entrance to the eastbound SR 520 on-ramp.

Option K

In addition to the effects on pedestrians, bicyclists, and transit described above, Option K includes two additional lid-like structures, including one in the Montlake neighborhood that would provide safe access for pedestrians and bicyclists across the roadway. The direct access ramps to and from SR 520 at the new interchange would allow buses to bypass general-purpose traffic on the SR 520 ramps and mainline. For Montlake residents who live south of SR 520, longer travel times or out-of-direction travel would be required for them to access the transit stops that provide access to SR 520. The transit stops on or near the Montlake overcrossing of SR 520 would likely be retained to maintain access to the local routes.



Option L

Option L would result in similar effects on transit as those described under Option K.

University District

There would be no effects associated with community cohesion or pedestrian, bicyclist, and transit facilities.

Recreation Facilities

Operating the proposed project would result in the loss of between 0 and 0.5 acre of University of Washington open space (Exhibit 24). Additional users may experience noise and visual effects because of new project elements. Nine areas would exceed the NAC near recreation facilities, including the University of Washington Athletic Building, after construction. However, at most locations where the NAC would be exceeded, noise levels would decrease between 3 and 10 dBA, which would be perceptible differences. In the other areas, the differences would not be perceptible. There are no differences in noise levels among the design options.

Option A

Option A would result in the loss of 0.2 acre of University of Washington open space associated with constructing the new bascule bridge.

Option K

Option K, with no permanent loss of University of Washington open space, would have the least University of Washington open space effect because the tunnel would pass underneath it. After construction, the University of Washington Waterfront Activity Center would be reconstructed at its current location.

Option L

Option L would have the most loss of University of Washington open space area, with the permanent loss of 0.5 acre of land.

Community Services

Operation of the proposed project would not result in effects on religious institutions; social institutions; government facilities or fire, emergency medical, or police. Services that would be affected are described below.

Schools

As described above in the Common Operation Effects in the SR 520 Corridor Study Area section, under Pedestrian, Bicyclist, and Transit



Facilities, a number of improvements to nonmotorized facilities would benefit people attending the University of Washington. Improvements to transit would improve travel times to the University.

Pedestrian, Bicyclist, and Transit Facilities

As described above in the Common Operation Effects in the SR 520 Corridor Study Area section, under Pedestrian, Bicyclist, and Transit Facilities, a number of improvements to nonmotorized facilities would benefit people attending the University of Washington. Improvements to transit would improve travel times to the University. Options K and L both include a lid-like structure at the NE Pacific Street and Montlake Boulevard NE interchange, resulting in benefits for pedestrians and bicyclists by allowing safe passage over the roadway.

Madison Park

There would no effects during operation of the proposed project associated with recreation facilities; community services; or pedestrian, bicycle, and transit facilities. Effects to community cohesion are described below.

Community Cohesion

As illustrated in Exhibit 23, the noise levels at six additional residences would perceptibly improve compared to the No Build Alternative. For the remaining residences, noise levels would decrease by 1 to 2 dBA, a change that is not perceptible to most people.

Option A

With the proposed noise walls, no residences would exceed the NAC, and noise levels would decrease up to 11 dBA compared to the No Build Alternative. Without the potential noise walls, 10 residences would exceed the NAC.

Option K

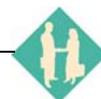
Noise walls are not proposed under Option K, so there would be no change in the noise levels.

Option L

With the proposed noise walls, no residences would exceed the NAC, and noise levels would decrease up to 11 dBA compared to the No Build Alternative. Without the potential noise walls, 10 residences would exceed the NAC.

Laurelhurst

Operations associated with the project elements in Options A, K, and L would result in the same level of effects on the social elements in the



Laurelhurst neighborhood; therefore, the discussion of effects does not differentiate among design options. No operational effects of the proposed project would occur that are associated with recreation facilities; community services; or pedestrian, bicycle, and transit facilities. Effects to community cohesion are described below.

Community Cohesion

Noise levels in Laurelhurst 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.

Operation Effects in the Lake Washington Area

Operations associated with proposed project elements in Options A, K, and L would result in the same level of effects on the social elements in the Lake Washington area. Because there would be no difference in the operation effects within the Lake Washington area, regardless of the option selected, the discussion of effects does not differentiate among design options. There would be no effects associated with recreation facilities. Potential effects on community services are described below.

Community Cohesion

The only negative effect on community cohesion with the proposed project operation would be that residents near the bridge maintenance facility might experience visual quality and noise effects.

Community Services

There would no operation effects associated with schools, religious institutions, government facilities, or utilities. There would be a potential positive effect on fire, emergency medical, and police services.

Fire, Emergency Medical, and Police

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 would be the same as those described in the Common Operation Effects in the SR 520 Corridor Study Area section above.



Operation Effects in the Eastside Transition Area

There would be no effects associated with recreation facilities or community services. Social elements that would be affected are discussed below.

Community Cohesion

As illustrated in Exhibit 23, noise levels would improve in the area compared to the No Build Alternative. At many residences where the NAC would be exceeded, noise levels would actually decrease compared to the No Built Alternative.

