Attachment 8

Range of Alternatives and Options Evaluated

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

Range of Alternatives and Options Evaluated

December 2009

Washington State Department of Transportation

U.S. Department of Transportation
Federal Highway Administration

Contents

Acronyms and Abbreviations ..... **v**
Introduction **1**
Why is this appendix included in the supplemental draft environmental impact statement? 1
What information will I find in this document? 1
What information sources were used to develop this appendix? 2
Range of Alternatives and Options Evaluated: 1998 to 2009 ..... **3**
Overview 3
1998 to 2000—Trans-Lake Washington Study 3
2000 to 2002—Trans-Lake Washington Project 9
2002 to 2005—Transition to SR 520 Bridge Replacement and HOV Project 35
2006—Alternatives Evaluated in the Draft EIS 52
2007 to 2008—SR 520 Mediation Process 68
2009—Development of the SDEIS 74
Progress and Next Steps **79**
References and Bibliography **81**

Attachments

1 Project Development Process – August 2009

2 History of NEPA Process and Alternatives

List of Exhibits

page number

1 I-5 to Medina Project Alternatives Summary Timeline 5

2 Summary of Screening Analysis 13

3 Summary of the Second-Level Screening Process 17

4 Draft EIS 4-Lane and 6-Lane Alternatives from I-5 to Portage Bay 56

5 Draft EIS 4-Lane and 6-Lane Alternatives from Portage Bay to Lake Washington 57

6 Draft EIS Community Ideas for the Design of the Seattle Lids 59

7 Draft EIS Pacific Interchange Option from Portage Bay to Lake Washington 61

8 Draft EIS Second Montlake Bridge and No Montlake Freeway Transit Stop Options 63

9 SDEIS No Build Alternative Cross Section 76

10 SDEIS 6-Lane Alternative Cross Section 76

11 SDEIS Options A, K, and L—Montlake and University of Washington Areas 77

12 SDEIS 6-Lane Alternative at the Evergreen Point Bridge (Common to all Options) 78

Acronyms and Abbreviations

BRT	bus rapid transit
C/D	collector-distributor
CFR	Code of Federal Regulations
Study Committee	Trans-Lake Washington Study Committee
Draft EIS	Draft Environmental Impact Statement
Ecology	Washington State Department of Ecology
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Authority
HCT	high-capacity transit
HOV	high-occupancy vehicle
I-5	Interstate 5
I-90	Interstate 90
I-405	Interstate 405
I-5 to Medina Project	I-5 to Medina: Bridge Replacement and HOV Project
LIC	Local Impact Committee
LOS	level of service
NEPA	National Environmental Policy Act
NOAA Fisheries	National Oceanic and Atmospheric Administration Fisheries (formerly National Marine Fisheries Service)
ROD	Record of Decision
SAC	Signatory Agency Committee
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SAGES	Statewide Advisory Group for Environmental Stewardship

SDEIS	Supplemental Draft Environmental Impact Statement
SEPA	State Environmental Policy Act
SR	State Route
SR 520 Program	SR 520 Bridge Replacement and HOV Program
TDM	transportation demand management
Trans-Lake Project	Trans-Lake Washington Project
Trans-Lake Study	Trans-Lake Washington Study
WSDOT	Washington State Department of Transportation

Introduction

Why is this appendix included in the supplemental draft environmental impact statement?

The purpose of this appendix is to describe the history of alternatives development for the State Route (SR) 520 corridor as it relates to the SR 520, I-5 to Medina: Bridge Replacement and HOV Project (I-5 to Medina Project). This report provides the framework, context, and supporting details for understanding how the I-5 to Medina Project has evolved, screening that has occurred throughout the project to narrow and define the scope of the alternatives, and legislative actions that have influenced the project.

What information will I find in this document?

Most of this discipline report (Appendix Z to the Supplemental Draft Environmental Impact Statement [SDEIS]) provides information about how the I-5 to Medina Project alternatives were developed and how they evolved as the SR 520 Bridge Replacement and HOV Program has progressed. This appendix discusses the alternatives and options in chronological order as much as possible, from the Trans-Lake Washington Study (Trans-Lake Study) in 1998 to the alternatives developed for the SDEIS in 2009. The following sections are included in this report:

- **Range of Alternatives and Options Evaluated: 1998 to 2009** discusses project timelines, sources of information, and the evolution of the alternatives.
- **Progress and Next Steps** provides summary remarks and describes the next steps in project development.
- **References and Bibliography** provides the cited references and other documents used in the preparation of this report.
- **Attachments**

    1. Project Development Process – August 2009
    2. History of NEPA Process and Alternatives

What information sources were used to develop this appendix?

Numerous documents were reviewed and used to prepare this appendix. These documents are listed in the References section of this report.

Four documents were used most frequently to describe the I-5 to Medina Project range of alternatives. These documents include:

- The Trans-Lake Study, which marks the initiation of the current program (Trans-Lake Washington Study Committee 1998, 1999a, and 1999b)
- The SR 520 Bridge Replacement and HOV Project Draft Environmental Impact Statement (WSDOT 2006) and appendices
- SR 520 – Bridge and HOV Project Westside Project Impact Plan (WSDOT 2008)
- Other chapters and appendices of this SDEIS

Range of Alternatives and Options Evaluated: 1998 to 2009

Overview

The following sections describe project timelines, sources of information, and evolution of the alternatives development, including design of SR 520 alternatives that were considered and options evaluated but not selected for further consideration.

Two attachments are included at the end of this appendix. Attachment 1, Project Development Process – August 2009, was developed for the Regulatory Agency Coordination Process and summarizes the project development process. Attachment 2, History of NEPA Process and Alternatives, summarizes the history of alternatives, options, and select legislative direction.

Exhibit 1, I-5 to Medina Project Alternatives Summary Timeline, summarizes the National Environmental Policy Act (NEPA) application process and provides a chronology of the studies performed on the various alternatives.

1998 to 2000—Trans-Lake Washington Study

The Trans-Lake Study was authorized by the State Transportation Commission and funded by the State Legislature in 1997. Its purpose was envisioned as identifying a set of "reasonable and feasible solutions" to improve mobility across and/or around the north end of Lake Washington. Although increasing traffic congestion on SR 520 motivated the study, improvements were considered within an area from Interstate 90 (I-90) on the south to SR 522 on the north, and from west of I-5 to the eastern end of SR 520 (WSDOT 2006).

> 1998–2000 Trans-Lake Washington Study
>
> The initial study is described on pages 4 to 9. This study considered potential project problems and solutions. It outlined options to be considered further for economic, environmental, and design studies prior to initiating the Draft EIS.

The study integrated a wide variety of transportation options into proposed solutions. The options included increased highway and transit capacity, travel demand management, new or enhanced bicycle and pedestrian facilities, and environmental mitigation and

enhancements. Recommended solutions would then be advanced into a phase of more detailed design and study.

The focus was on transportation as a means of access among employment, housing, and activities, and for businesses to move their products and provide services efficiently and reliably while minimizing and mitigating effects and, where possible, enhancing the quality of the neighborhoods, the region, and the environment. In the Trans-Lake Study corridor, transportation is inextricably linked with land use, patterns of growth, and environmental quality (Trans-Lake Washington Study Committee 1999a).

This section provides information about the following Trans-Lake Study topics:

- The Study Committee
- Problem Statement and Potential Solutions
- Trans-Lake Washington Study Recommendations

The Study Committee

Administered through the Washington State Department of Transportation's (WSDOT's) Office of Urban Mobility, the Trans-Lake Study was guided by a 47-member committee. Committee members represented local and regional governments, as well as neighborhood, business and advocacy interests within the Trans-Lake Study corridor.

In May 1998, Washington State's Secretary of Transportation, Sid Morrison, appointed the Trans-Lake Study Committee. Its purpose was to involve all the diverse interests that would be affected by the Trans-Lake Study solutions and the development of those solutions (Trans-Lake Washington Study Committee 1999b).

Problem Statement and Potential Solutions

The goal of the Trans-Lake Study was agreement among interests in the study area on a set of solutions with the potential to improve mobility across and around the lake. To reach this goal required a series of steps. The first step was to develop a problem statement to set the parameters for the study and the criteria to be used in assessing solutions.

Over a 14-month period, the Trans-Lake Study Committee identified four problems that the solutions should address (Trans-Lake Washington Study Committee 1998). Each problem was expected to become more critical in the future. The four problems included:

	Trans-Lake Washington Study	Trans-Lake Washington Project Recommendations Development		Transition to SR 520 Bridge Replacement and HOV Project		Alternatives Evaluated in the Draft EIS		The SR 520 Mediation Process		Development of the SDEIS
	1998 - 2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
No Build	Recommendation: Consider a 'No Build' alternative	'No Action' alternative was recommended for consideration in the Draft EIS.			Because the existing SR 520 Bridges may not remain intact through 2030, the No Build alternative included two scenarios (*described below*) that considered what would happen if the bridges were not replaced.					No Build – continued operation scenario was re-evaluated in the SDEIS. Design life of the Evergreen Point Bridge is estimated at 10 to 15 years; A severe storm could cause it to fail sooner. No Build alternative is inconsistent with WSDOT's safety/reliability standards. Given vulnerabilities of existing bridges, No Build is not a likely scenario.
Catastrophic failure scenario			PROJECT DELAYED due to funding cuts		Under this scenario, both the Portage Bay and Evergreen Point Bridges would be lost.					
Continued operation scenario					Under this scenario, SR 520 would continue to operate as it does today.					
4 Lane **Minimum footprint**	Recommendation: Consider a 'Minimum Footprint' alternative	4-lane alternative was recommended for consideration in the Draft EIS. WSDOT developed two design options (*described below*).								In light of previous studies, 4-lane alternative was not evaluated further in SDEIS.
with High Capacity Transit (HCT) compatibility					Original 4-lane alternative was changed for Draft EIS to include standard shoulders for greater safety/reliability. Option would be designed to accommodate future HCT.		4-lane alternative was identified in Draft EIS as not fully meeting the project purpose and need-- would not adequately improve the movement of people and goods through the corridor.		Additional modeling completed for the SDEIS confirmed that the 4-lane alternative would provide substantially lower mobility than the 6-lane alternative would for both transit and general-purpose traffic.	
with smaller pontoons and no HCT					This option would also include standard shoulders, but would be built using smaller pontoons and would not have the capacity to support high capacity transit.					
6 Lane **Include one HOV lane in each direction, and HCT**	Recommendation: Consider a 6-lane alternative with high capacity transit		Decision was made to use I-90, rather than SR 520, as the region's initial corridor for HCT.	6-lane HCT option not carried forward; 6-lane alternative in Draft EIS would be designed to accomm. HCT in the future.						
Include one HOV lane in each direction, with HCT compatibility		6-lane alternative was refined and recommended for consideration in the Draft EIS. A variety of options were considered for the 6-lane alternative; a total of eight design options (including four Westside options and four Eastside options) were developed for consideration in the DEIS.			Three Westside options for 6-lane alternative are evaluated in Draft EIS (*described below*). This alternative would be designed to accommodate HCT in the future.		Governor Gregoire identified state's preference of 6-lane alternative; recommended further evaluation of bridge design through Seattle, with input from the City and affected communities.	State Legislature passed ESSB 6009, directing formation of a mediation group, comprised of 34 organizations and stakeholders, to prepare a project impact plan (PIP) to address project impacts on Seattle city neighborhoods and parks, and provide a comprehensive mitigation approach. Seattle City Council passed a resolution supporting the preferred alternative identified by Governor Gregoire, and listing design and mitigation measures that should be included.		Mediation group developed and reviewed 12 design options (*described below*). 6-lane alternative with Options A, K, and L, was evaluated in SDEIS.
Tunnel or tube options		WSDOT considered tunnel/tube options. Due to corridor's soil conditions, a tunnel would have to be so deep that highway access would be limited. A tube submerged below the lake could interfere with navigation and fish passage, and create extensive surface disturbance at each end. Therefore, these options were eliminated from consideration.			WSDOT evaluated a partial tunnel project through Seattle. This approach would cause substantial disruption to ecosystems and neighborhoods. Option was eliminated from consideration in the Draft EIS due to high costs (estimated $8 Billion) and environmental impact.					
High lanes with Pacific St. interchange		**Other analysis:** • Transportation Demand Management (TDM) • Cost Estimation Methodology • Interchange Design Analysis • Local Traffic Impact Analysis • Lid Design Options Development • Stormwater Management Analysis • Tolling Studies				Montlake community requested review of a high bridge option in their area. WSDOT ruled out the option due to engineering design issues; large scale cable-stayed or suspension bridge also out-of-character with surroundings. WSDOT/community determined this option would have same footprint and provide same transportation benefits as 6-lane alternative, but have greater visual effects. Option dropped from further consideration.				
with Pacific St. interchange					Option would eliminate existing Montlake interchange, replace with new connection between SR 520, Lake Washington Blvd., intersection of Montlake Blvd. and Pacific St. near UW campus. Adds new bridge crossing Union Bay and Ship Canal, south of Husky Stadium.					
with no Montlake freeway transit stop					Option would eliminate Montlake freeway transit stop. This option would require relocation of existing transit riders and service.					
with second Montlake bridge					Option would include a second drawbridge across Montlake Cut, parallel to existing Montlake Bridge.					
Mediation Options **A** **Redesign Montlake interchange**										Option A maintains existing location of the Montlake interchange and adds new drawbridge over the Montlake Cut.
K **Arboretum and Montlake tunnels**										Option K includes new single-point urban interchange (SPUI) east of existing Montlake interchange. New ramps pass below the SR 520 roadway, with northern leg crossing beneath Montlake Cut in a tunnel.
L **Interchange east of Montlake Blvd. with bridge**										Option L also includes an SPUI, but ramps would rise above SR 520. Northern leg would cross Montlake Cut on diagonal drawbridge.
[Options B - J]	*Redesign Pacific Street interchange; Full tunnel options; Retrofit / transit tunnel; Tunnel from UW to floating bridge; Second Montlake Cut bridge; Tunnel and viaduct; Modified Pacific Street interchange; Retrofit and tunnel to north; Short tunnel interchange*							These options were developed by the mediation group but were not carried forward for further refinement.		
8 Lane **Include one HOV lane in each direction**	Recommendation: Consider an 8-lane alternative with high capacity transit			State Legislature asked WSDOT to reconsider 8-lane alternative. WSDOT conducted second assessment, including three options for I-5 expansion (tunnel, aerial, frontage road)	WSDOT study found that I-5 expansion options were not feasible due to significant impacts to areas adjacent to I-5.	Project area communitites requested that WSDOT re-evaluate the alternative. WSDOT traffic analysis found that alternative would not operate at full capacity by 2030 because congestion at the I-5 and I-405 interchanges would limit use of SR 520.	Due to impacts identified during previous evaluations, the 8-lane alternative was not included for review in the Draft EIS.			

Mediation group agreed to focus on Options A, K, and L.

Exhibit 1. **Range of Alternatives and Options Evaluated Summary Timeline**

I-5 to Medina: Bridge Replacement and HOV Project

1. Land use and transportation systems were planned separately and not integrated in their planning and implementation.
2. The transportation system suffered from extensive congestion.
3. Reliability and safety of the system were impaired.
4. Neighborhoods, business centers, and the environment were affected.

The next step in developing solutions was to identify individual actions, programs, or projects that could contribute to improving mobility. The list of initial concepts, brainstormed by the Study Committee and augmented by public comments, suggested many more possibilities than the obvious ones. The full list included more than 100 transit, roadway, and demand management/land use concepts, as well as concepts for enhancements and mitigation (Trans-Lake Washington Study Committee 1999b).

The ideas generated went far beyond expanding existing bridges. They included car and passenger ferries, new crossings on bridges or submerged tubes, and many high-occupancy vehicle (HOV) and transit options—including various rail technologies such as light-rail and monorail. Demand management measures (for example, tolls, increased parking prices, gas taxes, and transit or carpooling incentives) were included in the mix, along with land-use changes to encourage people to work and shop near their homes and to use alternative modes of travel.

The Study Committee evaluated all of the alternative mobility concepts across the full range of transportation solutions. The result of this analysis was a series of six solution sets in addition to the No Build Alternative. All solution sets included roadway, transit, demand management, and environmental enhancement concepts, but differed on their emphasis. Some solution sets were more focused on roadway and some on transit. Several combinations of HOV and general-purpose lanes were explored, and various solution sets looked at light rail on I-90, SR 520, or both (WSDOT 2006).

Trans-Lake Washington Study Recommendations

One clear conclusion of the Study Committee was that no single action, by itself, would provide an adequate response to the problems. Several actions would be needed that together would provide additional roadway and transit capacity, improve the reliability of the

transportation system, reduce demand for highway travel, and reduce effects of transportation facilities on neighborhoods and the environment (Trans-Lake Washington Study Committee 1999a).

The benefits and tradeoffs of the various solution sets in terms of neighborhoods, parks, endangered species, and other aspects of the built and natural environment were the primary topic of Study Committee discussions early on (Trans-Lake Washington Study Committee 1999b). After the solution sets were fleshed out in some detail, their potential effects could be evaluated, allowing the Study Committee to discuss the relative pros and cons of each. Potential effects were rated in a number of categories, including noise, displacements, arterial traffic, support of local comprehensive plans, physical barriers, park and refuges, Endangered Species Act issues, and air and water quality.

The Study Committee then began the task that was its ultimate charge: deciding on the components of three to four reasonable and feasible solutions to be carried forward for further analysis. In July 1999, after evaluating the solution sets and taking public comments, 44 of the 47 members of the Study Committee adopted a set of recommendations for new transportation elements to be given further study in the framework of an environmental impact statement (EIS) on the SR 520 corridor (Trans-Lake Washington Study Committee 1999b). The Study Committee recommendations included:

- Floating bridge pontoons must be replaced within their maximum remaining 25-year service life.
- Roadway shoulders and bicycle and pedestrian facilities should be considered as part of any new or replaced bridge crossing.
- The EIS should evaluate the following combinations of additional transportation elements in each direction on SR 520:
  - One HOV lane in each direction
  - One HOV lane in each direction and high-capacity transit (HCT)
  - One HOV lane in each direction and one general-purpose lane in each direction
  - One HOV lane in each direction, HCT, and one general-purpose lane in each direction

- The combinations should be evaluated along with No Build and Minimum Footprint Alternatives. The Minimum Footprint Alternative would include maintaining the existing four lanes while improving transit and HOV access to SR 520, bicycle/pedestrian access, and providing for a median barrier and minimum roadway shoulders while maintaining a minimal footprint.
- During the EIS process, each of the options should be more fully specified. Those specifications would identify where added lanes would begin and end, whether the SR 520 corridor is the best option for a cross-lake HCT route, whether and how I-5 and Interstate 405 (I-405) freeway interchanges to SR 520 should be modified, and whether and how arterial connections to SR 520 should be modified, added, or removed.

The Study Committee recognized that a more complete design and a full environmental and financial analysis would be needed to determine which solutions would best address the stated problems (Trans-Lake Washington Study Committee 1999a). However, the committee believed that the set of actions outlined for further consideration had the best potential to be reasonable and feasible of those examined to that point in time. It was recommended that the Trans-Lake Study advance to an environmental effects analysis to provide the basis for selecting a preferred corridor solution.

2000 to 2002—Trans-Lake Washington Project

This section provides information about the following Trans-Lake Washington Project (Trans-Lake Project) topics:

- Initiation of the Environmental Impact Statement
- First Screening Analysis (2000)
- Second-Level Screening Analysis (2001)
- Initial Alternatives Analysis (2001–2002)

2000–2002 Alternatives Considered for the Draft EIS

Consideration of the alternatives suggested by the Trans-Lake Washington Study is described in this discipline report. This work took alternatives through first- and second-level screening analyses, included a transportation demand management evaluation, brought four alternatives forward for consideration, and dropped the 8-lane Alternative from further consideration.

Initiation of the Environmental Impact Statement

Project Committees

The lead agencies for what was then known as the Trans-Lake Project were WSDOT, Sound Transit, the Federal Highway Administration

(FHWA), and the Federal Transit Authority (FTA). Those agencies adopted a leadership model that included three committees to help guide implementation of the Trans-Lake Project and the decisions that would have to be made at key milestones (Trans-Lake Washington Project 2000a). The three chartered committees included:

- **Executive Committee**. Elected officials and agency heads capable of committing their jurisdictions and/or agencies to Trans-Lake Project recommendations. The role of this committee was to recommend alternatives, including a preferred alternative, to lead agencies, using input from other committees and the public. Final Trans-Lake Project selection decisions were to be made by WSDOT management, the Washington State Transportation Commission, the Sound Transit Board, FHWA, and FTA. This committee was also responsible for overseeing outreach to the public.
- **Advisory Committee**. Representatives from neighborhoods, business interests, and transportation advocacy groups with interests in the Trans-Lake Project area. The role of this committee was to advise the Executive Committee and the Technical Steering Committee about the issues and concerns of their constituencies, to review Trans-Lake Project information, provide input on alternatives and the preferred alternative (including input on mitigation and enhancement), and provide advice on effective public involvement for the Trans-Lake Project.
- **Technical Steering Committee**. Appointed representatives from the jurisdictions, tribes with jurisdiction, agencies represented on the Executive Committee, and other resource agencies with regulatory or approval roles in the Trans-Lake Project. The Steering Committee's role was to guide and review the technical progress of the EIS and represent members' jurisdictions and agencies in achieving agreement during scoping. This committee would propose actions and make technical recommendations to the Executive Committee.

Purpose and Need

In June 2000, the Executive and Technical Steering Committees endorsed the Purpose and Need statement for the Trans-Lake Washington EIS (Trans-Lake Washington Project 2000b). The purpose of the proposed action was to improve mobility for people and goods across Lake Washington within the SR 520 corridor from Seattle to Redmond in a manner that would be safe, reliable, and cost-effective

while avoiding, minimizing, and/or mitigating effects on neighborhoods and the environment.

The need for the proposed action was adapted from the Trans-Lake Study problem statement, and was identified as addressing the four problems identified therein (land use and transportation systems not being integrated in their planning and implementation; the transportation system suffering from extensive congestion; reliability and safety of the system being impaired; and neighborhoods, business centers, and the environment being affected).

Notice of Intent

On July 18, 2000, FHWA and FTA, in cooperation with the co-lead agencies WSDOT and Sound Transit, published a Notice of Intent in the Federal Register advertising the preparation of an EIS for improvements to the SR 520 corridor from Seattle to Redmond. HCT alternatives were to be considered for the SR 520 and I-90 corridors at a programmatic level (FHWA and FTA 2000).

The following alternatives were under consideration at the time of publication of the Notice of Intent:

- No build
- Maintain SR 520 as four lanes, but improve access, operation, and safety
- Add one HOV lane in each direction
- Add one HOV lane and HCT in each direction
- Add one HOV lane and one general-purpose lane in each direction
- Add one HOV lane, HCT, and one general-purpose lane in each direction

Each Build Alternative was also to include transportation system management measures, transportation demand management (TDM) measures, bicycle and pedestrian facilities, and environmental and neighborhood mitigation and enhancement measures.

During 2000, WSDOT, Sound Transit, FTA, and FHWA carried forward the committees' SR 520 recommendations by initiating the EIS process to evaluate improvements in the SR 520 corridor, including replacement options for the Portage Bay and Evergreen Point Bridges. For the next 2 years, the team continued to work on the Trans-Lake Project and

develop alternatives while receiving ideas from the public (WSDOT 2006).

Formal public scoping was conducted from June 2000 to August 2000. During public scoping, public meetings and community briefings were held to provide information and gather input, community and city-sponsored newsletters were distributed, a project newsletter was mailed to over 3,600 recipients, and a project website and project hotline were set up. The following 19 alternatives plus the No Build Alternative were suggested in the course of public scoping:

- No Build
- Minimum Footprint
- HOV lanes
- General-purpose and HOV lanes
- General-purpose lanes
- Bus and vanpool only lanes
- HOV tunnel
- New freeway bridge between I-5, Sand Point, Kirkland, and I-405
- New 4-lane arterial bridge between Sand Point and Kirkland
- Close SR 520 interchanges between I-5 and I-405
- Modify HOV operations
- Lane conversions to HOV or transit
- HCT in SR 520 corridor
- HCT in I-90 corridor
- Mid-lake HCT connector between SR 520 and I-90
- New north lake HCT corridor between Sand Point/Kirkland
- New north lake HCT corridor between Madison and Kirkland
- Increase effectiveness/investment in TDM
- Passenger ferry
- Arterial connections

The Trans-Lake Project team studied all of the alternatives identified during scoping through a first-level and a two-part second-level screening process. First- and second-level screening analyses are summarized in Exhibit 2.

Exhibit 2. Summary of Screening Analysis

Screening Phase	Alternative
Solution Categories or Themes	Highway solutions Transit solutions Transportation demand management solutions Other solutions (for example, ferries or arterial streets)
Alternatives passed to second-level screening	No Build Minimum Footprint HOV lanes General-purpose and HOV lanes Bus and vanpool lanes only HCT in SR 520 corridor (seven route options) HCT in I-90 corridor (two route options) Mid-lake HCT corridor (one route option)

The goal of the process was to select the most promising options for more detailed analysis in the EIS (Trans-Lake Washington Project 2000c). Each alternative was to be measured against criteria established by the Trans-Lake Project participants. Those criteria and their performance measures would be based on the purpose and need for the Trans-Lake Project. The proposed criteria were to be reviewed by the Technical Steering Committee, the Advisory Committee, and the public, and then recommendations would be made to the Executive Committee, which would select the final criteria.

On October 25, 2000, the Executive Committee formally adopted the alternatives analysis first- and second-level screening process.

Signatory Agency Committee Concurrence Point 1

WSDOT relied upon the Signatory Agency Committee (SAC) to systemize and streamline environmental compliance for the Trans-Lake Project (SR 520 Project 2006a). The following federal and state agencies were signatories to the 1996 NEPA/404 Merger Agreement:

- Federal Agencies
  - U.S. Army Corps of Engineers
  - National Oceanic and Atmospheric Administration (NOAA) Fisheries (formerly National Marine Fisheries Service)
  - U.S. Environmental Protection Agency (EPA)

  - FHWA
  - U.S. Fish and Wildlife Services
- State Agencies
  - Washington State Department of Ecology (Ecology)
  - Washington Department of Fish and Wildlife
  - WSDOT

The goals of the agreement were as follows:

- Create a clear, consistent and efficient environmental analysis and permitting process that occurs within a predictable timeline.
- Provide a forum to exchange information
- Ensure committed participation by agencies
- Complete EISs that adequately consider the environment
- Result in the delivery of transportation projects

The agreement applied to all transportation construction projects in Washington requiring an individual U.S. Army Corps of Engineers permit, FHWA action on an EIS under NEPA, or WSDOT action under the State Environmental Policy Act (SEPA). Approvals that are covered by the process include Section 401 (wetlands) and 404 (dredge and fill) permits under the Clean Water Act, Section 7 consultation under the Endangered Species Act, state Hydraulic Project Approvals, and shoreline permits.

SAC agencies were to seek to reach agreement at three "concurrence points" on the Trans-Lake Project:

1. Purpose and need statement and screening criteria for alternatives selection
2. Range of Trans-Lake Project alternatives to be evaluated in a Draft EIS
3. Selection of a preferred alternative (differs for federal and state agencies):
   - NEPA/SEPA preferred alternative/apparent Section 404 least environmentally damaging practicable alternative and detailed mitigation plan (U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, EPA, and NOAA Fisheries)

  - NEPA/SEPA preferred alternative and detailed mitigation plan (Ecology and Washington Department of Fish and Wildlife)

An issue/dispute resolution process existed and was entered into if concurrence with any of the above points could not be reached. The SAC reached the first concurrence point for the Trans-Lake Project in February/March of 2001. All agencies involved concurred with the following:

- The Trans-Lake Project purpose and need
- The criteria for alternative selection (Trans-Lake Washington Project 2000a)
- The role of all agencies

First Screening Analysis (2000)

The goal of the first screening analysis was to eliminate alternatives that did not meet the purpose statement for the Trans-Lake Project and those that did not score as high as alternatives recommended by the Trans-Lake Study Committee. WSDOT asked the following three questions for each alternative during this screening:

- **Will the alternative be effective in improving mobility for people and goods?** The criteria used to answer this question were: 1) how much the alternative improved mobility, 2) whether the alternative increased or decreased reliability and safety, and 3) whether the alternative was compatible with other existing transportation system plans.
- **Can we reasonably avoid, minimize, or mitigate its environmental effects?** To answer this question, the team assessed the Trans-Lake Project's effects on wetlands, habitat for threatened and endangered species, federally protected parks and historic properties, residential and commercial properties, and neighborhoods.
- **How much will it cost?** The Trans-Lake Project team developed a cost estimate for each major concept.

The first screening analysis examined the 19 alternatives identified during the scoping process. These alternatives were categorized into four different solution categories or themes. Each alternative was then evaluated against the other alternatives within its theme according to the basic transportation, environmental, and cost criteria described

above. Eight alternatives were passed on to second-level screening (see Exhibit 2).

Second-Level Screening Analysis (2001)

The Trans-Lake Project team next used the second-level screening process to determine which multimodal alternatives would be considered in the EIS. The second-level screening analysis consisted of several steps. First, the team conducted a modal analysis that separately compared highway and HCT alternatives within their mode of operation.

The second-level screening analysis considered more factors at a more detailed level of analysis than the first-level screening. The three main criteria for screening the modal and multimodal components of the Trans-Lake Project were effectiveness, environmental effects, and cost, just as in the first-level screening. However, to determine the effectiveness of the alternatives, the Trans-Lake Project team also considered other factors. Exhibit 3 summarizes the second-level screening process.

Combined Modal Analysis and Second-Level Screening of Multimodal Alternatives

Next, the best modal alternatives were combined to create seven multimodal alternatives, each with highway and HCT components:

- SR 520 safety and preservation, I-90 light-rail transit
- SR 520 HOV, I-90 light-rail transit
- SR 520 HOV, general-purpose lanes, I-90 light-rail transit
- SR 520 HOV, SR 520 HCT
- SR 520 HOV, general-purpose lanes, SR 520 HCT
- SR 520 HOV with bus rapid transit (BRT) connections
- SR 520 HOV with BRT, general-purpose lanes

BRT connections with HOV lanes included bus service that would have also used the HOV lane for stops. Non-BRT traffic could not have gone through the BRT connection area. HOV lanes might have otherwise accommodated only HOV traffic. However, options with HOV lanes might have included accommodating not only BRT, but also light-rail transit or another HCT system.

Second-level environmental screening criteria were then applied to these multimodal alternatives developed through the combined

Exhibit 3. Summary of the Second-Level Screening Process

Factors Considered	Mobility Reliability and safety System compatibility
Considerations for Determining Environmental Effects	Displacement/disruption Neighborhood, Section 4(f) and Section 106 resources Noise and vibration Visual quality Land use Fish-bearing streams/threatened and endangered species Critical upland habitat/threatened and endangered species Wetlands, shorelines, and habitat connectivity Water resources (quantity and quality) Air quality
Factors Considered for Evaluation Cost	Capital costs Operations and maintenance costs Life-cycle costs
Highway Alternatives Passed through First Step of Second-level Screening	No Build HOV lanes General-purpose and HOV lanes
HCT Modal Alternatives Passed through First Step of the Second-level Screening	No Build HCT in SR 520 corridor HCT in I-90 corridor

Source: Trans-Lake Washington Project (2001a)

analysis, and the various alternatives were rated for comparison (Trans-Lake Washington Project 2001b).

At that time, the following were also recommended for additional analysis:

- I-90 light-rail transit parallel bridge
- 8-lane Alternative
- Interchange alternatives

In addition to the two-step second-level screening process for the alternatives described above, a study was completed to evaluate how future HCT could be accommodated within the SR 520 corridor (WSDOT and Sound Transit 2002).

Trans-Lake Washington Project Community Design Workshops

From November 2000 through January 2001, the Trans-Lake Project team met with a group made up of both agency and community representatives in design charrettes (final, intensive efforts to finish discussions of the Trans-Lake Project design recommendations before the alternatives analysis was too far along in the process). The charrettes included ten 1- to 2-day sessions to discuss the following topics:

- Construction staging
- HCT
- Westside interchanges (I-5 and Montlake)
- East connections, including I-405
- Minimum footprint
- Point communities

A final 5-day session was a combined value analysis including a review of HCT in the corridor. The following key issues were raised at the sessions:

- Keeping SR 520 open to traffic during construction would be very difficult and expensive.
- Avoiding deviations to design standards would be costly and, in some cases, problematic.
- An added access report for FHWA consideration would be necessary and difficult to attain in some case because of the effects to I-5 and I-405.
- Tunneling at I-5, Montlake Cut, and through the Points communities (Medina, Hunts Point, Clyde Hill, and Yarrow Point) would be very expensive and have less desirable geometric roadway sections than surface roadways.
- Environmental effects would be severe with several of the proposed alternative designs.
- The interchange at I-405 would be very complex and require considerable additional work to arrive at a reasonable solution.

- Flyer stops should be included in all alternatives regardless of the HCT/HOV considerations because of the uncertainty of future timing for HCT improvements.
- Staging of improvements would be critical to ensure a logical progression of projects.
- Mitigation and enhancements in the affected communities would be critical to gaining support from local communities.
- It would be difficult to estimate future costs with precision at that stage of the Trans-Lake Project.
- The Trans-Lake Project should include all movements necessary for a complete facility, in particular the HOV and BRT movements.
- Seismic considerations would require replacing several structures previously thought to be sound.
- HCT, if included on SR 520, should be in the center of the floating bridge to eliminate torsional movements during storms.

The workshops were part of the ongoing process to include community values and ideas in the alternatives screened and evaluated. The results of these workshops were reflected in the conceptual plans at that time. Not all suggestions that resulted from the sessions were incorporated into the drawings, as some ideas proved infeasible, impractical, or unpopular in the public eye.

In May 2002, a preliminary report was developed (WSDOT 2002a) summarizing three lidding concepts and potential effects for each of four study areas:

- Eastlake/Portage Bay/Roanoke/North Capitol Hill neighborhoods
- Montlake neighborhoods
- Lake Washington to west of I-405
- East of I-405 to SR 202

Initial Alternatives Analysis (2001–2002)

Lake Crossing Concepts

In 2001, the Trans-Lake Project team conducted a study to assess the available technical options for structural crossings of Lake Washington. All of the facility characteristics had not yet been defined at that time; however, two, three, or four traffic lanes in each direction as well as

pedestrian and bicycle access were anticipated. HCT was also considered a possibility, either combined with the roadway or located in a separate corridor.

The structural options analyzed in the report included the following (Trans-Lake Washington Project 2001c):

- Bored tunnels below the lake bottom
- Sunken tunnels placed on the lake bottom
- Floating tunnels suspended below the lake surface
- Floating bridges on the lake surface
- Fixed bridges above the lake surface

Comparable facilities in other parts of the country and the world were used to assess the technical feasibility and order of magnitude costs of the various options.

A general review of the lake crossing options showed:

- For all of the roadway tunnel options, pedestrians and bicycles could not have used the corridor unless a separate tunnel compartment were constructed.
- Ventilation of the tunnels would have required a major ventilation structure near each shore and additional ones for the approach tunnels.
- Because of the high cost of tunnel construction, it would be unusual to provide full shoulders in long tunnels. Instead emergency response vehicles would be kept on-call.

The analysis resulted in the following conclusions:

- **Bored Tunnels.** Bored tunnels were the highest cost alternative. Even though the tunnel would not have been visible, several ventilation structures would have been. Because a highway tunnel in the SR 520 corridor would have surfaced at I-5 and I-405, it would not have served the traffic in the Montlake area and in the Eastside communities west of I-405. Pursuing that option further would have required performance of a thorough preliminary geotechnical evaluation and tunnel design. It was not recommended that WSDOT pursue the bored tunnel option further.
- **Sunken Tunnels.** Sunken tunnels were the second highest cost alternative. The approach tunnels would have needed to go much

deeper than floating tunnels and would, therefore, have been longer and more costly. The transition from water to ground at a depth of 200 feet might also have proven to be unmanageable and too costly upon further study. The soft lakebed material would have provided a questionable foundation that might have resulted in differential settlements of the tunnel structure. It was not recommended that WSDOT pursue the sunken tunnel option further.

- **Floating Tunnels.** Floating tunnels were the third highest cost solution. While the technologies required had been used in sunken tunnels and floating bridges, no similar facilities existed anywhere at that time. An inherent risk existed in using a new technology. Because a floating tunnel would have been located relatively high, the approach tunnels would have almost certainly been constructed using the cut-and-cover method, with its associated substantial effects to the shoreline. Additional operational risks would have existed because a breach of the shell could have led to a catastrophic failure of the tunnel. It was not recommended that WSDOT pursue the floating tunnel option.
- **Floating Bridge.** A floating bridge was the lowest cost option. That type of structure had a proven record, though difficulties had arisen in the original Lake Washington crossings. Except for the highrise, the structure would have been relatively unobtrusive and would have served trucks and non-motorized traffic. The floating bridge was considered the most likely candidate for a new lake crossing.
- **Fixed Bridge.** A fixed bridge would have cost more than a floating bridge because of the deep foundations and/or long spans required. Suspension and cable-stayed bridges would have had tall towers and been a dominating feature. To get better data on foundation conditions before any of the fixed bridge solutions could be adopted would have required the performance of geotechnical investigations and a foundation study.
  - **Suspension Bridge.** A suspension bridge would have spanned the sediment area of the lake and the main piers would have their foundation directly in the dense material. It would have had a significant nearshore effect because the large cable anchors would have been located there. That effect made it the least desirable of the fixed bridges and was not recommended for further study.

- **Cable-Stayed and Segmental Box-Girder Bridges.** Cable-stayed and box-girder bridges would have foundations in the deepest part of the lake. They could have been considered an alternative to the floating bridge, with intensive foundation studies as part of the next Trans-Lake Project phase.

Transportation Demand Management Evaluation

The following TDM strategies were evaluated as part of the evaluation of multimodal alternatives (Trans-Lake Washington Project 2002a):

- **Vanpooling.** Vanpooling has been a successful TDM strategy in the region since 1979. It is particularly effective in reducing trips between lower density urban or suburban areas with lower levels of transit service.
- **Employer-Based Trip Reduction**. Commute trips make up the single highest category of Trans-Lake travel, and offer the greatest potential for corridor trip reduction. A successful employer-based TDM program could be expected to reduce overall single-occupant vehicle use by up to 10 to 12 percent. Jurisdictions and businesses could develop a wide range of strategies, including transportation management associations; alternative work schedules; parking management; carpool, vanpool, and transit subsidies; and guaranteed ride home programs.
- **Public Information and Promotion**. This strategy would provide outreach and services to improve people's awareness of their trip-making options. It would improve access to high-quality information about ridesharing, carpooling, vanpools, transit, and other modes within the corridor. It would also encourage measures to promote and deliver information about the corridor's transportation services in a seamless way.
- **TDM-Supportive Land Use**. This strategy would support regional and local actions to target future growth to urban centers, suburban clusters, key arterials, and transit stations/centers. The strategy encourages continued development of higher-density areas that typically include a mix of office, retail, commercial, and residential development within business districts and activity centers—all within walking distance of transit services. Some of the potential activities under this strategy involve transit-oriented developments; incentives for individuals and businesses to develop in or locate in transportation-efficient areas; funding support for local bicycle,

sidewalk, and other connectivity improvements; and parking supply management programs.

- **Public/Private Initiatives**. This strategy would promote trip-reduction partnerships between corridor jurisdictions, businesses, and organizations using a combination of technical support, incentives and shared promotion. Although the non-commute trips targeted by this strategic group make up a substantial share of the demand for travel on SR 520, the market actually consists of a great variety of other trips by purpose, destination, and time. Thus, this category provides a high opportunity for innovation.
- **Pricing**. This strategic group would employ cost factors to encourage travelers to consider true travel costs in trip-making decisions. The strategy would seek to reduce the demand for general-purpose trips and increase the attractiveness of transit and HOV modes. It could also reduce the potential for "latent demand," which is the tendency for new trips to be created if more capacity in the corridor becomes available. According to some estimates, vehicle travel could be affected by 10 percent or more on a corridor basis, although some prime commuter corridors have had smaller reductions when tolls were implemented. This strategy had the greatest potential effect of all of the strategies that were considered.

The potential TDM actions were evaluated on their ability to be applied to a corridor program that could be implemented in conjunction with transit and highway improvements. The analysis considered how many corridor users would be targeted by a TDM action, where they were located in the Trans-Lake Project area, and what data were available on the effects of the TDM action, especially if it had been previously applied in a similar corridor. The key findings were as follows:

- An overall TDM program could substantially enhance the other mobility actions in the corridor. Without TDM, it would be difficult to achieve the long-range forecasts for transit and HOV use that would represent a major change in travel behavior in the region. However, TDM should not be expected to fully compensate for a basic lack of available capacity and poor mobility across the lake.
- A strong regional TDM program would have similar benefits to the corridor and operate similarly to a corridor program, although a corridor program appeared to offer more certainty of implementation along with SR 520 improvements.

- Both I-90 and SR 520 had a much higher rate of work trips than other facilities in the region, confirming that commute trip-based strategies would focus on the largest single travel market and yield the most benefits to the corridor.
- Seven areas made up the majority of trips and were the best targets for investment: downtown Seattle, Kirkland/Totem Lake, Redmond/Overlake, downtown Bellevue/northwest Bellevue, northwest Seattle, the University District, and east central Seattle.
- Most of the strategies were based on incentives, information, and promotion, as suggested by corridor participants. To be even more aggressive, the program could consider disincentives to drive-alone trips such as imposing tolls or corridor pricing or increasing parking costs throughout the corridor. An expansion of employer-based trip reduction programs could also be mandatory for employers, rather than voluntary, to improve effectiveness.
- Transit service in the corridor would need to keep pace or exceed population and employment growth. The high forecast levels of transit use would not occur overnight, and steadily higher levels of service would be needed to foster growth. Aside from improved frequencies and route coverage, transit quality could also be improved by transportation system management measures such as arterial HOV and transit priority systems, and by improved rider information systems.
- Regional TDM programs and services would need to be implemented in conjunction with a corridor TDM program.