Option A

With the potential addition of noise walls, no residences would exceed the NAC, and noise levels would decrease up to 19 dBA compared to the No Build Alternative. Without the noise walls, 21 residences would exceed the NAC.

Option K

Noise walls are not proposed under Option K, so there would be no change in the noise levels.

Option L

With the proposed noise walls, no residences would exceed the NAC, and noise levels would decrease up to 19 dBA compared to the No Build Alternative. Without the noise walls, 21 residences would exceed the NAC.

Pedestrian, Bicyclist, and Transit Facilities

Benefits to pedestrians, bicyclists, and transit users would be the same as those described above in the Common Operation Effects in the SR 520 Corridor Study Area section.

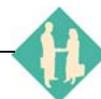
Operation Effects Related to Pontoon Production and Transport

Once the bridge is built and the pontoons are in place, there would be no effects related to pontoon production and transport.

Operation Effects Related to the Phased Implementation Scenario

Neighborhoods in the Seattle Study Area

As described above, the early construction phase of the Phased Implementation scenario would not include some proposed improvements in the I-5 area and portions of the Montlake area.



Therefore, the Phased Implementation scenario would result in less operational effect on the adjacent neighborhoods of Eastlake, North Capitol Hill, Portage Bay/Roanoke, Montlake, and the University District. Under the Phased Implementation scenario, the high-priority early phase would involve the improvements that would affect the Madison Park and Laurelhurst neighborhoods; therefore, no other effects would occur beyond those described in the Operation Effects by Neighborhood in the Seattle Area section. The effects of the Phased Implementation scenario on the neighborhoods in the study area are discussed below.

Eastlake

Community Cohesion

Residents would realize the benefits associated with the proposed lids and connections sooner if the Phased Implementation scenario is implemented; without the Phased Implemented scenario, the opportunities to interact would be delayed.

North Capitol Hill

Community Cohesion

The effects would be the same as those described under Eastlake.

Portage Bay/Roanoke

Community Cohesion

The effects would be the same as those described under Eastlake.

Montlake

With all options, the Lake Washington Boulevard ramps would need to be closed during the construction of the west approach. Once construction has been completed, the ramps would remain and would not be removed until later phases of construction. Traffic would be detoured to the Montlake area during the closure. Improvements on Montlake Boulevard East would occur before the ramps are closed to minimize delays and queuing in the interchange area. The improvements would minimize the negative effects on the local street network in the neighborhood.

Community Cohesion

The effects would be the same as those described under Eastlake.

Recreation Facilities

There would initially be fewer permanent park effects under Options K and L; however, residents would not receive the benefit of the open space located on the lids as soon. The R. H. Thomson Expressway ramps would remain in place until later phases of construction, and



recreation uses would have the continuing visual quality effect of these ramps.

Community Services

Public service vehicles would not receive the benefit of a continuous HOV lane until all phases are complete, and effects on travel and response times between Montlake and I-5 may not improve as soon.

Pedestrian, Bicyclist, and Transit Facilities

Pedestrians and bicyclists would still benefit from the continuous pedestrian and bicycle path, but would not realize any benefits associated with the lids. The residents who use transit would not receive the benefits of improved travel time using the bus because of the direct access and continuous HOV lanes would not be implemented.

University District

Recreation Facilities

There would be no park effects due to the loss of recreation areas because project elements would not be constructed under this phase.

Community Services

Schools

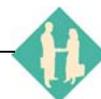
People attending the University of Washington would realize the benefits associated with the continuous pedestrian and bicycle path, but other nonmotorized and transit improvements would not be realized because certain project elements would not be constructed during this phase.

Lake Washington Area

With the Phased Implementation scenario, the high-priority early phase would construct the improvements that would affect the Lake Washington area, and no other effects would occur beyond those described in the Operation Effects in the Lake Washington Area section.

Eastside Transition Area

With the Phased Implementation scenario, the high-priority early phase would construct the improvements that would affect the Lake Washington area, and no other effects would occur beyond those described in the Operation Effects in the Lake Washington Area section.



Mitigation

The project would include measures to avoid or minimize negative effects in the study area.

What has been done to avoid or minimize negative effects?

The design process considered several measures to minimize the effects on the neighborhoods in the study areas. These measures could include the following:

- Keeping the project primarily within existing WSDOT right-of-way and minimizing acquisitions and encroachment into surrounding neighborhoods
- Minimizing, as much as possible, any land acquisitions that may be required, especially where it would result in negative effects on residential property
- During construction, keeping SR 520 open to four lanes of traffic at most times, thereby maintaining access for transit and public service vehicles
- Establishing required detour routes in advance
- Implementing improvements in the Montlake interchange would occur before the closure of the Lake Washington Boulevard ramps.