The following recommendations resulted from the TDM study:

- Expand commute trip reduction programs.
  - Employer-based commute trip reduction
  - Transportation management associations
  - Vanpooling
- Develop public information, education, and promotion programs
- Encourage TDM supportive land use
- Encourage public/private initiatives
- Explore pricing and parking costs as an option

Other key findings and recommendations were as follows:

- Travel demand would be greatly affected by land use and transportation actions that are not included in the TDM program. These other factors should be considered throughout the development and implementation of the Trans-Lake Project and its TDM element.
- TDM performance data specific to the corridor were limited, although regional programs had established strong track records at specific work sites.
- The TDM effectiveness estimates should be seen as general guides to the potential benefits of TDM for the corridor.
- Transportation pricing, tolls, or user fees appeared to have promise, but more study was needed.
- Continued regional progress on implementing and expanding TDM programs was also needed.
- The benefits of TDM investments might have been better measured by improved mobility and increased person throughput, rather than by measures of congestion or vehicle volumes.

The recommended next steps included initiating an adaptable management plan for TDM and developing an initial corridor management plan or agreement.

Alternatives Recommended by the Executive Committee

At their meeting in January 2002, the Executive Committee discussed the following issues (Trans-Lake Washington Project 2002b):

- Whether fixed guideway HCT should be on SR 520 or I-90
- If the No Build, 4-lane, 6-lane, and 8-Lane Alternatives should be carried forward
- Community enhancements (lids)

As a result of the discussions held at the meeting and public input received, the Executive Committee reached the following recommendations for the EIS:

- Continue analyzing the 4-Lane Alternative, built to current standards
- Examine the 6-Lane Alternative with combined HOV/BRT lane (with and without an additional Montlake Cut crossing)

- Carry forward the 8-Lane Alternative, consisting of three general-purpose lanes and one HOV/BRT lane with 4-foot buffer
- Support the current Sound Transit Phase II vision, which places fixed guideway HCT in the I-90 corridor first
- Accommodate long-term future exclusive right-of-way for HCT on SR 520, taking into account maximum design flexibility for HCT technologies
- Evaluate significant investment in TDM

The next steps were to further refine lane alternatives and fill in design concepts with details on interchanges, local traffic, lid configurations, and noise mitigation. Work was to continue to refine EIS methodologies. At the meeting, it was anticipated that interchanges, lids, TDM, and local street improvements would be defined around June 2002.

Interchange Design Analysis

Eight independent meetings were held in 2002 to discuss the remaining interchange design options along the SR 520 corridor (Trans-Lake Washington Project 2002c). The purpose of these meetings was to reach consensus on the interchange design options to be carried forward into the Draft EIS, considering that many alternatives and variations were evaluated during preliminary design. The preliminary design evaluated around 15 to 20 interchange options and modeled over 50 ramps.

The meetings also provided an opportunity to identify remaining issues that had not been included or addressed in the past, while acknowledging that changes would occur before a preliminary preferred alternative was selected. The meetings covered the following five different areas along the SR 520 corridor:

1. I-5
2. Montlake
3. 84th Avenue NE, 92nd Avenue NE, 148th Avenue NE, NE 40th Street, and NE 51st Street
4. I-405, Bellevue Way NE, and 124th Avenue NE
5. West Lake Sammamish Parkway/SR 202

The interchange selection was a four-step process

First Step

The first step was to create a methodology and agreement on the selection and rating process. A matrix was developed to summarize goals and effects for each interchange concept. The Trans-Lake Project team agreed on the following elements to be evaluated and rated in the selection process:

- Highway operations
- Highway design quality
- Local street operations
- Local street design quality
- Transit
- Nonmotorized
- Construction staging
- Natural environment
- Built environment
- Construction cost
- Operations and maintenance cost
- Right-of-way cost

Second Step

The second step was team meetings to review all interchanges documented in the conceptual plans package. One meeting was held to discuss interchanges on the west and east sides of the lake. Team members included Trans-Lake Project task leaders and specialists, WSDOT managers, Sound Transit representatives, and local agency representatives. The meeting was used to screen out interchanges that did not merit further study. Interchange concepts removed either had fatal design flaws or did not meet the goals of the Trans-Lake Project.

Third Step

The third step was to analyze and rate the remaining interchange concepts. Environmental, traffic, cost, and engineering members of the team rated each interchange concept according to the criteria developed in the first step. Ratings were based on data and information gathered during the multimodal analysis. Some additional traffic modeling was performed to assess operations.

Fourth Step

The fourth step consisted of team meetings to discuss the matrix ratings for the interchanges, and to obtain concurrence from WSDOT, Sound Transit, Metro, and local agencies on the ratings. Each interchange concept was discussed in detail, including all elements included in the matrix. All participants then discussed the ratings developed by the team until consensus was reached. At the conclusion, all ratings were compared to determine the leading interchange candidates.

Decisions Made at Each Final Interchange Screening Meeting

The following paragraphs summarize the decisions that were made at each final interchange screening meeting.

I-5

The option selected for the safety and preservation alternative would add a westbound-to-southbound reversible HOV connection at I-5. The option preferred for both the 6- and 8-lane Alternatives would improve access to I-5 south by changing the westbound-to-southbound fly-over and the southbound-to-eastbound tunnel from left connections to right connections to I-5, adding north and south reversible HOV connections, and adding a southbound auxiliary lane from SR 520 to Stewart Street. The 8-Lane Alternative would include moving the Mercer-to-northbound on-ramp to a right hand on-connection. The 6-Lane Alternative would require additional evaluation to determine whether the ramp would have been included in the interchange. Local service ramps would be maintained where possible.

Montlake

One option to the 6-Lane Alternative retained for further consideration would rebuild the existing features to match the widening of SR 520 to the University District, and consolidate the existing ramps at the Arboretum. Another retained 6-Lane Alternative option would rebuild the existing features to match the widening of SR 520 to the University District, consolidate the existing ramps at the Arboretum, add HOV braided ramps from center HOV lanes to outside ramps at Montlake, widen the Montlake Bascule bridge to 6 lanes, and creating arterial HOV lanes on Montlake Boulevard—leaving the preferred Montlake bascule bridge widening option to be determined by stakeholders at a later date.

An 8-Lane Alternative option retained for further consideration would include constructing a cut-and-cover tunnel to provide a new crossing of the Montlake Cut, incorporate Lake Washington Boulevard ramps with the tunnel ramps (the Arboretum traffic would be prohibited from entering the tunnel), and provide HOV direct connections to the tunnel. The preferred layout of the grade-separated intersection at Pacific and Montlake was still to be determined.

One other conclusion related to Montlake was that the favored interchange for the 4-Lane Alternative at I-5 would require an inside flyer stop at Montlake if an HOV reversible ramp at I-5 were incorporated.

84th Avenue NE, 92nd Avenue NE, and 148th Avenue NE

No changes other than safety improvements were chosen for the preferred design option. Discussions subsequent to the final screening session determined that median flyer stops would be provided at Evergreen Point Road and 92nd Avenue NE.

NE 40th Street and NE 51st Street

The preferred option for the 8-Lane Alternative would replace the existing collector-distributor (C/D) lane weave with grade separations (braided ramps), the eastbound on-ramp from NE 40th Street would be over the eastbound off-ramp to NE 51st Street, and the westbound off-ramp to NE 40th would be under the westbound on-ramp from NE 51st Street.

Other conclusions for NE 40th and NE 51st streets were that, because of width restrictions at the existing NE 40th Street bridge, the proposed 6-Lane Alternative would add a direct access T-ramp at NE 31st Street (providing access to and from the east) in place of a median flyer stop at NE 40th Street. Also, the 8-Lane Alternative would require lowering the eastbound mainline profile by 2 to 3 feet to maintain vertical clearance under the existing NE 40th Street bridge.

I-405, Bellevue Way NE and 124th Avenue NE

For 124th Avenue NE, it was concluded that ramps to/from the east would be eliminated at 124th Avenue NE. Access from 124th Avenue NE to I-405 was very important (more

Intersections

Traffic analysis showed that design modifications would have been required for the 2030 No Build Alternative and/or one of the 2030 Build Alternatives for the following intersections:

Denny Way/Stewart St.
John St/Eastlake Ave.
Mercer St/Fairview Ave./I-5 Ramps
Valley St/Fairview Ave. N
Roanoke St/10th Ave. E
Harvard Ave/Roanoke St/SR 520 WB Off-Ramp
Lake Washington Blvd/SR 520 EB On/WB Off-Ramps
Montlake Blvd. NE/SR 520 EB Ramp
Montlake Blvd. NE/SR 520 WB Ramp
Montlake Blvd. NE/E Shelby St.
Montlake Blvd. NE/NE Pacific St.
Montlake Blvd. NE/NE Pacific Pl
Montlake Blvd. NE/25th Ave. NE
Montlake Blvd. NE/25th Ave. NE
Montlake Blvd/Walla Walla Rd/NE 44th St.
Montlake Blvd/NE 45th St.
25th Ave. NE/Pend Oreille Rd./NE 44th St. NE Pacific St./NE Pacific Pl. NE Pacific St./ 15th Ave. NE
84th Avenue NE/Hunts Point Circle
92nd Avenue NE/SR 520 WB Off-Ramp
Bellevue Way/NE Points Drive
Bellevue Way/SR520 WB On/EB Off-Ramps
10 108th Avenue NE/Northup Way
8th Ave. NE/SR 520 EB On-Ramp
124th Ave. NE/Northup Way
148th Ave. NE/NE 24th St
148th Ave. NE/SR 520 EB Ramps
148th Ave. NE/SR 520 WB Ramps/NE 29th St.
NE 40th Street/SR 520 WB Ramps
NE 40th Street/SR 520 EB Ramps
NE 40th Street/156th Avenue NE
NE 51st Street/SR 520 WB Ramps
NE 51st Street/SR 520 EB Ramps
SR 520 EB Ramps/ W Lake Sammamish Pkwy.
SR 520 WB Ramps/ W Lake Sammamish Pkwy/Leary Way NE
159th PL. NE/NE Leary Way
Bear Ck. Pkwy/NE Leary Way
Bear Ck. Pkwy/NE 74th St.
Redmond Way/SR 520 WB On-Ramp
Redmond Way/SR 520 EB Off-Ramp
NE 76th St/SR 520 WB Off-Ramp
Redmond Way/NE 70th St.
E Lake Sammamish/180th Ave /Redmond Way
NE Union Hill Rd./Avondale Rd. Extension
Avondale 520 Extension/Avondale Rd. NE

important than access to the east on SR 520). New diamond ramps to/from the south on I-405 would be added at Northup Way to serve the demand from 124th Avenue NE to I-405. The Northup Way interchange would be modified to a full-diamond configuration. Northup Way would be realigned and lowered to accommodate a new off-ramp from northbound I-405 and a 116th Avenue NE connection.

One option at Bellevue Way retained for further consideration included an offset diamond interchange at Bellevue Way NE. Westbound access would be on the north side of the interchange, eastbound access would be on the south side of the interchange, and there would be an HOV/transit direct access ramp to/from the west at 108th Avenue NE.

The option of maintaining the existing interchange configuration was modified for further consideration to include Bellevue/Seattle and Kirkland/Seattle HOV system connections and Northup Way ramps.

West Lake Sammamish Parkway/SR 202

At SR 202/Redmond Way, the preferred option for both the 6- and 8-Lane Alternatives would include a second bridge over Redmond Way for westbound traffic; a semi-directional ramp from westbound SR 202 to westbound SR 520; an HOV direct access ramp to the Bear Creek Park and Ride; and an HOV termination that would be grade separated at NE Union Hill Road and would have included transition to the outside for future arterial HOV lanes on Avondale Road NE.

Local Traffic Effects

In 2002, the Trans-Lake Project team analyzed local traffic effects for both the Westside and Eastside of the Trans-Lake Project corridor (Trans-Lake Washington Project 2002d). The Westside referred to the area of affected interchanges and selected intersections in the SR 520 corridor vicinity west of the Evergreen Point Floating Bridge, including some along the I-5 corridor. I-5 intersection analysis began with the Stewart Street interchange on I-5 and continued north to the Harvard/Roanoke interchange at the SR 520 connection. The Eastside segment covered the SR 520 corridor, including affected interchanges and selected intersections, from the Evergreen Point Floating Bridge east to the SR 520 terminus at the Avondale Interchange at Union Hill Road.

The analysis considered the effects of both the 6- and 8-Lane Alternatives. Intersections were analyzed to determine which would require additional design modifications to accommodate 2030 morning

and/or afternoon peak hour demand volumes with any of the Build Alternative design options. Design modifications were triggered by the threshold adopted specifically for the Trans-Lake Project traffic analysis:

- Intersection level of service (LOS) with either 6- or 8-Lane Alternative volumes should be no worse than the comparable 2030 No Action LOS
- Average intersection delay should increase by no more than 5 seconds

Twenty-six intersections were projected to operate at or below LOS E (near failing) with 2030 No Action volumes, including 8 Westside and 18 Eastside intersections.

With the 2030 6-Lane Alternative, 17 of the Westside intersections analyzed would have operated worse than with 2030 No Action volumes, triggering the need for additional design modifications. Another 18 Eastside analysis locations would have exceeded the 2030 No Action threshold.

With the design modifications assumed in the traffic analysis, 20 intersections were projected to operate at LOS E or LOS F (failing). A design option for the 2030 6-Lane Build alternative would have provided a new parallel Montlake bridge. This design option was analyzed at four intersections, and did not affect the number of design modifications needed. New traffic signals were not considered design modifications.

With the 2030 8-Lane volumes, 16 Westside and 25 Eastside intersections would have exceeded the 2030 No Action threshold and require additional design modifications. With potential design modifications reflected in the traffic analysis, 16 intersections were projected to operate at LOS E or LOS F with the 8-Lane Alternative (WSDOT 2002b).

Lid Options

The Trans-Lake Project team conceptualized and evaluated options for constructing expanded bridges or lids over portions of the SR 520 corridor (Trans-Lake Washington Project 2002e). A key objective of the project was considered to be making the highway a better neighbor with the community and a better fit with the environment. In order to meet that objective, a community design process was developed to

provide guidance and input toward the development and design of the potential alternatives.

The community design process revealed strong feelings at the neighborhood level related to problems that resulted from the initial construction of I-5 and SR 520 in the early 1960s. During that period, the highways were placed through communities severing historical connections between neighborhoods. Additionally, there was little regard for considering other effects on the community resulting from the highway and traffic, principally noise. In order to address those concerns, a variety of opportunities for constructing widened bridges and lids over the highway were explored.

It was determined that the construction of lids over sections of SR 520 and I-5 could create opportunities for a variety of end uses and benefits to the community, including:

- Allowing more connectivity and livable communities
- Developing potential public, commercial, residential, and recreational facilities on the lid
- Developing passive open spaces
- Reducing noise levels in the corridor when built in combination with sound walls

Lid concepts varying from 20 acres for unventilated lids to 77 acres with mechanical ventilation have community opportunities that generally are not considered on highway projects.

Seven locations were considered for constructing lids:

- Eastlake/Portage Bay/Roanoke/North Capitol Hill neighborhoods
- Montlake neighborhoods
- Evergreen Point Road area
- 84th Avenue NE area
- 92nd Avenue NE area
- From Lake Washington to Bellevue Way NE
- East of I-405 to SR 202

Three basic design concepts were explored for these locations. Each is described in the following text.

Design Concept 1—Expanded Bridges

This design concept would include using widened bridges where existing overcrossings over SR 520 and I-5 are present. It would widen the bridges to either 100 feet or 300 feet. This would provide approximately 30 feet beyond the traffic lanes on each side for the 100-foot-wide option and about 120 feet for the 300-foot-wide option. The additional widening would serve several functions as follows:

- It could provide space for widening existing sidewalks to provide additional capacity for pedestrians, or for shared pedestrian and bike trails.
- It could provide landscape buffers between traffic lanes and pedestrian or bike facilities to enhance the comfort and safety of pedestrians.
- It could provide a landscaped buffer at the edge of the bridge. Such buffers would enhance the continuity of the street by blocking or screening the visual intrusion of the highway being crossed. Drivers, pedestrians, and bicyclists would have the sense of enclosure by landscape elements on both sides of the corridor. The visual experience would continue a landscape similar to the surrounding neighborhood over the highway.

It was determined that expanded bridges would have little effect on noise levels. Noise barriers between roadways and affected receivers were expected to be constructed over most of the corridor under that option.

The costs associated with installing expanded bridges at the seven considered locations would range from $130 million to $190 million per bridge, depending on the width of the bridge.

Design Concept 2—Lids Sized and Configured to Fit Topography

This design concept would include placing lids in areas where road cuts put the travel lanes sufficiently below the surface on either side to allow clearance to vehicles while approximating the topography on either side. It would provide opportunities similar to those discussed for expanded bridges, including:

- Widening sidewalks would provide additional capacity for pedestrians and bicyclists
- Landscape buffers would be between traffic lanes and pedestrian or bike facilities

- The continuity of the street would be enhanced by providing a continuous corridor

In addition, lids could have provided the following:

- Opportunities for additional non-motorized connections other than at existing street overcrossings
- Opportunities to link existing public open spaces previously separated by the highway
- Opportunities to develop extensive landscape areas and active and passive recreation facilities

The lids would also provide opportunities to reduce highway noise levels, although in most cases the reductions achieved would be similar to reductions produced by sound walls. In cases where ramps to and from the highway were present, or where local arterials carried significant traffic, those features could have replaced the highway mainline as the major local source of noise.

The costs associated with the concept would range from $670 million per lid for lids of 400 to 600 feet in length and up to $1.9 billion for lids extending between 800 and 2,400 feet in length.

Design Concept 3 – Expanded Lids, Community Suggestions

Local communities suggested expanding lids beyond the opportunities provided by existing topography. The design of such lids commonly would involve either:

- Lowering the existing roadway to provide a cut section, creating a level lid at the elevation of the adjacent neighborhood. This could be accomplished only where topography on either side of the highway was at approximately equal elevation.
- Building a box to enclose the highway and either tolerating vertical walls on either side or, where sufficient space was available, covering the sides of the box by backfilling. This could occur on both sides in a flat area and on the downhill side where a highway was built into a side slope.

The result would have placed the highway in an aboveground tunnel with varying amounts of change in grade in the vicinity. Such a design would have many of the advantages of a lid, which takes advantage of topography, but may have adverse effects on adjacent residences when sides of the box were exposed. The most extensive lid concept

evaluated would have extended from the Evergreen Point Bridge eastward to near Bellevue Way.

The opportunities associated with the expanded lids were similar to the shorter options, but over a more extensive area.

The costs associated with this option would be approximately $3 billion, of which $2.2 billion would be for the Lake Washington to Bellevue Way lid.

Initiation of Signatory Agency Committee Concurrence Point 2

In September 2002, the former 1996 NEPA/404 Merger Agreement was revised as the "Signatory Agency Committee Agreement to Integrate Aquatic Resources Permit Requirements into the National Environmental Policy Act and the State Environmental Policy Act Processes in the State of Washington" (WSDOT 2002c). The revised agreement noted that the intent of the concurrence points in the process is to preclude routine revisiting of decisions that were agreed to early in the process and encourage early substantive participation by the regulatory/resource agencies.

In October 2002, the SAC concurred that the following four alternatives should be carried forward for further consideration and evaluation in the Draft EIS (Trans-Lake Washington Project 2002g):

1. No Build (four existing general-purpose lanes)
2. Four lanes (four general-purpose lanes reconstructed to current design standards)
3. Six lanes (four general-purpose lanes, two combined HOV/BRT lanes)
4. Eight lanes (six general-purpose lanes, two combined HOV/BRT lanes)

2002 to 2005—Transition to SR 520 Bridge Replacement and HOV Project

In 2002, because of cuts in state funding, the Trans-Lake Project was temporarily put on hold (WSDOT 2006). However, the Legislature's 2003 transportation funding package reinstated project funds. As

2002–2005 Transition to SR 520 Bridge Replacement and HOV Project

The transition from a single, large project to two separate projects is described on pages 37 to 53. This includes further 8-Lane Alternative analysis, deferment of I-5 improvements, West End bridge design and stormwater treatment, A Madison Park bicycle/pedestrian connection, a bridge maintenance facility, reinitiation of Signatory Agency Committee concurrence Point 2, additional analysis, Signatory Agency Committee concurrence Point 2 revisited, and a summary of alternatives considered. The recommendation that three alternatives be included in the Draft EIS: the No Build, the 4-lane, and the 6-lane alternatives.

part of the funding package, the section of SR 520 from West Lake Sammamish Parkway to SE 202 was established as a separately funded project.

A new phase of the Trans-Lake Project began, including continued preparation of the Draft EIS. WSDOT's cost estimate validation process for the "nickel funding" package now referred to the project as the SR 520 Bridge Replacement and HOV Project (SR 520 Project). The SR 520 Project limits were reduced to generally include I-5 in Seattle to I-405 in Bellevue (WSDOT 2003). WSDOT was now leading the Draft EIS for the SR 520 Project, along with FHWA and Sound Transit as co-lead agencies. FTA was no longer a co-lead federal agency on the Project.

Along with the funding, the legislature asked WSDOT to evaluate the I-5 corridor to determine what modifications would be required on I-5 to alleviate congestion caused by an 8-Lane Alternative (WSDOT 2006, Appendix U).

From this point forward, tolling was assumed to be an integral part of the SR 520 Project, both in the traffic modeling efforts and as part of project funding (WSDOT 2006, Appendix U).

WSDOT considered many alternatives for the SR 520 Project Draft EIS. Of these, the 8-Lane Alternative was evaluated and several tunnel options were studied in more detail. Ultimately, they were not advanced for study in the Draft EIS. The following subsections provide information about the transition to the SR 520 Bridge Replacement and HOV Project (WSDOT 2006, Chapter 3):

- Further 8-Lane Alternative analysis
- Deferment of I-5 improvements
- West end bridge design and stormwater treatment
- Madison Park bicycle/pedestrian connection
- Bridge maintenance facility
- Reinitiation of Signatory Agency Committee Concurrence Point 2
- Additional analysis
- Signatory Agency Committee Concurrence Point 2 Revisited
- Summary of alternatives considered

Further 8-Lane Alternative Analysis

A multi-step process was undertaken to accomplish the legislature's direction to further analyze the 8-Lane Alternative (SR 520 Project 2004a).

First Step

The first-step was to understand how the SR 520 Project 8-Lane Alternative traffic volumes might affect the operations of the I-5 corridor. The original 8-Lane Alternative, which did not include tolls, was compared with the No Build Alternative to see how the traffic volumes differed on I-5. After reviewing the results, WSDOT requested the team also evaluate the results of the 8-Lane Alternative with the SR 520 corridor tolled. Results from both models confirmed that adding capacity on the I-5 corridor between SR 520 and I-90 would serve additional trips generated from the 8-Lane Alternative.

Second Step

The purpose of Step 2 was to verify the findings of Step 1. This was done by evaluating the proposed I-5 revisions in the transportation planning model to determine how people might respond to new freeway capacity. As recommend by WSDOT, one new lane of capacity was added to I-5 in both directions, between the SR 520 and Corson Avenue/Michigan Street interchanges. The results showed that extending the capacity beyond the I-90 interchange would cause more vehicular trips to travel farther south on I-5.

Third Step

As part of the third step, a 1-day workshop was held to develop options to provide one new lane of capacity in both directions along the I-5 corridor between the SR 520 and I-90 interchanges. The corridor was divided into primary segments, and then segment options were combined in different ways to develop different corridor options. The three primary corridor options developed were the Frontage Road, Aerial Bypass, and Tunnel Bypass.

Fourth Step

The purpose of Step 4 was to determine which of the I-5 improvement options best met the purpose and need goals, which were characterized as improving traffic effectiveness while minimizing environmental effects and providing cost effectiveness. Screening criteria were developed using a selective combination of previously adopted first-

and second-level screening criteria used for the Trans-Lake Project. Because the I-5 corridor does not include similar natural resources, the analysis focused more heavily on the built environmental issues.

The result of the screening was a qualitative rating of each option relative to the others to help select an option that would potentially move forward into the Draft EIS. The Frontage Road option gained the highest rating because it would provide the most reliable improvements with the lowest anticipated cost and effects.

Fifth and Sixth Steps

Steps 5 and 6 included designing options to the same level as the rest of the SR 520 Project alternatives and having WSDOT, Sound Transit, and FHWA make the final decision as to whether the 8-Lane Alternative should be included in the Draft EIS. Ultimately, because of the effects identified in previous evaluations, the 8-Lane Alternative was not included for review in the Draft EIS.

The Trans-Lake Project team's planning-level evaluation for the 8-Lane Alternative indicated that the volume of traffic from eight lanes on SR 520 would have created additional backups on an already highly congested I-5 (Trans-Lake Washington Project 2002f). To alleviate these backups, the 8-Lane Alternative would have required that one additional lane be built in each direction on the I-5 corridor through downtown Seattle, from SR 520 to potentially as far south as the Corson/Michigan interchange (approximately 6 miles south of the I-5/ SR 520 interchange) (WSDOT 2006). The team shared this information with the various project committees during their meetings in late 2002.

Because the 8-Lane Alternative would cause severe congestion along I-5 and required additional study of how more capacity could be provided on I-5, the Executive Committee recommended dropping this alternative from further consideration in December 2002 (WSDOT 2006, Appendix U). The remaining alternatives were still to be carried forward for consideration in the Draft EIS.

Deferment of I-5 Improvements

WSDOT updated the Executive Committee on April 13, 2004, regarding the potential traffic effects on I-5 as a result of the 8-Lane Alternative and what might need to be done to mitigate those effects. WSDOT noted that the 4-Lane Alternative would send approximately 3,900 vehicles an hour from the general-purpose lanes of SR 520 westbound to I-5 during the peak hour operations in 2030. As a

comparison, the 6-Lane Alternative would send approximately 3,700 vehicles from the general-purpose lanes. The 8-Lane Alternative would send approximately 4,600 vehicles per hour. The difference between the 6- and 8-Lane alternatives was nearly 1,000 more vehicles an hour. WSDOT believed that accommodating those extra vehicles onto an already constrained and overcapacity roadway would be challenging (SR 520 Project 2004b).

To accommodate additional traffic coming onto I-5 from the 8-Lane Alternative, the project would have to extend SR 520 into downtown. The reason was that the latent demand on I-5 was so high that whatever improvements were made to I-5 would be quickly overburdened by the additional traffic diverted from parallel north/south routes to the freeway.

The SR 520 Project did not pursue this. Instead, it considered adding one lane in each direction on I-5 from SR 520 to I-90. To accommodate the additional lanes at the Convention Center, a tunnel would be required under the existing highway. This would also have had serious property effects east of I-5 around James and Madison streets. The challenges associated with this alternative would be constructing cut-and-cover tunnels, rebuilding pilings, coordinating with Sound Transit's proposed North Link route, and dealing with effects to I-5 mainline traffic. While such construction would have been possible, all such actions would have been very costly and highly disruptive to existing traffic.

The analysis showed that actions needed to accommodate the added traffic on I-5 were much bigger than the SR 520 Project. Continued analysis of The I-5 corridor was to be further analyzed in the then forthcoming I-5 planning study, which was to study the corridor between Northgate and Boeing Access Road. The findings on the traffic effects on I-5 of the 8-Lane Alternative were scheduled to be reported in the SR 520 Project Draft EIS. However, detailed study of the effects of widening I-5 to accommodate the additional SR 520 traffic were not to be included in the Draft EIS and, instead, would be dependent on the then forthcoming I-5 planning study.

West End Bridge Design and Stormwater Treatment

To prepare for an agency workshop to discuss stormwater treatment options for the western bridge approach, the SR 520 Project team

developed four vertical profile options. Any of the options could have been applied to the project, regardless of whether 4, 6, or 8lanes were ultimately chosen as the preferred alternative. The following four vertical profile options were developed:

- A profile with a Foster Island low point
- A profile with a low point at the peninsula
- A profile with a Foster Island high point
- A profile with an extended highrise

An initial screening process was conducted to select feasible stormwater management options to be presented at the agency workshop meeting. The screening included two items:

- Development of an issues and problem statement
- Development of a list of primary concerns in bridge design, stormwater treatment design and management, and protection of biological resources and water quality within the SR 520 Project limits

The issues and problem statement was then used as guidance to develop options that covered three separate bridge profiles, Ecology-approved and emerging technology best management practices, facility locations, and discharge locations (SR 520 Project 2003a).

In June 2003, the SR 520 Project team further refined the options. Specific design constraints and safety issues resulted in the following options begin removed early in the screening:

- Conveyance and treatment options that could have led to ponding of water on the roadway surface
- Conveyance and treatment options that would have required storing significant volumes of water
- Conveyance and treatment options that would have relied on collecting and pumping stormwater

The results of the screening process eliminated the following from further consideration:

- The profile with the low point at Foster Island because the profile would have necessitated construction of a treatment facility in an area valued for its biological resources

- Locating any stormwater treatment pond on Foster Island
- Potential use of an underground (and under-bridge) vault because of difficult maintenance requirements
- Stormwater (treated or untreated) discharging directly from the bridge deck onto the water surface because the public's perception was not favorable and only minimal dilution would occur

Based on the initial screening process, the following potential feasible stormwater conveyance, treatment, and discharge options were developed for the three remaining bridge profile options:

- A stormwater treatment wetland that would be located at the Museum of History and Industry site
- A stormwater treatment wetland that would be located on the peninsula
- Multiple stormwater treatment wetlands that would be located at the bridge piers
- Modified catch basins that would have high efficiency sweeping
- Various emerging technologies that would be located at the piers

In October 2003, a multi-agency workshop was held. The purpose of the workshop was to evaluate the profiles and treatment options and brainstorm the best means to avoid and minimize effects on the natural resources and humans.

Further evaluation by the SR 520 Project team, based on the preferences expressed by resource agencies at the workshop, resulted in selecting the Foster Island high point profile to carry forward. This profile would elevate the roadway over the Washington Arboretum's near shore and drop the roadway grade toward the shore and toward the offshore. The preferred stormwater treatment and discharge elements associated with the profile would be:

- High efficiency sweeping and modified catch basins along the entire bridge approach
- A Museum of History and Industry stormwater treatment wetland
- A small stormwater treatment wetland on the peninsula
- Bridge pier stormwater treatment wetlands

- Submerged discharge outfalls attached to the bridge support columns
- Conveyance of a portion of the bridge stormwater from the eastern section of the west end to the first floating bridge spill containment lagoon

Madison Park Bicycle/Pedestrian Connection

The City of Seattle, with WSDOT support, studied the potential for a bicycle/pedestrian connection between SR 520 and Madison Park. Community groups suggested this connection as a way to improve access between the Madison Park neighborhood and the University of Washington.

The following two routes were identified:

- The 37th Avenue East route would connect from SR 520 to a Seattle-owned site at the end of 37th Avenue East via a 750-foot-long pedestrian/bicycle bridge.
- The 43rd Avenue East route would connect from SR 520 to public right-of-way at the end of 43rd Avenue East via an approximately 1,000-foot-long pedestrian/bicycle bridge.

The SR 520 Project team evaluated the potential effects of these two options. The most notable effects related to ecosystems, visual changes, navigation, and benefits to pedestrian and bicycle transportation that would occur with either option included:

- The 37th Avenue East connection would be constructed over shallow open water and wetlands within a generally undeveloped area that provides habitat for a variety of wildlife uncommon in urban environments.
- The 43rd Avenue East connection would not affect wetlands, but would cross over open water at the edge of Union Bay in an area where young salmonids migrating from the southern end of Lake Washington are likely to pass.

The new bridge and supporting columns with either option would be highly visible to adjacent homes. Generally, the 43rd Avenue East connection would have greater effects because it would be longer, in a more visible location, and closer to more residences. The 37th Avenue East connection would not affect recreational or commercial vessel navigation because the section of Lake Washington that would be

spanned is limited to boats such as kayaks and canoes, which could easily pass under this bridge. The 43rd Avenue East connection, however, would restrict the sailboats with fixed masts that moor at the north Madison Park docks from passing under the bridge. Additionally, it would restrict the Seattle Fire Department Chief Seattle fireboat from passing under the bridge. Consequently, there would be an extended response time if it were necessary for another boat (the fast attack boat) to access this area.

Both of the options were consistent with the Seattle Department of Transportation's Bicycle Program and would provide recreational benefits. Either option would increase bicycle and pedestrian circulation and access to parks and neighborhoods. However, ultimately, this new neighborhood connection was not included in the alternatives.

Bridge Maintenance Facility

The existing SR 520 bridge has an 8-person, full-time maintenance crew dedicated to day-to-day routine maintenance, inspections, and bridge repairs. The crew works out of the Northup Maintenance Facility in Bellevue.

The need to rapidly implement damage control measures is crucial to minimizing the potential for loss of life and/or the possibility of a catastrophic failure of the bridge in the event of a major traffic incident, vessel collision, or earthquake. For this reason, the SR 520 Project team determined that a need existed to include a new co-located maintenance facility in the plans for the project (SR 520 Project 2004c). This location would serve as a full-time duty station and provide shop space for smaller repair work, storage for maintenance materials, and boat moorage for the two workboats dedicated to this bridge. Two workboats are currently tied up and accessed by maintenance crews at the draw span. The new bridge would not have a draw span, so the boats would have needed a new facility.

The SR 520 Project team considered the following locations for the new maintenance facility:

- **Medina Site Under SR 520.** A facility at this location would have been built into the approach structure abutment on the east shore of Lake Washington. The facility would have included a ramp/dock for boat moorage for bridge access.

- **Museum of History and Industry/Montlake.** A facility at this location would be located near the east end of the Montlake Cut on the south shoreline. The facility would likely be built in the open parklands directly adjacent to the shoreline.
- **Portage Bay at NOAA Facility.** A facility at this location would be built under/adjacent to SR 520 on the east shoreline of Portage Bay directly adjacent to the existing NOAA facility and the Portage Bay shoreline.
- **I-90 Shared Facility.** This facility would utilize the existing I-90 facility on Mercer Island as a shared facility.
- **Offsite Private Moorage (Kirkland).** This location would be one of very few commercial docks on Lake Washington. Kirkland was identified as the closest to SR 520.
- **On Pontoon Deck, Access from Freeway.** This would be a facility located on the pontoon deck under the elevated roadway. Access would be via an off-ramp type configuration from the mainline roadway down to the pontoon deck.

The following selection criteria were then applied to the various proposed locations:

- **Convenience to and from the Northup Facility for crews.** How easy was it to drive to the facility for larger repair work or for administrative matters during normal hours and during adverse traffic conditions? Would traffic or other factors make getting to the facility difficult, especially during emergency situations?
- **Convenience of the facility to the water.** How easy would it be for crews to access the bridge from the water?
- **Cost.** What was the comparative cost?
- **Environmental effect.** What would the environmental effect be? Would there be new effects? Could the effect be mitigated?
- **Accessibility to the bridge.** What was the comparative ease to reach the bridge from the operation facility?
- **Accessibility during a storm or other emergency.** How easy would it be to reach the bridge for emergency repairs during storms or other difficult circumstances?
- **Safe harbor.** How protected was the moorage for the boat?

- **Ability to perform duties.** Would the bridge operations crew be able to perform all necessary and routine duties?

After considering the various facility maintenance location options in light of the criteria, the SR 520 Project team recommended the Lake Washington east shoreline site in Medina for the following reasons:

- Convenience to the Northup Facility would be very good. Being able to easily access the larger shop and storage areas of the Northup Facility and not having to cross the bridge during storms or other emergency situations were considered major benefits.
- It would be close to the Evergreen Point Bridge for efficient crew work and timely emergency response.
- It would provide a good and accessible facility to moor the workboats.
- The facility would use SR 520 right-of-way.
- The facility would be well hidden in the bank and under the Evergreen Point Bridge.
- It would provide an exclusive facility for the Evergreen Point Bridge and a duty station for crew.
- The other potential lake site at Portage Bay adjacent to the NOAA facility would not allow the desired response time to the bridge. On a typical day, it could take between 45 and 60 minutes each way. With a greater volume of vessel traffic, the trip could take over an hour. The area from Portage Bay to the Montlake Cut and the Arboretum through to the channel markers on Lake Washington is classified as a "No Wake Zone." This classification limits the speed that vessels can travel to between 5 and 6 knots. It was further noted that there could be times during major wind storms when it would be unsafe to navigate the waters of Portage Bay, the Montlake Cut, and north Lake Washington.
- The use of commercial moorage sites or a shared I-90 facility were determined to be too far away, would result in an ever-increasing cost, and would result in insufficient and costly parking for the crew vehicles.

The new facility was proposed as a three-story structure built into the abutment under the new bridge (WSDOT 2006). Most of the facility would be buried in the bank slope. The maintenance crew would access

the facility using a driveway off Evergreen Point Road, just south of SR 520. The 10- to 20-foot-wide dock would be extended 70 feet into the water, where two slips would provide moorage for two boats. The facility would also have a crane for loading maintenance materials and equipment onto the boats and specialty equipment to help WSDOT employees provide emergency response to spills.

Reinitiation of Signatory Agency Committee Concurrence Point 2

Since the initiation of Concurrence Point 2 in August 2002, the alternatives for consideration by the SAC had changed in both scope and area. The changes were as follows:

- Further consideration of the 8-Lane Alternative was deferred along with the associated improvement to I-5.
- Improvements to the SR 520/I-405 interchange were removed from the project scope.
- The proposed BRT/HOV lane was reduced to an HOV lane only.

Incidentally, during the legislative funding process, the project name was changed.

Because of these changes, WSDOT reinitiated Concurrence Point 2 with the SAC in June 2004. The following alternatives were proposed for consideration and review:

- No Build (continued operation scenario and catastrophic failure scenario)
- 4-Lane Alternative (with and without expanded pontoons)
- 6-Lane Alternative

The 4-Lane Alternative without expanded pontoons would have been exactly the same as the 4-Lane Alternative, except the pontoons for the floating portion of the Evergreen Point Bridge would have been smaller. These smaller pontoons would have eliminated the future possibility of HCT on the Evergreen Point Bridge, and would have been 1 to 2 feet less draft (depth).

All the agency members of the SAC concurred at that time.

Additional Analysis

The SR 520 Project team considered additional design options recommended by the regulatory agencies, jurisdictions, and communities.

February 2005 Workshop

A workshop was held in February 2005 to consider the following topics:

- **Transit Service Scenarios and Facility Needs.** Develop possible alternatives to the reconstruction of the Montlake Transit Flyer stop, including bus transit service and facilities concepts.
- **Highway Operational Performance Needs Assessment.** Develop recommendations for lane requirements and access points.
- **Fixed and Floating Bridge Design and Construction Review.** Develop recommendations for vulnerability concerns associated with the bridges, review construction methods, discuss long-span bridge options, and discuss the "high-level bridge interchange option."
- **Context Sensitivity and Community Issues.** Develop recommendations for segments of the corridor where context sensitive design principles should be applied.
- **Design Option Development.** Develop various design options for corridor elements present in the Draft EIS.
- **Corridor Design Opportunities.** Identify opportunities to enhance corridor design applying context sensitive principles while ensuring safety and performance.
- **Design Options and Corridor Design Opportunities.** Discuss corridor design opportunities associated with the most promising design options and develop recommendations for blended design options to be considered in the Draft EIS.
- **Early Construction Projects.** Develop recommendations for elements, features, or segments that should be considered for early construction.
- **Context Sensitivity Analysis and Corridor Aesthetics.** Discuss, outline and recommend an approach and timeline to complete an assessment of corridor aesthetics and urban design opportunities.

Seattle Tube/Tunnel Proposal Analysis

In the fall of 2005, citizens from the Madison Park and Roanoke neighborhoods suggested using a tunnel to connect SR 520 from I-5 to the western edge of the project. Over the course of the fall and winter of 2005, the tunnel concept was presented to multiple community councils and other groups in Seattle.

In December 2005, the SR 520 Project team began a review of the citizen concept for a tunnel, looking at conceptual engineering, cost estimates, and preliminary environmental effects. The team concluded that construction of portions of SR 520 within a tunnel would have benefited certain areas of Seattle in terms of reduced noise levels, localized improvements to air quality, and views. However, the conceptual analysis indicated that there would be major engineering challenges associated with construction (SR 520 Project 2006b). Tunnel design and construction would be significantly more complex than an aboveground structure and could require one-of-a-kind construction techniques. The tunnel concept would provide fewer opportunities for local traffic to access SR 520. The reduction in access could result in increased street congestion in some locations. Effects on the fragile ecosystems of the Arboretum, Marsh Island, and Foster Island would be substantial. Restoration of the natural environment would take decades.

The team believed that there was a strong likelihood that resource agencies with jurisdiction would be unwilling to issue the required permits for tunnel construction. This cost estimate analysis indicated that the concept would add billions of dollars to the SR 520 Project costs.

Based on the analyses and the evaluations, the SR 520 Project team decided not to further evaluate the tunnel concept as an alternative.

Further 8-Lane Alternative Analysis

In 2005, WSDOT's collaboration with SR 520 Project area communities to develop options for the 6-Lane Alternative stirred renewed interest in the 8-Lane Alternative. The Eastside Transportation Association recommended further study of 8 lanes. In response, WSDOT again evaluated an 8-Lane Alternative to see whether it could be combined with different design options to provide relief to I-5 (SR 520 Project 2005a).