The contractor selected to construct the project would be required to prepare a traffic management plan to be approved by the City of Seattle that would identify measures and practices to minimize construction effects on local streets, property owners, and businesses. The traffic management plan could include the following, as a minimum:

- Details on required street and lane closures (duration and timing)
- Details on haul routes (duration and timing)
- Proposed detours and signing plans (for vehicles, pedestrians, freight, and bicycles)



- Measures to minimize effects on transit operations and access to/from transit facilities (in coordination with transit service providers)
- Traffic enforcement measures, including deployment of police officers
- Coordination with emergency service providers
- Measures to minimize disruption of access to businesses and properties
- Measures to minimize conflicts between construction activities and traffic during events (this may or may not include stopping construction activities during certain hours)
- A public outreach communication plan

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

Construction Mitigation

Potential mitigation strategies to minimize the effects on the surrounding neighborhoods and the social elements include the following:

- Provide the contractor with an incentive for opening the SR 520 westbound HOV lane quickly.
- Require the contractor to minimize or prohibit construction truck trips during peak periods.
- Use barges to transport materials.
- Develop strategies to reduce overall peak period traffic levels on SR 520.
- Provide construction worker shuttle service that would move workers from outlying temporary or permanent parking facilities to the work zones to reduce the number of vehicles entering and leaving the area.

During construction, potential mitigation measures that WSDOT may implement to avoid or minimize construction effects are identified



below. 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, Air Quality, Visual Quality and Aesthetics, and Transportation discipline reports (WSDOT 2009c, m, n, and k).

Community Cohesion

Mitigation measures may include the following:

- Continue 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 study area residents.
- Schedule neighborhood meetings, as often as needed, to keep study area residents informed of any construction activities before and during construction.
- Coordinate with community organizations to provide information about project construction, using their meetings, Web sites, and other communication channels.
- Coordinate with local communities prior to construction to develop strategies to reduce or minimize the effects associated with construction.
- Implement measures to minimize road closures and ensure that detour routes are well-signed.
- Require contractors to provide mufflers on all construction equipment, limit equipment idling, and locate equipment away from sensitive receptors as much as possible.
- Require construction contractors to cover loads to reduce dust and windblown debris and to spray exposed soils with water or other suppressant to reduce dust.
- Comply with local and county policies regarding construction activities to minimize effects on the surrounding neighborhoods.
- Ensure adequate night lighting and easy to read signage is provided as needed in the surrounding neighborhoods.



Recreational Facilities

Mitigation measures may include the following:

- Trails and bicycle routes would be temporarily routed around construction sites to minimize trail closures. Trails would be kept open as often as safely possible.
- Identify and provide signage for detour routes for pedestrian and bicyclist pathways.
- Under Option K, the Waterfront Activity Center would be dismantled and temporary facilities would be provided for boat rentals. After construction is completed, the center would be reconstructed at the original location.

Community Services

Mitigation measures may include the following:

- Coordinate with appropriate law enforcement agencies to implement crime prevention principles, where feasible.
- Notify and coordinate with the fire departments prior to and during construction regarding traffic congestion and road closures to ensure that access to the construction zone is maintained.
- Notify and coordinate with police departments prior to construction to plan for adequate staffing for traffic and pedestrian movement control.
- Notify area businesses and residents of any disruptions or changes to services, if any are required.
- Consider 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.
- Design the preferred alternative to minimize effects on known major utilities and field-verify the exact locations and depths of underground utilities prior to construction.
- Coordinate with the NOAA facility so that any required utility work minimizes the effects on the water utility services.



Pedestrian, Bicyclist, and Transit Facilities

Mitigation measures may include the following:

- Identify and sign the detour routes on bicycle and pedestrian pathways.
- Identify and sign the detour routes for the closures of the Delmar Drive bridge and the Lake Washington Boulevard ramps.
- Clearly mark the stops and provide additional signage to indicate location if temporary transit stops are required.
- Make stops accessible for people with disabilities if there are any alternative routes or temporary transit stops.
- Provide signage and striping, lighting, and barriers between pedestrians/bicyclists and vehicles.
- WSDOT will maintain continuous coordination with transit providers including Sound Transit, King County Metro, and Community Transit.

Operation Mitigation

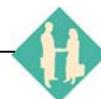
During project operation, potential mitigation measures that WSDOT could implement to avoid or minimize construction effects are identified below.

Community Cohesion

Because the project would result in residences above the NAC, WSDOT considers whether constructed noise barriers are feasible and reasonable. For this project, noise barriers would only be constructed under Option L and are a potential element under Option A. As described above in the Operation Effects section, a number of locations would experience reductions in noise levels with noise barriers. Refer to the Noise Discipline Report (WSDOT 2009c) for detailed information on noise barriers as mitigation.

Additional mitigation measures could include the following:

- Continue to work with local communities and other interested parties on design and landscape treatments associated with the lids.



- Implement FHWA noise abatement requirements by coordinating with residents adjacent to the corridor to determine whether noise walls should be built.

Recreational Facilities

Mitigation measures could include the following:

- Return portions of any recreation facilities used during construction to preconstruction conditions.
- Move trees and other vegetation from the Washington Park Arboretum and save or replant to mitigate effects to vegetation that is removed to accommodate the new structures and detour bridge.
- When converting any Seattle parkland to nonpark use, WSDOT would work with the City of Seattle Department of Parks and Recreation to identify suitable replacement property in accordance with the requirements of Seattle Ordinance 118477.



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