Interim findings from the traffic analysis indicated that, during the 2030 morning and afternoon peak periods, the 8-Lane Alternative would not

operate at capacity across the Evergreen Point Bridge—in other words, WSDOT would be building space that would not be fully used. This would occur because congestion outside of the SR 520 Project limits would have kept traffic from reaching the Evergreen Point Bridge. As a result, the demand for traffic with this alternative would not be enough to fill either the new general-purpose lane or the new HOV lane. The 8-Lane Alternative would carry about the same number of people as the 6-Lane Alternative, but many more of them would be in single-occupant vehicles, which is contrary to regional and local policies encouraging greater use of transit and HOVs.

The team's findings also illustrated that, with more cars crossing the lake, more local traffic would be introduced into the area around the University of Washington where additional lane capacity would be required. Additional westbound traffic crossing the Evergreen Point Bridge would continue to be caught in congestion on SR 520 that originates from I-5. Furthermore, additional eastbound traffic destined for areas north or south on I-405 would add to the congestion already present on that corridor.

Further 6-Lane Alternative Analysis

After developing the 6-Lane Alternative, WSDOT identified several optional design improvements that would have reduced its effects and/or enhanced its benefits. Many of these improvements originated during the course of WSDOT's continuing discussions with communities in the SR 520 Project area. WSDOT's work with the communities identified the following goals:

- Narrow the width of the 6-Lane Alternative
- Improve transit connections
- Improve HOV access
- Design the project to enhance local communities
- Design a facility that is structurally feasible and cost-effective
- Preserve options for future HCT
- Provide a more reliable transit connection to the proposed Sound Transit University Link light rail station at Husky Stadium

WSDOT convened two workshops to consider a list of possible design options that could reduce the footprint of the 6-Lane Alternative in both

Seattle and the Eastside, provide better transit opportunities in the corridor, and address community issues, including the Montlake community's interest in an elevated SR 520 bridge through the neighborhood.

Options identified in these workshops were evaluated through two screening processes: one for options in Seattle and another for options on the Eastside. Through the two screening processes, eight potential options to the 6-Lane Alternative (four in Seattle and four on the Eastside) were selected to evaluate further. A detailed environmental evaluation is provided in the 6-Lane Alternative Options Report dated August 24, 2005, and included in the Draft EIS (WSDOT 2006).

Four options to the original 6-Lane Alternative that could have affected the Seattle area were evaluated:

1. Six lanes with Pacific Street interchange option
2. High six Lanes with Pacific Street interchange option
3. No Montlake Freeway Transit Stop option
4. Second Montlake Bridge option

The high six lanes with Pacific Street interchange option (described in the next subsection) was evaluated but eliminated from further consideration in the Draft EIS.

One of the Eastside options, the bicycle/pedestrian path to the north option, was integrated into the original 6-Lane Alternative. This option replaced the bike path on the south side of the bridge. This change was incorporated in the base design for the Seattle area as well. The 2006—Alternatives Evaluated in the Draft EIS section provides additional details about the options that were carried forward.

High 6 Lanes with Pacific Street Interchange Option

Toward the end of 2005, the SR 520 Project team considered the high six lanes with Pacific Street interchange option for the west end of the 6-Lane Alternative. The option had its basis in a suggestion from the Montlake community that WSDOT consider a distinctive bridge in this area.

The use of a suspension or cable-stayed bridge structure was eliminated for the reasons described below (SR 520 Project 2005b).

- **Suspension Bridge**. WSDOT determined that a suspension bridge would not work for the following three primary reasons:
  - Suspension bridges need to travel in a fairly straight line, which would not have been possible within the curved corridor at the location.
  - A connection could not have been made to the new Pacific Street interchange over Marsh Island.
  - The height of the three to four support towers for a suspension bridge, at approximately 630 feet, would have been nearly the height of the Space Needle and out of character with the surroundings.
- **Cable-Stayed Bridge**. WSDOT determined that a cable-stayed bridge had two primary fatal flaws that made it infeasible in the area.
  - With such a high bridge, noise would have reached a larger group of neighborhoods in the area than the 6-Lane Alternative's proposed structure. It was highly likely that sound walls could not be installed on that type of structure because of instability that would be created with wind. Without sound walls, it would have been nearly impossible to mitigate noise issues.
  - Similar to the suspension bridge, the size and scale of the support towers, at nearly 500 feet in height, was also an issue.

Instead, the high six lanes with Pacific Street interchange option that was proposed included bridges that would have been similar to those in the 6-Lane Alternative, but higher. Through further work, WSDOT and the community determined that a lower version of the Pacific Street interchange design would have a virtually identical footprint and would provide the same transportation benefits, but would have fewer visual effects because of its lower height. Thus, the high six lanes with Pacific Street interchange option was dropped from further consideration in December 2005.

Signatory Agency Committee Concurrence Point 2 Revisited

The process to seek SAC concurrence on the SR 520 Project alternatives to be evaluated in the Draft EIS was originally begun in 2002. In June 2004, this process was reinitiated because of changes in the project area and the alternatives proposed for consideration and review.

During 2005 outreach efforts, WSDOT heard strong community reaction to the proposed SR 520 Project alternatives. Together with the affected communities, the agency developed a series of options for the 6-Lane Alternative. Based on those developments, WSDOT again revisited Concurrence Point 2 with the SAC.

Concurrence was sought from the SAC in March 2006. All agencies concurred with the new alternatives except the U.S. Fish and Wildlife Service and NOAA Fisheries. Both agencies objected to the proposed location of the Pacific Street interchange option and expressed concern that the location could have substantial effects on locally rare, near-shore habitats, as well as wetlands and migratory routes for listed fish species.

WSDOT met with the agencies in October 2006 to further discuss their concerns with the project alternatives and clarify the proposal. Both agencies ultimately waived their opportunity to concur or object, allowing the SR 520 Project to keep moving forward.

Summary of Alternatives Considered

The No Build, 4-Lane, and 6-Lane Alternatives were carried forward into the Draft EIS and are discussed in more detail in the following sections. The alternatives and options related to the 8-Lane Alternative, the tube and tunnel, and the cable-stayed and suspension bridges were not recommended for further evaluation. (See also Exhibit 1 and Attachments 1 and 2.)

2006—Alternatives Evaluated in the Draft EIS

The SR 520 Bridge Replacement and HOV Project Draft EIS evaluated the following Westside alternatives and options (WSDOT 2006, Chapter 3):

- No Build Alternative
  - Continued Operation Scenario
  - Catastrophic Failure Scenario
- 4-Lane Alternative
  - Option with pontoons without capacity to carry future HCT
- 6-Lane Alternative

2006 Alternatives Evaluated in the Draft EIS

The alternatives evaluation process for the Draft EIS is described in this discipline report. The Westside alternatives and options evaluated were:

- No Build Alternative
  - Continued Operation Scenario
  - Catastrophic Failure Scenario
- 4-Lane Alternative
  - Option with pontoons without capacity to carry future HCT
- 6-Lane Alternative
  - Pacific Street Interchange option
  - No Montlake Freeway Transit Station option
  - Second Montlake Bridge option

A preferred alternative was not identified in this process.

- Pacific Street interchange option
- No Montlake Freeway Transit Station option
- Second Montlake Bridge option

The following subsections summarize the alternatives studied in the Draft EIS (WSDOT 2006, Chapter 3).

No Build Alternative

FHWA and NEPA regulations require that a No Build Alternative be analyzed as part of environmental review (40 CFR 1502.14[b] and [d]). The No Build Alternative provides a baseline against which project analysts can measure and compare the effects of all the Build Alternatives.

The No Build Alternative in the Draft EIS assumed that the existing highway would remain exactly the same as it is today. However, the existing Evergreen Point Bridge may not have remained intact through 2030, the project's design year. This meant that the No Build Alternative had to consider the very real possibility that the bridges will fail if they are not replaced.

If nothing is done to replace the Portage Bay and Evergreen Point bridges, one or both structures could fail and become unusable before 2030. WSDOT cannot predict when or how these structures might fail, so there is no certainty about the consequences of doing nothing. To illustrate what could happen, the project team developed two scenarios to describe what might occur if the project were not built. These two No Build Alternative scenarios were 1) continued operation of SR 520, and 2) catastrophic failure of SR 520.

Continued Operation Scenario

Under the Continued Operation Scenario, SR 520 would continue to operate as it does today—a 4-lane highway with nonstandard shoulders and without a bicycle/pedestrian path. No new facilities would be added and none would be removed. WSDOT would continue to manage traffic using its existing TDM and intelligent transportation system strategies.

This scenario assumed 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 be severe enough to cause major damage to the bridges. This scenario

provided the baseline to which the project team compared the other alternatives.

Catastrophic Failure Scenario

Under the Catastrophic Failure Scenario, both the Portage Bay and Evergreen Point bridges would be lost because of some kind of catastrophic event. Although in an actual catastrophic event, one structure might fail while the other remained standing, the Draft EIS assumed the worst-case scenario—that both bridges would fail or would be so seriously damaged that they would not be available for public use for a lengthy period of time.

4-Lane Alternative

As described previously, the 4-Lane Alternative was initially proposed during the Trans-Lake Project as a "Minimum Footprint" Alternative that would essentially duplicate the existing corridor with its narrow shoulders. This alternative was intended to enhance safety by replacing the two vulnerable bridges, but would do nothing to increase SR 520's transportation value. The 4-Lane Alternative that was evaluated in the Draft EIS was changed to include standard shoulders for greater safety and reliability.

As its name suggests, the 4-Lane Alternative would have two 12-foot-wide general-purpose lanes in each direction, the same number and type of lanes as today. SR 520 and its bridges would be rebuilt from I-5 to Bellevue Way. Roadway shoulders would meet current design standards, which, for a 4-lane roadway, require a 4-foot-wide inside shoulder and a 10-foot-wide outside shoulder. New facilities would collect and treat stormwater runoff from the roadway surface. WSDOT would build sound walls along much of SR 520 in Seattle and on the Eastside. These sound walls would substantially reduce the effects of traffic noise on areas near SR 520.

A bicycle/pedestrian path would follow the north side of SR 520 through Montlake and across the Evergreen Point Bridge, crossing to run along the south side of SR 520 through the Eastside to 96th Street NE. The 4-Lane Alternative would also provide a new bridge operations facility for SR 520 beneath the east approach structure on the east shore of Lake Washington. Other features of the 4−Lane Alternative would have included electronically collected tolls and a flexible transportation plan.

Tolls would have been collected using data from transponders carried in vehicles. This alternative would be designed to be compatible with the future addition of HCT in the SR 520 corridor. As noted earlier, an option to build the bridge with smaller pontoons that would not have allowed future HCT was also considered, although this would have been inconsistent with regional transportation planning goals.

Exhibits 4 and 5 show key features of the 4-Lane Alternative in Seattle.

WSDOT would rebuild four bridges over SR 520 to provide room to widen the highway: 10th Avenue East, Delmar Drive East, Montlake Boulevard, and 24th Avenue East.

The SR 520 Project would remove the existing Lake Washington Boulevard ramps and ramps from the never-completed R.H. Thomson Expressway. A new westbound off-ramp to Lake Washington Boulevard and a new eastbound on-ramp from Lake Washington Boulevard would pass over the WSDOT-owned peninsula west of the Arboretum, instead of crossing over water as the existing ramps do.

WSDOT would build sound walls along both sides of SR 520 throughout most of the project corridor. Exhibits 4 and 5 show the locations of the proposed sound walls in Seattle, which would total about 5.6 miles with heights ranging from 6 to 22 feet above the roadway surface.

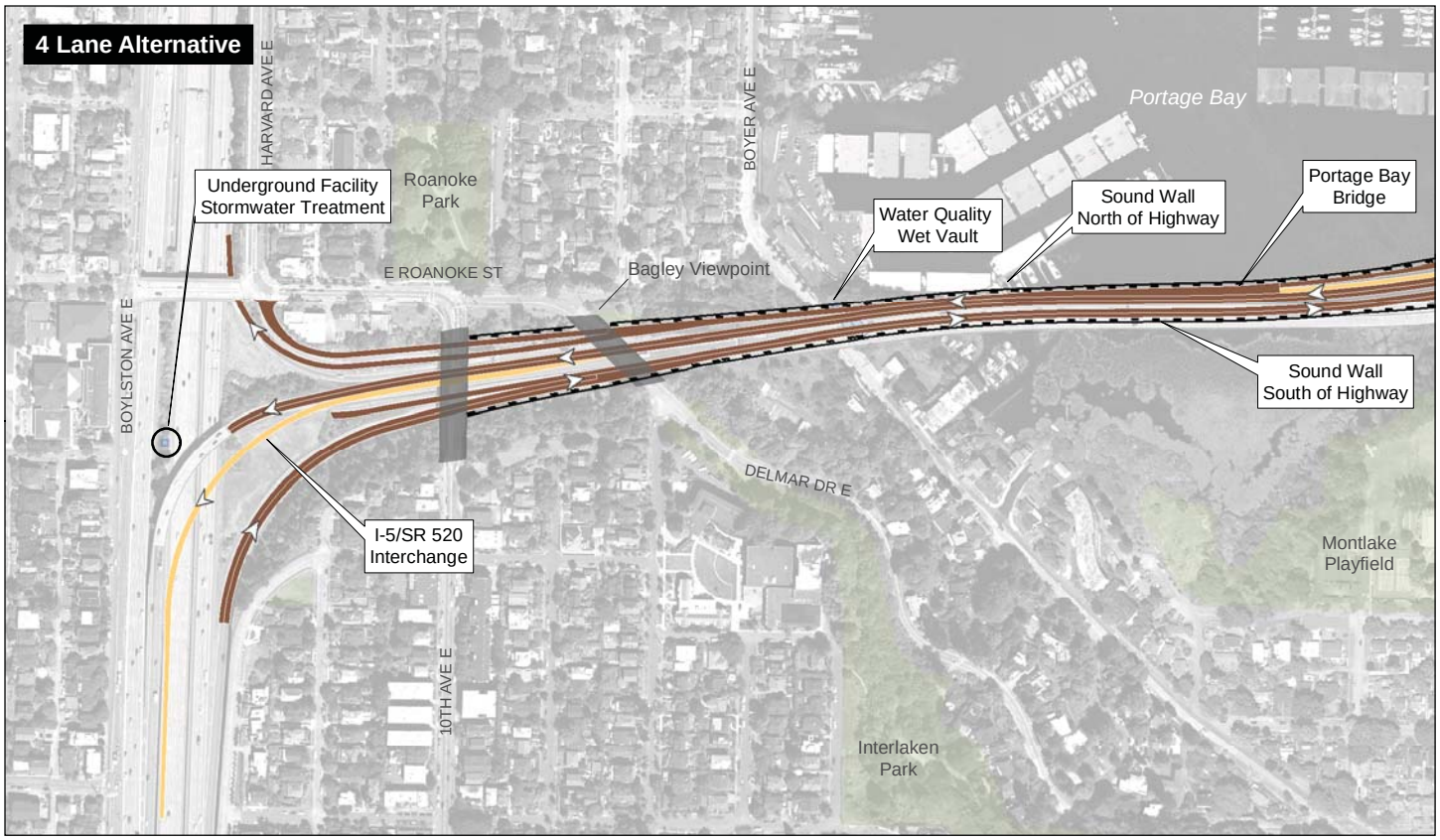
4-Lane Alternative—Conclusion

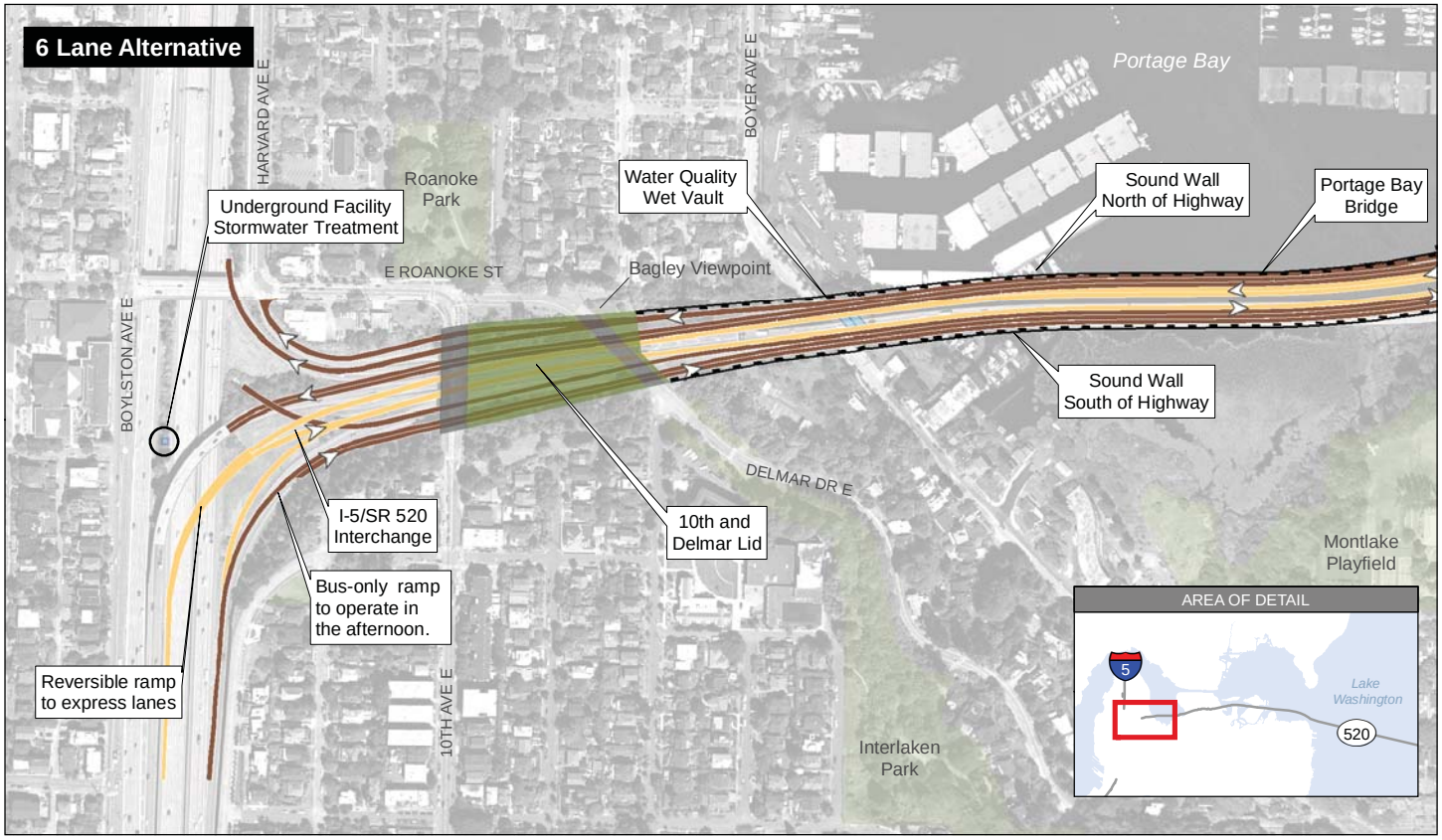
The 4-Lane Alternative was not carried into the SDEIS because it did not meet the purpose and need. It did not sufficiently improve the mobility of people and goods through the corridor.

6-Lane Alternative

The 6-Lane Alternative evaluated in the Draft EIS would complete the regional HOV connection across SR 520. (Exhibits 4 and 5 show key features of the 6-Lane Alternative in the Seattle area.) In addition to two general-purpose lanes in each direction, it would also include one inside HOV lane in each direction.

SR 520 and its bridges would be rebuilt from I-5 to 108th Avenue NE in Bellevue, with an auxiliary lane added on SR 520 eastbound from east of I-405 to 124th Avenue NE. Roadway shoulders would meet the current design standards for a 6-lane roadway, with 10-foot-wide inside shoulders and 10-foot-wide outside shoulders. New facilities would collect and treated stormwater runoff from the roadway surface.





Potential Sound Wall

Lid or Landscape Feature

Stormwater Facility

Park

General-Purpose Lane

HOV, Direct Access, and/or Transit-Only Lanes

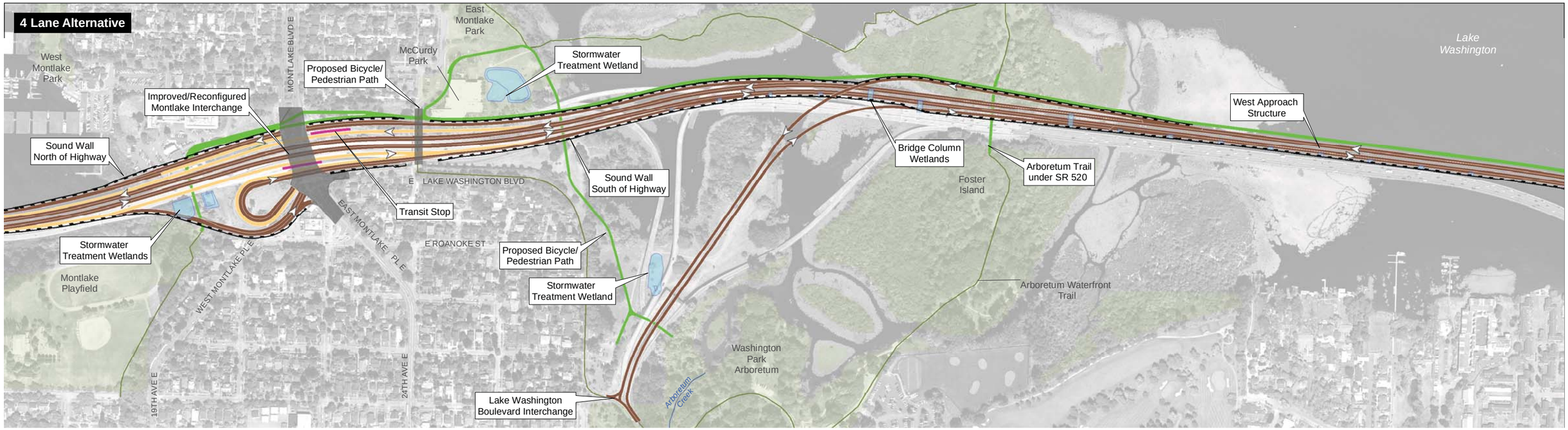
N

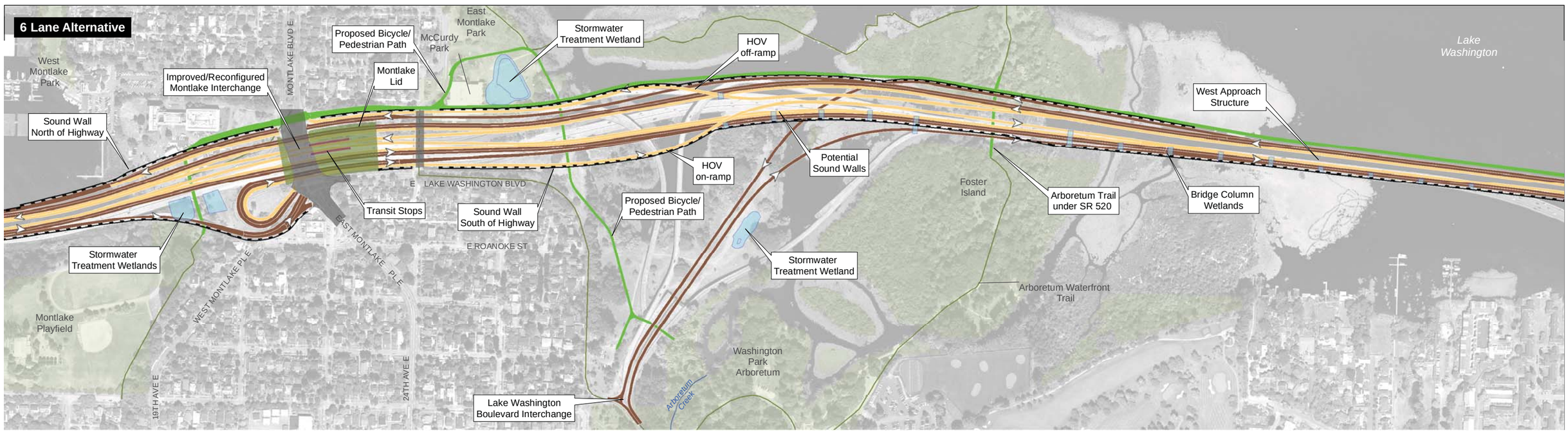
0 200 400 800 Feet

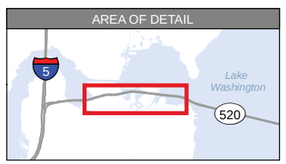
Source: King County (2006) Aerial Photo, CH2M HILL (2008) GIS Data (Park). Horizontal datum for all layers is NAD83(91); vertical datum for layers is NAVD88.

Exhibit 4. **Draft EIS 4-Lane and 6-Lane Alternatives from I-5 to Portage Bay**

I-5 to Medina: Bridge Replacement and HOV Project







- Potential Sound Wall
- Existing Regional Bicycle/Pedestrian Path
- Lid or Landscape Feature
- Proposed Bicycle/Pedestrian Path
- Stormwater Facility
- General-Purpose Lane
- HOV, Direct Access, and/or Transit-Only Lanes
- Transit Stop
- Park

N

0 250 500 1,000 Feet

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

Exhibit 5. **Draft EIS 4-Lane and 6-Lane Alternatives from Portage Bay to Lake Washington**

I-5 to Medina: Bridge Replacement and HOV Project

\\SIMBA\PROJ\PARAMETRIX\180171\GIS\MAPFILES\SDEIS\APPENDIXZ\SDEIS_DR_ALT_PROJECTFOOTPRINT4_6LANE_PORTAGE2LAKEWA.MXD 11/20/2009

As with the 4-Lane Alternative, WSDOT would build sound walls along much of SR 520 in Seattle and the Eastside. A 14-foot-wide bicycle/pedestrian path would follow the north side of SR 520 through Montlake and across the Evergreen Point Bridge, and run along the south side of SR 520 through the Eastside. A new bridge operations facility would be built into the east approach structure abutment on the eastern shore of Lake Washington.

Like the 4-Lane Alternative, the 6-Lane Alternative would include an electronic toll collection system. The floating section of the Evergreen Point Bridge would be designed to accommodate the future addition of HCT in the SR 520 corridor.

An additional feature of the 6-Lane Alternative that was not included in the 4-Lane Alternative was five 500-foot-long lids across SR 520. The lids would help mitigate the widening of the footprint required for the two additional lanes. Two of the lids would be in Seattle: one connecting Roanoke Park with North Capitol Hill, and the other connecting the Montlake neighborhood across SR 520. On the Eastside, there would be lids at Evergreen Point Road, 84th Avenue NE, and 92nd Avenue NE. Exhibit 6 shows several ideas presented by local residents on how these lids might look.

Four bridges over SR 520 would be rebuilt to provide room to widen the highway—10th Avenue East, Delmar Drive East, Montlake Boulevard, and 24th Avenue East. The sound walls for the 6-Lane Alternative would be similar to those for the 4-Lane Alternative. Exhibits 4 and 5 show the locations of the proposed sound walls in Seattle, which would total about 5 miles in length, with heights ranging from 8 to 18 feet above the roadway surface.

Exhibit 6. Draft EIS Community Ideas for Design of the Seattle Lids (WSDOT 2006, Chapter 3)

6-Lane Alternative Options

Three potential options for the 6-Lane Alternative in Seattle, as shown in Exhibits 7 and 8, could be added to the 6-Lane Alternative either individually or in a variety of combinations.

They would change the proposed design of the 6-Lane Alternative in specific locations:

- Pacific Street interchange option
- No Montlake Freeway Transit Stop option
- Second Montlake bridge option

The following subsections describe the three options for the 6-Lane Alternative in Seattle that were evaluated in the Draft EIS.

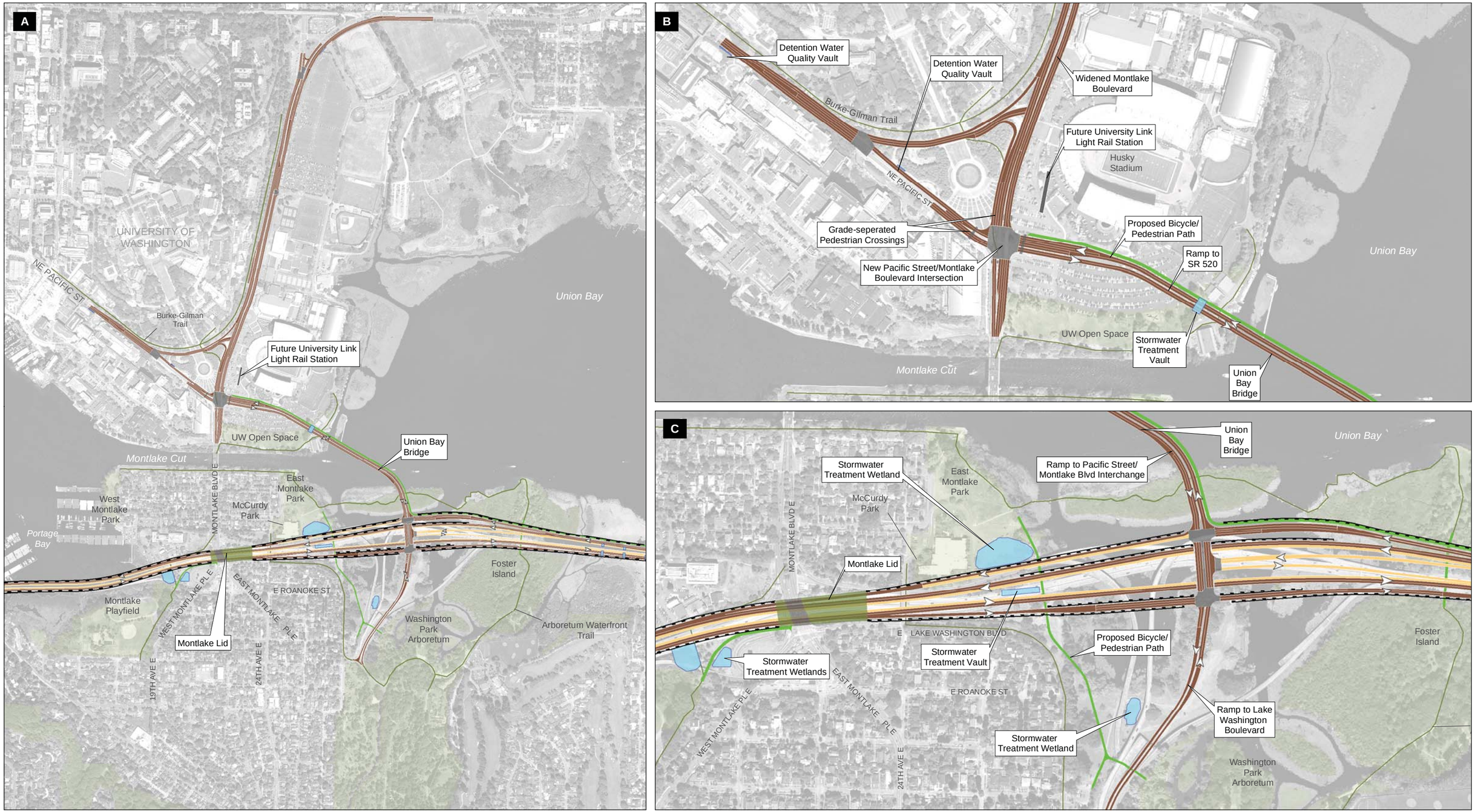
Pacific Street Interchange Option

The Pacific Street interchange option would eliminate the existing Montlake interchange, replacing it with a new connection between SR 520, Lake Washington Boulevard, and the intersection of Montlake Boulevard and Pacific Street near the University of Washington campus.

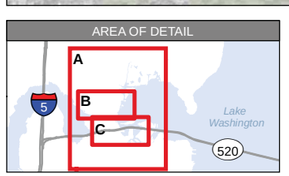
From a new interchange located about 2,000 feet east of the Montlake interchange, a new bridge would cross Union Bay and the Ship Canal and pass south of Husky Stadium (Exhibit 7). Much of the new interchange would be located over the WSDOT-owned peninsula near the Washington Park Arboretum. Some of it would be within the Arboretum over parts of Foster and Marsh islands. The bridge over Union Bay would be four lanes wide and include a 14-foot-wide bicycle path. It would not include HOV lanes because the bridge and intersections would operate with low or moderate congestion, and adding separate lanes for HOVs would not provide a travel time advantage. To ensure adequate clearance for large ships, the bridge would provide a minimum of 110 feet of vertical clearance above the Ship Canal water surface.

The Pacific Street extension would pass through a part of what is now the Husky Stadium parking lot and then join the existing intersection of Pacific Street and Montlake Boulevard.

The intersection would be lowered by 8 to 10 feet and bridged to provide pedestrian access across Montlake Boulevard and Pacific Street. North of the intersection, the option would widen Montlake Boulevard by one northbound lane to just east of the NE 45th Street viaduct and by one southbound lane between Pacific Street and 25th Avenue NE.



AREA OF DETAIL



- Potential Sound Wall
- Existing Regional Bicycle/Pedestrian Path
- Lid or Landscape Feature
- Proposed Bicycle/Pedestrian Path
- Stormwater Facility
- General-Purpose Lane
- HOV, Direct Access, and/or Transit-Only Lanes
- Park

N

0 250 500 1,000 Feet

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

Exhibit 7. **Draft EIS Pacific Interchange Option from Portage Bay to Lake Washington**

I-5 to Medina: Bridge Replacement and HOV Project

\\SIMBA\PROJ\PARAMETRIX\180171\GIS\MAPFILES\SDEIS\APPENDIXZ\SDEIS_DR_ALT_PROJECTFOOTPRINTPACIC_PORTAGE2LAKEWA.MXD 11/20/2009

Potential Sound Wall
Lid or Landscape Feature
Bike/Pedestrian Path
Stormwater Facility
General-Purpose Lane
HOV, Direct Access, and/or Transit-Only Lanes
Park

N
0 200 400 800 Feet

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

Exhibit 8. **Draft EIS Second Montlake Bridge and No Montlake Freeway Transit Stop Option**

I-5 to Medina: Bridge Replacement and HOV Project

This option would give SR 520 a smaller footprint across Portage Bay. From Montlake to I-5, SR 520 would be six lanes wide (three in either direction) compared to nine lanes for the 6-Lane Alternative. The two auxiliary lanes and the westbound acceleration lane from the Montlake Freeway Transit Station would not be needed because the station would be removed and the new interchange located farther east. This would increase the distance between the interchange and I-5 to a more optimal spacing for traffic operations, allowing vehicles to safely get up to speed when merging onto SR 520 and safely decrease speed when exiting SR 520.

This option would improve access to and from northeast Seattle and alleviate existing congestion in the Montlake interchange area. It would also provide a more reliable transit connection to the Sound Transit University Link light rail station at Husky Stadium than the 6-Lane Alternative because buses coming from SR 520 to the Pacific Street bus stops would not be affected by congestion on Montlake Boulevard. This option would require some major changes in transit service to address elimination of the freeway transit station, including additional transit service.

Evaluating the Pacific Street Interchange Option

At the eastern edge of the Seattle project area, SR 520 passes through a wealth of cultural and natural resources: the historic Montlake neighborhood; Washington Park Arboretum's trails and wetlands; Lake Washington Boulevard; shoreline areas of East Montlake and McCurdy parks; and the open water of Union Bay. The existing roadway affects all of these resources, as would each of the alternatives. To balance resource protection with the key project goals of safety and mobility, WSDOT developed two locations for the Pacific Street interchange—south of Marsh Island and east of Foster Island. These locations were evaluated in a screening process using the same transportation and environmental criteria used to screen the alternatives considered for the SR 520 Project. At the request of resource agencies, WSDOT developed and screened a third potential location along the shoreline, just east of the existing Montlake interchange.

Each possible location of the interchange represents tradeoffs among several factors. One critical factor is the safety of motorists on SR 520. Ensuring safety requires that curves and slopes be gradual and smooth, and that adequate distance be provided for motorists to change lanes as they enter and leave the highway.

A particular concern is the distance between the interchange and I-5; under existing conditions, the limited distance between the Montlake interchange and the I-5 ramps creates dangerous weaving movements as westbound drivers try to change lanes within a short distance on an uphill grade. More room for drivers to change lanes makes the highway safer.

Another key factor in interchange location is minimizing the negative effects on the neighborhoods and parks through which SR 520 passes. These effects include the need to acquire right-of-way as well as the noise and visual intrusion that a large highway can create.

Equally important is WSDOT's desire to minimize filling and shading of the wetland, aquatic, and shoreline habitats in the Arboretum and Union Bay. These areas support endangered salmon; eagles; and many other species of fish, birds, and wildlife. Every alternative and option being considered for this project affects each of these factors to some degree. WSDOT's objective is to gain the greatest possible transportation benefit with the least possible environmental effect.

The results of the screening evaluation showed the following:

- An interchange east of Foster Island would require that WSDOT build a 4,000-foot-long bridge over Union Bay, affecting much more aquatic habitat than any other option. It would not be feasible to build ramps to and from Lake Washington Boulevard, so this option would create additional traffic congestion in Montlake and at the south end of the University of Washington. A location over Foster Island was ruled out because, in addition to being a park, this area has a long history of use by Native Americans and is very likely to contain archaeological sites.
- A shoreline location just east of the Montlake interchange could still challenge drivers trying to merge safely. To solve this problem, WSDOT would need to add an auxiliary lane in each direction, which would increase the width of the Portage Bay Bridge and place additional columns in the water.
- This interchange location would eliminate McCurdy Park and permanently occupy approximately 3 acres of East Montlake Park, including the entire shoreline. The new bridge over the Montlake Cut would require a maximum 70-foot vertical clearance for vessels going to and from the lake (a higher vertical clearance would result in unacceptably steep grades). This roadway would be prominent

in the foreground from the University of Washington's Rainier Vista.

- An interchange south of Marsh Island (Pacific Street interchange option) would span Union Bay with a new roadway that would touch down south of Husky Stadium. This interchange would be at a far enough distance from I-5 that drivers would have ample room to merge. As such, no auxiliary lanes would be required, resulting in a narrower bridge width across Portage Bay. The new bridge over Union Bay could provide a maximum of 110 feet of vertical clearance for vessels going to and from the lake, while still maintaining acceptable grades for driver safety. The interchange would place several additional columns in Union Bay, but would result in comparatively fewer effects on park areas and adjacent neighborhoods than the interchange location along the East Montlake shoreline. The bridge would be comparatively less prominent from the Rainier Vista.

WSDOT weighed the advantages and disadvantages of three interchange locations and determined that the interchange south of Marsh Island was the best. It would provide a greater level of safety to drivers, minimize effects on parks and neighborhoods, and have only slightly greater net effects on aquatic habitat compared to the 6-Lane Alternative or the interchange location along the east Montlake shoreline. As a result, WSDOT moved forward with the Pacific Street interchange location south of Marsh Island.

No Montlake Freeway Transit Stop Option

The No Montlake Freeway Transit Stop option (Exhibit 8) would eliminate the Montlake Freeway Transit Station. This would narrow the footprint of the 6-Lane Alternative through Montlake by as much as 40 feet, and also would reduce the width of the Portage Bay Bridge to eight lanes (one less than the 6-Lane Alternative). Depending on their destination, bus riders who currently use this stop would instead board buses or use the proposed Sound Transit University Link light rail service via the Pacific Street transfer point or in downtown Seattle.

> 6-Lane Alternative—Conclusion
>
> The 6-Lane Alternative met all three of the SR 520 Project's goals. The alternative was evaluated in the Draft EIS and has been carried forward to this SDEIS with additional options developed during the mediation process (*see* SR 520 Mediation Process section).

Second Montlake Bridge Option

The second Montlake Bridge option would narrow SR 520 through the Montlake neighborhood while continuing to provide transit access from SR 520 to the University of Washington (Exhibit 8). This option could improve traffic operations through the corridor by increasing capacity

across the Montlake Cut. It would be the same as the No Montlake Freeway Transit Stop option (discussed previously), except that it would also include a new drawbridge across the Montlake Cut, parallel to the existing Montlake Bridge. The new bridge would carry three lanes of northbound traffic, and the existing bridge would carry three lanes of southbound traffic. Eliminating the Montlake Freeway Transit Station would reduce the width of the Portage Bay Bridge to eight lanes with this option, compared to nine lanes with the 6−Lane Alternative.

Conclusions of the Draft EIS

NEPA allows lead agencies to identify a preferred alternative at the Draft EIS stage or to wait until the Final EIS is published. WSDOT, FHWA, and Sound Transit chose not to identify a preferred alternative until after the Draft EIS was issued and the public had an opportunity to comment on the choices. The Draft EIS was published August 18, 2006.

The Draft EIS confirmed that the 4-Lane Alternative would meet only two of the project's key goals. It would not meet the third goal of increasing mobility for people and goods. While the alternative included roadway shoulders that would help reduce congestion caused by accidents or disabled vehicles, no additional travel lanes would be added. Therefore, the 4-Lane Alternative would do little to advance the third goal.

The Draft EIS was published with a section in Chapter 9 called *Do any areas of controversy remain to be resolved?* The section lists several areas where issues remained to be resolved, including the width of the 6-lane Alternative, effects to aquatic resources, neighborhood traffic, and potential archaeological resources. In addition, over 1,700 unique comments were submitted. Key areas of interest were wetlands, bicycle/pedestrian access, neighborhoods and communities, traffic, and transportations systems.

The formal 45-day comment period started on August 18, 2006, and was extended to October 31, 2006. The public comments received are summarized in the Draft EIS Comment Report (WSDOT 2006b).

This SDEIS is a result of a process to address the comments and outstanding issues. Once additional comments are received on this SDEIS, a preferred alternative is expected to be selected, and a final Environmental Impact Statement will identify the Draft EIS and SDEIS comments and how they were addressed.

Creation of the Regulatory Agency Coordination process (RACp) and associated technical working groups (TWGs) strengthened and focused agency and tribal coordination after publication of the Draft EIS. This process, which provided a regular opportunity to share project information with agencies in real time, has engaged agencies and tribes in collaborative efforts to address topics of mutual interest. By setting a regular monthly meeting schedule, agencies have been able to anticipate and engage frequently and effectively in project meetings.

Moreover, with the dissolution of the Signatory Agency Committee in April 2009, WSDOT and the RACpformed a more inclusive agency coordination forum than the SAC to better engage participants at key project milestones. (See *Regulatory Agency Coordination Process and Technical Working Groups* section.) Additional efforts and activities have bolstered agency coordination (for example, individual briefings and meetings with agency executives).

The next section of this discipline report discusses events leading to the decision to undertake a Supplemental Draft EIS to evaluate new design options and respond to public and agency comments on the Draft EIS. The conclusions and next steps in the NEPA process are discussed in the *Progress and Next Steps* section.

2007 to 2008—SR 520 Mediation Process

2007–2008 SR 520 Mediation Process

The SR 520 mediation process, conducted under a bill from the Legislature, included additional stakeholder input and provided information for the SDEIS.

In December 2006, in a report entitled A Path Forward to Action, Governor Christine Gregoire identified the 6-Lane Alternative as the State's preference for the SR 520 corridor (WSDOT 2009, Chapter 1). However, the Governor noted the diversity of public opinion expressed in the Draft EIS and public outreach efforts regarding the configuration and effects of the 6-Lane Alternative and its design options. She directed City of Seattle and community leaders and residents to develop a common vision on the best solution that fits the character and needs of the local communities, and asked WSDOT to provide support when requested for such a process.

In spring 2007, the Washington State Legislature passed Engrossed Substitute Senate Bill 6099. The bill directed the Office of Financial Management to hire a mediator and appropriate planning staff to develop a 6-lane corridor design for the Seattle portion of the SR 520 Project area. Specifically, the bill directed the mediation group to prepare a Project Impact Plan (PIP) to address the effects of the SR 520

Project's design on Seattle neighborhoods and parks. The bill also directed that the PIP provide a comprehensive approach to mitigating the effects of the SR 520 Project, including incorporating construction mitigation plans (WSDOT 2009, Chapter 1).

In April 2007, the Seattle City Council passed a resolution in support of the preferred (6-lane) alternative identified by Governor Gregoire, and listed design elements and mitigation measures that should be included in design for the Westside portion of the SR 520 Project.

The following subsections provide information about the SR 520 Mediation Process:

- *Participants in Mediation*
- *Objectives of Mediation*
- *Options Developed Through Mediation*
- *Evaluation of Options and Conclusions of the Mediation Process*
- *Relationship between Mediation and the NEPA/SEPA Process*

Participants in Mediation

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 SR 520 Project team. Over the course of 2008, the mediation participants developed and reviewed more than a dozen design options for the configuration of SR 520 through Seattle.

Objectives of Mediation

Early in the process, the objectives of mediation were defined as follows (WSDOT 2008):

- Create a common understanding of the transportation, environmental, neighborhood, and economic issues associated with SR 520 reconstruction.
- Articulate various solutions to these issues in Seattle and explore the advantages and disadvantages of each solution using the legislatively prescribed preferred 6-Lane Alternative as the only basis for discussion.

Organizations Represented in the Mediation Group

WSDOT
Sound Transit
Office of the Governor (representing state agencies, including the Departments of Ecology, Fish and Wildlife, Archaeology and Historic Preservation, Natural Resources, and the Recreation and Conservation Office)
University of Washington
King County Metro Transit
Seattle Mayor's Office
Seattle City Council
Seattle Design Commission
Arboretum Foundation/Arboretum and Botanical Garden Committee
Cascade Bicycle Club
Friends of Seattle's Olmsted Parks
Transportation Choices Coalition
Boating Community
Seattle Chamber of Commerce
Bellevue Chamber of Commerce
Freight Advisory Committee
Montlake Community Council
Madison Park Community Council
Roanoke/Portage Bay Community Council
Laurelhurst Community Council
University District Community Council
North Capitol Hill Community Council
Eastlake Community Council
Ravenna Bryant Community Council
City of Yarrow Point
City of Medina
City of Clyde Hill
City of Hunts Point
City of Bellevue
City of Kirkland
Federal Highway Administration
National Marine Fisheries Service (also representing U.S. Fish and Wildlife Service and tribal fishing interests)
U.S. Coast Guard
Washington State Legislature (one seat available to any legislator who wished to attend a mediation session) with additional options developed during the mediation process.

- Ensure that these possibilities fit with the emerging solutions to the same set of issues on the east side of the lake.
- Arrive, if possible, at a consensus solution.
- Reach agreement on components of the PIP for addressing effects of SR 520 Project design on Seattle neighborhoods, parks, and institutions and ensure that these are integrated into an HCT plan and the SDEIS.

Options Developed Through Mediation

The mediation participants brainstormed design options that were aimed at meeting identified community interests (WSDOT 2008). The design options (designated with letters from A through L) included the following (WSDOT 2009, Chapter 1):

A Redesign of the Montlake interchange options evaluated in the Draft EIS to address Seattle City Council resolution elements and Draft EIS comments.

B Redesign of the Pacific Street interchange design option evaluated in the Draft EIS to address Seattle City Council resolution elements and Draft EIS comments.

C Evaluation of the full tunnel options:

- Tunnel from the floating bridge to I-5 with no access points in Seattle, with a separate 2-lane bus tunnel from the floating bridge to the light rail station, and with a vertical profile 50 feet below grade. Reconfigured I-5 to remove the weave—all entrances/exits would be on the right side. Reclaimed SR 520 right-of-way would be used for a trail and park.
- Tunnel from the floating bridge to I-5 with distributed access points.

D Retrofit of the current 4-lane bridge with a separate 2-lane tunnel for transit to the light rail station (separate structure across the lake and then a tunnel from the floating bridge).

E A car/bus tunnel to the University of Washington, with a submerged exit/entrance just west of the floating bridge under Union Bay that would surface at Pacific Street.

F New Montlake Cut bridge—design would emulate and reflect, but not copy, the historic bridge.

G Tunnel and viaduct—tunnel from the floating bridge under the Washington Park Arboretum with a viaduct through Portage Bay.

H Similar to the Draft EIS Pacific interchange design option, with a refined single-point urban interchange (SPUI) northeast of the Washington Park Arboretum (interchange with two levels), and a bridge to Pacific Street and Lake Washington Boulevard.

I Retrofit with revised alignment and tunnel to the north of the Washington Park Arboretum, with a "people mover" below ground from the flyer stop to the University of Washington and a new Montlake Cut bridge.

J Interchange between the Montlake and Pacific Street interchange options from the Draft EIS, with a short tunnel, a spur to Lake Washington Boulevard, an intersection under the mainline, and no Washington Park Arboretum ramps.

K Tunnel in Washington Park Arboretum and East Montlake interchange with a tunnel under the Montlake Cut to the Pacific Street and Montlake Boulevard East intersection.

L Interchange east of Montlake Boulevard East , with a bridge across the east end of the Montlake Cut instead of a tunnel.

Evaluation of Options and Conclusions of the Mediation Process

Mediation participants evaluated and refined design options at monthly meetings held from November 2007 through February 2008. The meetings included presentations from WSDOT, independent experts, and mediation participants. Several common elements and mitigation recommendations were identified by the mitigation group, including the following (WSDOT 2008):

- A narrower footprint in the most critical areas by removing the Montlake Transit Flyer stop and consolidating ramps or access points that exist today.
- A lower overall profile from what was described in the Draft EIS.

- A common Portage Bay Bridge alignment, with some slight variation on how the bridge aesthetics would be decided.
- A common horizontal alignment from Foster Island to the floating bridge. The height of the bridge would vary.
- Added TDM elements, including transit improvements, which the mitigation group saw as essential. A combination of strategies was proposed, to be discussed with stakeholders once a preferred option is selected. TDM measures should be implemented before, during, and after construction.
- All options would recognize the importance to transit facility and service improvements to address removal of the Montlake Freeway Transit Station. BRT plans have been developed that improve the transit connectivity and access to the Montlake Multimodal Center and University of Washington Station. All options recommended improving north-south transit service to offset removal of the Montlake Freeway Transit Station at SR 520.
- Noise reduction is a top priority during and after construction. The use of quieter pavement and many of the Acoustics Expert Review Panel recommendations is essential. It is recommended that community input to noise reduction measures be considered.
- All options would build green space along the corridor to enhance pedestrian and bicycle flow and connect communities.

In February 2008, mediation members agreed to focus on Options A, K, and L (described below), with suboptions for each. Subsequent meetings of the mediation group focused on refining these options to more closely meet the goals of mediation participants. The following text summarizes the reasons these options were selected for further refinement (WSDOT 2008).

- **Option A** would prioritize preservation of the Washington Park Arboretum by removing the Lake Washington Boulevard ramps that exist today. It would focus on the use of existing transportation corridors to minimize disruption of the area. This option would also minimize the size of the SR 520 roadway by trading off direct transit access to the eastbound SR 520 HOV lanes. Option A would include an aggressive TDM strategy to reduce private auto trips. It would also include establishment of a multimodal Corridor Management Agreement that addresses land use and development actions that

encourage transit (and non-automobile) supportive decisions by local jurisdictions in the corridor. It would be the lowest cost option to construct and result in more efficient arterial traffic operations than the No Build Alternative.

- **Option K** would prioritize moving people as quickly as possible through the SR 520 corridor and on local arterials while keeping the SR 520 roadway and ramps low or out of sight. Based on the initial transportation analysis, it would effectively move people and goods through the system. It would provide a Montlake Boulevard NE and Pacific Street intersection lid for grade-separated pedestrian and bicycle movements. It would maintain access at Lake Washington Boulevard to all movements through that area. It would be the most costly of all options to construct and result in slightly more efficient arterial traffic operations than Options A and L.
- **Option L** was developed to balance the transportation benefits found in Option K with a less costly option to construct. South of SR 520, it would maintain a connection at Lake Washington Boulevard and limit access to reduce the amount of traffic using this access point. It would provide a Montlake Boulevard NE and Pacific Street intersection lid for grade-separated pedestrian and bicycle movements. It would have a higher profile east of Foster Island and build a bascule bridge at the east end of the Montlake Cut, but would not meet any community objective for visual obtrusiveness. It would be slightly more costly to construct than Option A and result in arterial traffic operations similar to Option K.

Relationship between Mediation and the NEPA/SEPA Process

Under NEPA and SEPA, WSDOT and its co-lead agencies (with input from regulatory agencies, elected officials, and the public) developed the alternatives and design options that were evaluated in the Draft EIS. The alternatives and options were screened using a set of evaluation criteria that were based on the SR 520 Project purpose and need statement and adopted by the project's executive, technical, and advisory committees. Each alternative's performance against the criteria was evaluated; the screening results are documented in the SR 520 Project's administrative record (WSDOT 2009, Chapter 1).

The mediation design options evaluated in the SDEIS were generated through a different process, which was not led by WSDOT or the co-lead agencies. However, it was a public process in which many stakeholders participated, including neighborhoods, advocacy groups, and the business community.

Although a number of the regulatory agencies responsible for issuing permits and approvals for the SR 520 Project did not participate directly in mediation, their interests were represented by other participants—in particular, the Governor's Office and NOAA Fisheries. WSDOT also kept permitting agencies informed on the progress of mediation through regular Resource Agency Coordination Process meetings. WSDOT committed to fully evaluate the environmental effects of all design options that emerged from the mediation process in the SDEIS (WSDOT 2009, Chapter 1).

As required by NEPA and SEPA, this SDEIS objectively analyzes and discloses the effects of the design options now being considered. WSDOT has continued to work with resource and permitting agencies and Indian tribes to reflect the regulatory and treaty requirements with which the SR 520 Project must comply. The SDEIS documents the results of this coordination and provides information on how the design options perform with regard to mobility, safety, and environmental effects—the three components of the SR 520 Project's purpose and need. WSDOT anticipates that once the SDEIS analysis is complete, the original SR 520 evaluation criteria will be one of the tools used to identify a preferred design option (WSDOT 2009, Chapter 1).

2009—Development of the SDEIS

This SDEIS responds to the requirements of NEPA and SEPA. Both laws require that projects with potential for significant adverse environmental effects be reviewed in an EIS. The SDEIS identifies alternative ways of meeting the SR 520 Project's purpose and need; evaluates these alternatives' effects, positive and negative, on the natural and built environments; and identifies measures to avoid, minimize, or mitigate negative effects. This process allows decision-makers to consider effects on the environment together with other important considerations such as need, feasibility, and cost. EISs are intended to disclose the effects of a project at a stage where decision-making can still be shaped by the environmental analysis

2009 Development of the SDEIS

The SDEIS identifies alternative ways of meeting the project's purpose and need; evaluates these alternatives' effects, positive and negative, on the natural and built environments; and identifies measures to avoid, minimize, or mitigate negative effects. The following alternatives and options are evaluated in the SDEIS:

- No Build Alternative
- 6-Lane Alternative
  - Option A, which would redesign the Montlake interchange
  - Option K, which would include a new single-point urban interchange and a tunnel beneath the Montlake Cut
  - Option L, which would include a single-point urban interchange and a new bascule bridge over the Montlake Cut

and by the comments of agency and public reviewers (WSDOT 2009, Chapter 1).

The document you are reading is the product of several years of technical analysis by engineers, planners, scientists, and other experts, informed by ongoing comments and suggestions by public officials and citizens. As mediation design options were identified, engineers developed them to a level of detail that would allow the options to be evaluated in the environmental analysis.

This section includes information about the following topics:

- SR 520 Bridge Replacement and HOV Program
- I 5 to Medina Project Alternatives and Options

SR 520 Bridge Replacement and HOV Program

The Draft EIS 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. The four independent projects identified after the Draft EIS was published in 2006 now fall under the umbrella of the entire SR 520 Bridge Replacement and HOV Program. This 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, which begins at I-5 in Seattle and extends to SR 202 in Redmond, consists of the following projects:

- **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.

I-5 to Medina Project Alternatives and Options

The following alternatives and options are evaluated in the SDEIS:

- No Build Alternative (Exhibit 9)
- 6-Lane Alternative (Exhibits 10, 11, and 12)
  - Option A is most similar to today's configuration. It maintains the existing location of the Montlake interchange and adds a new bascule bridge over the Montlake Cut, parallel to the existing Montlake Bridge.
  - Option K includes a new single-point urban interchange about a half mile east of the existing Montlake interchange. The new SPUI ramps would pass below the SR 520 roadway, with the northern leg of the interchange crossing beneath the Montlake Cut in a tunnel.
  - Option L would also include a SPUI with a similar alignment to Option K. However, instead of being beneath the SR 520 mainline, the interchange ramps would rise above it. The northern leg of the interchange would cross the Montlake Cut on a new bascule bridge.

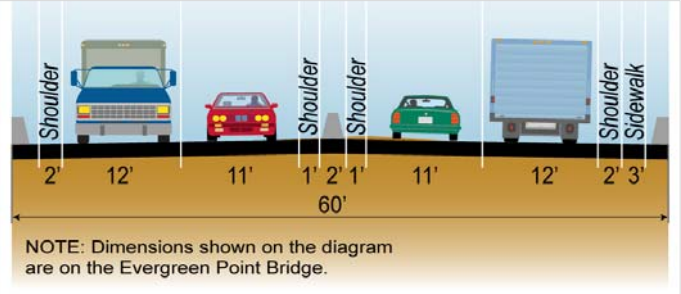


Exhibit 9. SDEIS No Build Alternative Cross Section

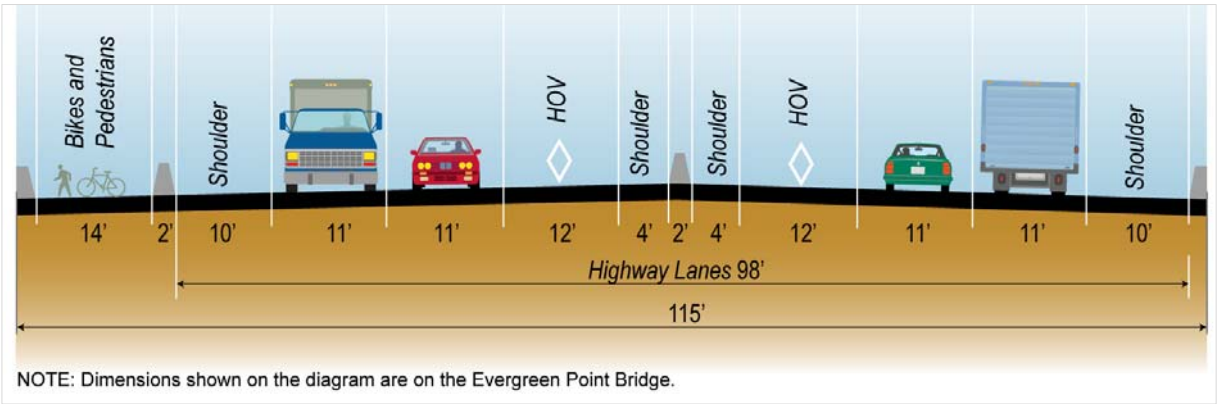
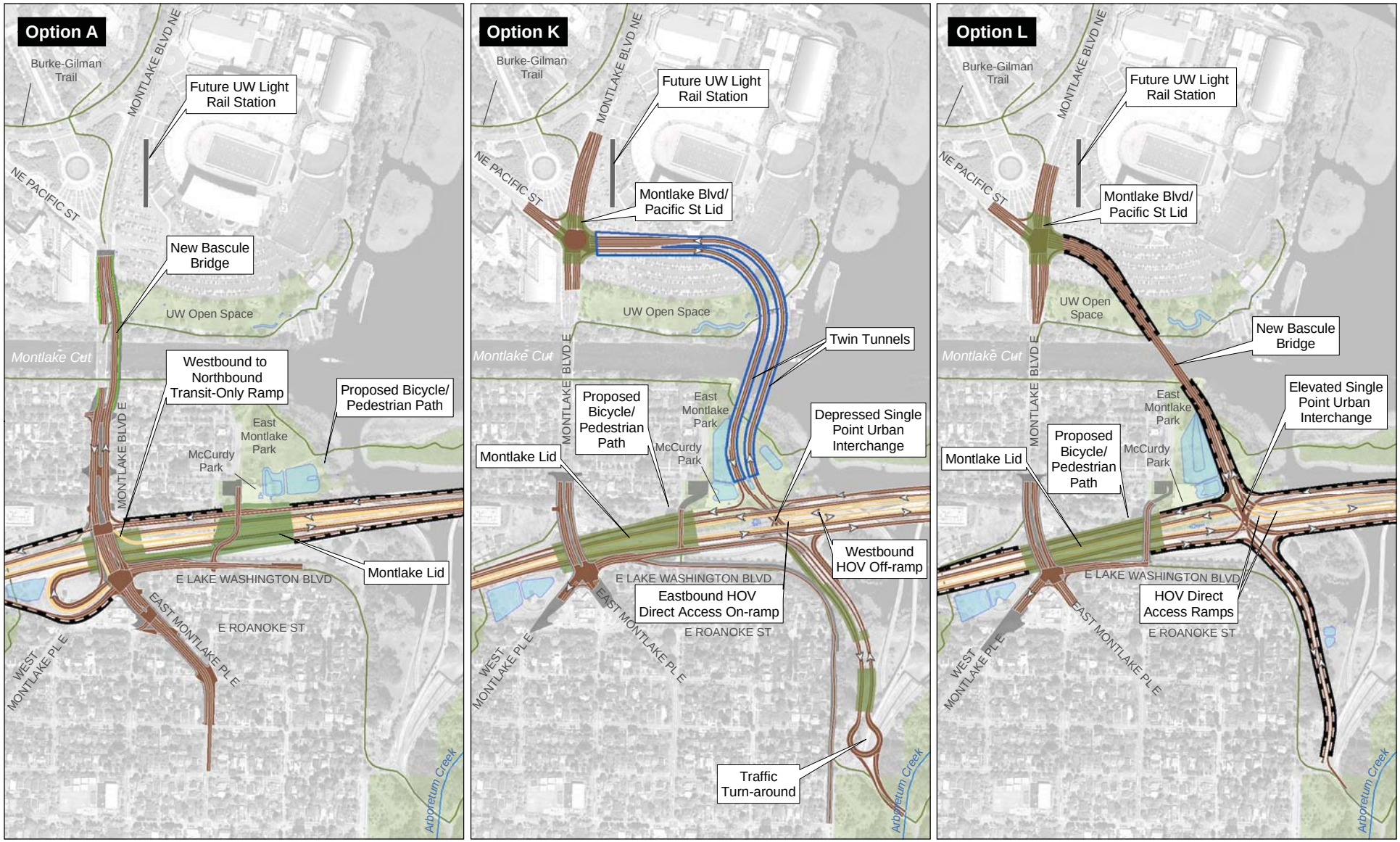
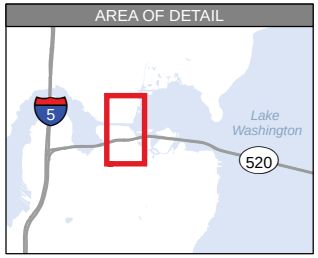


Exhibit 10. SDEIS 6-Lane Alternative Cross Section





- Potential Sound Wall
- Existing Regional Bicycle/Pedestrian Path
- Tunnel
- Lid or Landscape Feature
- Proposed Bicycle/Pedestrian Path
- Stormwater Facility
- General-Purpose Lane
- HOV, Direct Access, and/or Transit-Only Lane
- Future UW Light Rail Station
- Park

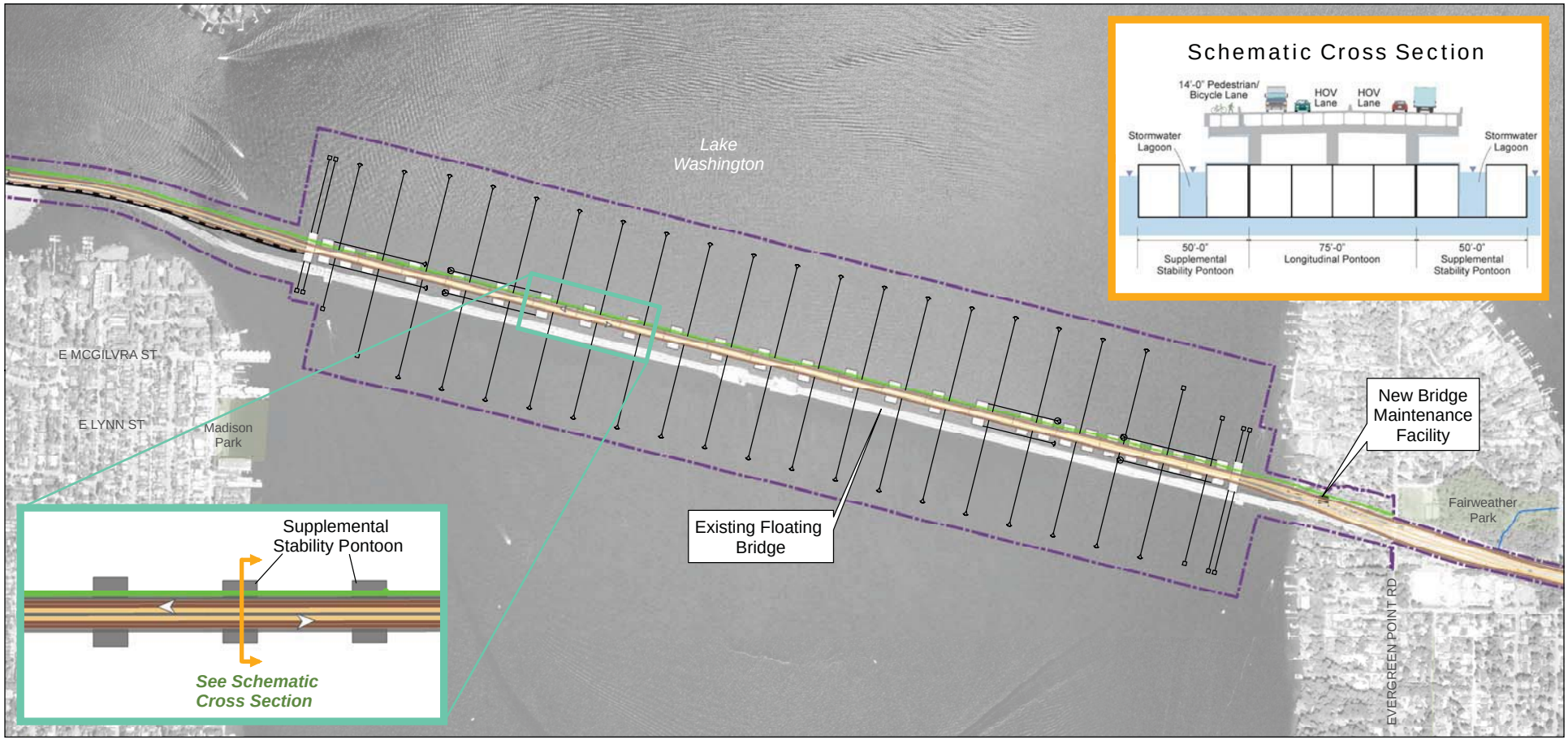
N

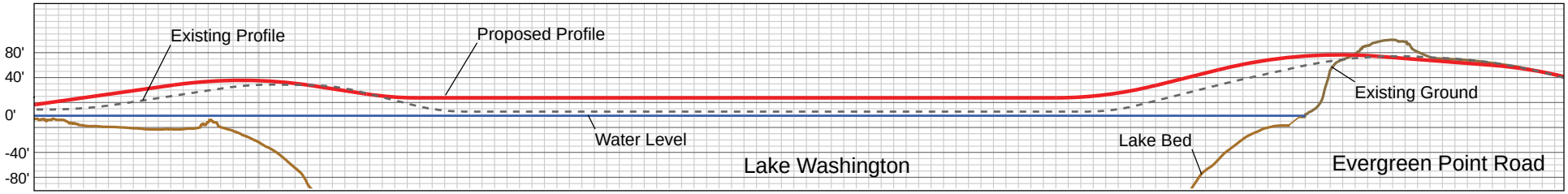
0 250 500 1,000 Feet

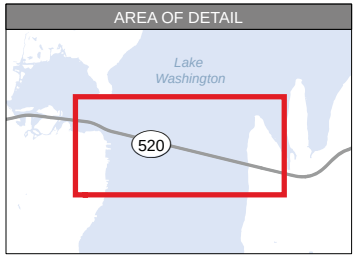
Source: King County (2006) Aerial Photo, King County (2005) GIS Data (Streams), City of Seattle (1994) GIS Data (Bike/Ped Trail), Seattle Bicycle Map (2008) GIS Data (Bike/Ped Trail) CH2M HILL (2008) GIS Data (Park). Horizontal datum for all layers is NAD83(91); vertical datum for layers is NAVD88.

Exhibit 11. **Options A, K, and L: Montlake and University of Washington Areas**

I-5 to Medina: Bridge Replacement and HOV Project







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

N

0 250 500 1,000 Feet

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 12. **6-Lane Alternative at the Evergreen Point Bridge (Common to All Options)**

I-5 to Medina: Bridge Replacement and HOV Project

Progress and Next Steps

NEPA allows lead agencies to propose a preferred alternative with the Draft EIS and use public comment to support that proposal or to support a decision on a preferred alternative described in the Final EIS. As described above, WSDOT and FHWA have designated the 6-Lane Alternative as the preferred alternative. However, a preferred design option for the Westside interchange has not yet been identified. The preferred option will not be identified until the Final EIS, after agencies and the public have had an opportunity to comment on the choices and the legislative work group has released its findings. Based on the current schedule, the co-lead agencies expect to identify a preferred design option for the I-5 to Medina Project in early 2010 (WSDOT 2009, Chapter 1).

The preferred design option may be one of those described in this document, or it may be a minor variation on, or combination of, the existing options. Should any new design variations with significantly greater environmental effects be proposed, they would likely need to be evaluated in another Supplemental EIS, which would change the SR 520 Project schedule (WSDOT 2009, Chapter 1).

After the SDEIS is issued and a preferred alternative is identified, additional analyses can be completed, including archaeological investigations to determine whether any cultural resources are present in the project area, in accordance with the National Historic Preservation Act. Consultation with tribes will continue, both with respect to cultural resource considerations and treaty fishing rights. The results of these additional analyses, including work to define the preferred design option, will be incorporated into the Final EIS, which is planned for publication in late 2010. The Final EIS will also include all comments received on the Draft EIS and the SDEIS during their respective public comment periods, and the lead agencies' responses to these comments (WSDOT 2009, Chapter 1).

Moving forward, the SDEIS and Final EIS will use the SR 520 Legislative Workgroup, which was formed as part of ESHB 2211 enacted in 2009. The group consists of members from the 43rd and 48th legislative districts, the secretary of the Department of Transportation, two legislators from each of the 46th and 45th legislative districts, the chairs of the transportation committee, two additional legislators from the joint transportation committee representing a legislative district

outside the SR 520 corridor, and a member of the transportation commission representing King County.

The Legislative Workgroup will present recommendations on financing and a Westside design in 2010. A Westside subgroup of the workgroup will be created to review existing information regarding design options being considered in this SDEIS.

When the Final EIS has been issued, FHWA, as the federal lead agency, will prepare a Record of Decision (ROD) documenting the chosen course of action. The ROD identifies the selected alternative, explains the alternatives considered, and specifies an "environmentally preferable alternative." It also explains how the lead agencies plan to implement mitigation measures and conservation actions in compliance with NEPA and other laws (WSDOT 2009, Chapter 1).

Although the ROD is the conclusion of the NEPA process, it signals the beginning of project implementation. WSDOT will further develop the engineering design for the SR 520 Project, including additional detail on project phasing, construction staging, and construction techniques. Having a preferred design option also will allow WSDOT to develop more specific designs for mitigation measures, which will be documented in project permit applications. These designs will be prepared by WSDOT and FHWA in cooperation with the affected jurisdictions and resource agencies (WSDOT 2009, Chapter 1).

References and Bibliography

FHWA and FTA 2000. Notice of Intent – Environmental Impact Statement, King County, Washington. Washington, D.C. Federal Highway Administration and Federal Transit Administration

Parametrix 2008. SR 520 Bridge Replacement and HOV Project Westside Project Impact Plan. Prepared for Washington State Joint Transportation Committee and Governor Christine Gregoire.

SR 520 Project 2003a. West End Bridge Design and Stormwater Treatment and Discharge: Minimizing the Impact. Seattle, Washington. SR 520 Bridge Replacement and HOV Project.

SR 520 Project 2004a. SR 520 Eight-Lane Alternative I-5 Options Study. Seattle, Washington. SR 520 Bridge Replacement and HOV Project.

SR 520 Project 2004b. Meeting Summary – SR 520 Replacement and HOV Project Executive Committee – April 13, 2004. Seattle, Washington. SR 520 Bridge Replacement and HOV Project.

SR 520 Project 2004c. Facility Site Location Report. Seattle, Washington. SR 520 Bridge Replacement and HOV Project.

SR 520 Project 2005a. 8-Lane Alternative Report. Seattle, Washington. SR 520 Bridge Replacement and HOV Project.

SR 520 Project 2005b. WSDOT Status Regarding Westside Design Options for SR 520. Seattle, Washington. SR 520 Bridge Replacement and HOV Project.

SR 520 Project 2006a. Expert Review Panel Notebook. Seattle, Washington. SR 520 Bridge Replacement and HOV Project.

SR 520 Project 2006b. Final Assessment of Tunnel Concept – I-5 to Lake Washington. Seattle, Washington. SR 520 Bridge Replacement and HOV Project.

Trans-Lake Washington Project 2000a. Draft Committee Charters. Seattle, Washington.

Trans-Lake Washington Project 2000b. Purpose and Need for the Action – Trans-Lake Washington EIS. Seattle, Washington.

Trans-Lake Washington Project 2000c. Alternatives Analysis – Screening Process and Criteria Adopted by Executive Committee on October 25, 2000. Seattle, Washington.

Trans-Lake Washington Project 2001a. High Capacity Transit Modal Evaluation. Seattle, Washington.

Trans-Lake Washington Project 2001b. Multi-Modal Alternatives Evaluation – Environmental Findings. Seattle, Washington.

Trans-Lake Washington Project 2001c. Lake Crossing Concepts. Seattle, Washington.

Trans-Lake Washington Project 2002a. Transportation Demand Management Element Definition and Evaluation Report. Seattle, Washington.

Trans-Lake Washington Project 2002b. Meeting Summary – Executive Committee – January 30, 2002. Seattle, Washington.

Trans-Lake Washington Project 2002c. Interchange Selection Report. Seattle, Washington.

Trans-Lake Washington Project 2002d. Final Local Traffic Results Report. Seattle, Washington.

Trans-Lake Washington Project 2002e. Lidding Options and Opportunities Evaluation Report. Seattle, Washington.

Trans-Lake Washington Project 2002f. Final Freeway Traffic Operations Report. Seattle, Washington.

Trans-Lake Washington Project 2002g. Description of Alternatives to be Evaluated in the Trans-Lake Washington Project Draft EIS. Seattle, Washington.

Trans-Lake Washington Study Committee 1998. Working Draft Problem Statement. Seattle, Washington.

Trans-Lake Washington Study Committee 1999a. Findings and Recommendations of the Trans-Lake Washington Study Committee. Seattle, Washington.

Trans-Lake Washington Study Committee 1999b. Overview and Recommendations. Seattle, Washington.

WSDOT 2002a. Lidding Options and Opportunities Evaluation Report. Washington State Department of Transportation, Olympia, Washington.

WSDOT 2002b. Transportation Demand Management Element Definition and Evaluation Report. Washington State Department of Transportation, Olympia, Washington.

WSDOT 2002c. Signatory Agency Committee (SAC) Agreement. Seattle, Washington. Washington State Department of Transportation, Olympia, Washington.

WSDOT 2003. 2003 Update: WSDOT Cost Estimate Validation Process. Seattle, Washington. Washington State Department of Transportation, Olympia, Washington.

WSDOT 2006a. SR 520 Bridge Replacement and HOV Project Draft Environmental Impact Statement. August 2006. Washington State Department of Transportation, Olympia, Washington.

WSDOT 2006b. SR 520 Bridge Replacement and HOV Project Draft Public Comment Report. December 2006. Washington State Department of Transportation, Olympia, Washington.

WSDOT 2009. I-5 to Medina: SR 520 Bridge Replacement and HOV Project Supplemental Draft Environmental Impact Statement. Washington State Department of Transportation, Olympia, Washington.

WSDOT and Sound Transit 2002. Accommodating High Capacity Transit in the SR 520 Corridor. Seattle, Washington.

GIS References

King County 2005. Stream and River GIS Data. King County Standard GIS Data CD. http://www.kingcounty.gov/operations/GIS.aspx. King County GIS Data Center, Seattle, WA. Accessed in October 2008.

King County 2006. Aerial Photo GIS Data, original source NAIP USDA Imagery (USDA-FSA Aerial Photography Field Office). http://rocky2.ess.washington.edu/data/raster/naip/King/index.html. King County, GIS Center, Seattle, WA. Accessed October 2006.

CH2M HILL (2008) GIS Data (Park and Trails) include the following datasets:

City of Bellevue 2005. Parks GIS Data, City of Bellevue Parks Property. City of Bellevue Standard GIS Data CD/July 2007. http://www.ci.bellevue.wa.us/mapping_request_form.htm. Information Technology Center, Bellevue WA. Accessed on July 24, 2007.

City of Kirkland 2001. Parks GIS Data. City of Kirkland Custom GIS Data CD. http://www.ci.kirkland.wa.us/depart/Information_Technology/GIS/GIS_maps.htm. City of Kirkland GIS Department, Kirkland WA. Accessed on September 10, 2008.

City of Seattle 1994. Bike Pedestrian Trail GIS Data, Bike Class Look-up Table. Custom GIS CD/ August 2007. http://www.cityofseattle.net/GIS/docs/datacds.htm. City of Seattle SPU/GIS Product and Services Unit, Seattle WA. Accessed on May 15, 2008.

City of Seattle 2005. Parks GIS Data. City of Seattle Standard GIS Data CD#3. http://www.cityofSeattle.net/GIS/docs/datacds.htm. City of Seattle SPU/GIS Product and Services Unit, Seattle WA. April 10, 2007

King County 2006. Parks GIS Data. King County Standard GIS CD. http://www.kingcounty.gov/operations/GIS.aspx. King County GIS Center, Seattle, WA. Accessed in October 2008.

SDOT and SPU 2008. Seattle Bicycle Map, Bike Pedestrian Trail GIS Data-Seattle Bicycling Guide Map. http://www.seattle.gov/transportation/bikemaps.htm. Seattle Department of Transportation and Seattle Public Utilities GIS Products, Seattle, WA. Accessed in March 2008.

Seattle Parks and Recreation 2009. Parks GIS Data. Seattle Parks and Recreation Data Request. Seattle Parks and Recreation and City of Seattle SPU/GIS Product and Services Unit, Seattle, WA. Accessed on February 25, 2009.

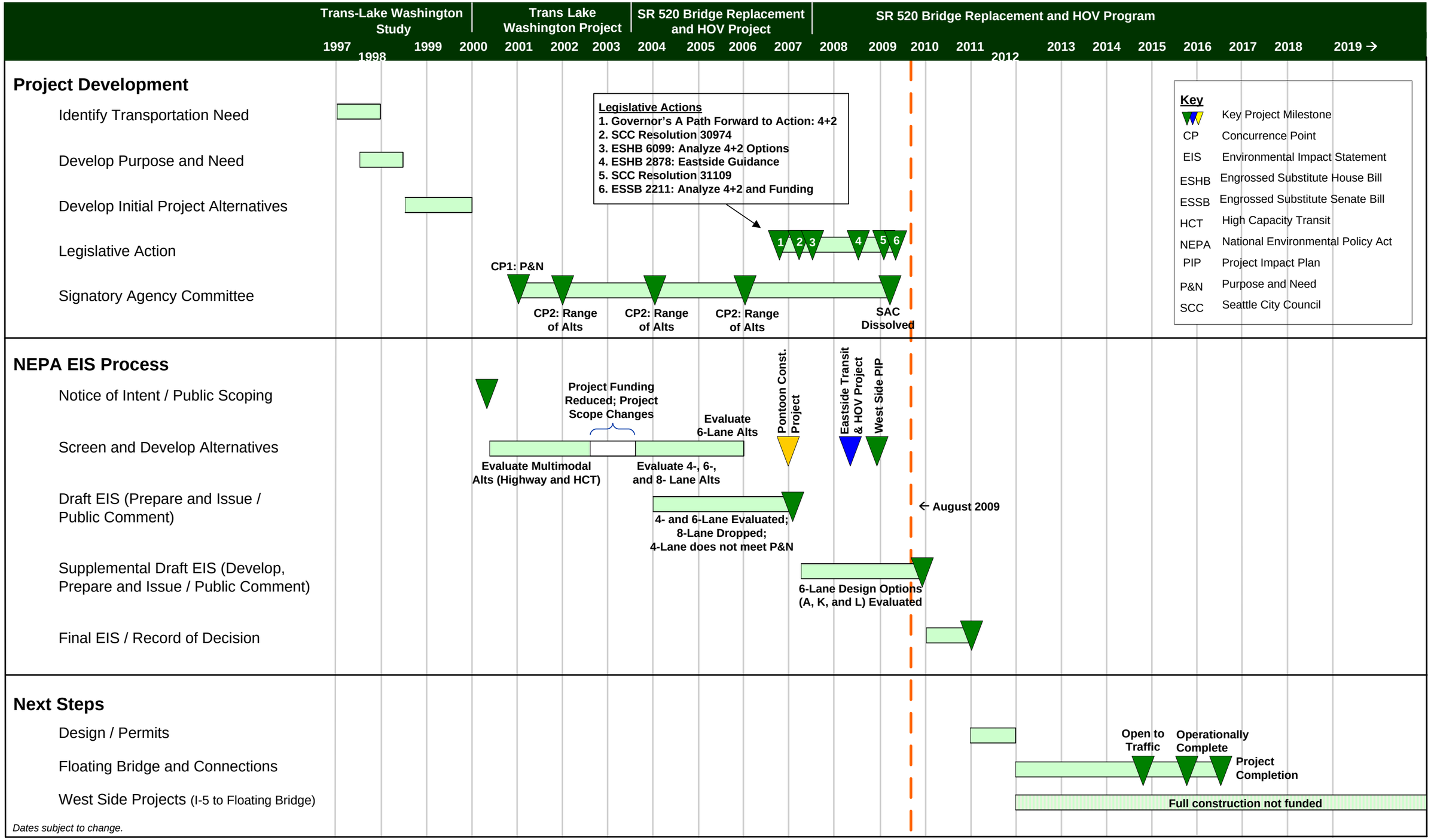
Attachment 1

Project Development Process – August 2009

Washington State Department of Transportation

SR 520 Bridge Replacement and HOV Program

Project Development Process – August 2009



Attachment 2

History of NEPA Process and Alternatives

History of NEPA Process and Alternatives

		Project phase				
		Trans-Lake Washington Project (1998—1999)	EIS Initiation and Alternatives Screening	Draft EIS (Released August 2006)	Supplemental Draft EIS (Targeted release: December 2009)	Final EIS (Targeted release: early 2011)
NEPA / Project Element	Goal / Purpose and Need	Address traffic congestion across and around Lake Washington.	To improve mobility for people and goods across Lake Washington within the SR 520 corridor from Seattle to Redmond in a manner that would be safe, reliable, and cost-effective, while avoiding, minimizing and/or mitigating impacts on affected neighborhoods.			
NEPA / Project Element	Screening	Study committee identified and evaluated potential solutions.	Two levels of screening criteria developed from Purpose and Need and applied to Trans-Lake alternatives.	Screened design options proposed by community members.	Not yet screened using existing criteria.	Will be screened with original screening criteria after SDEIS is released.
NEPA / Project Element	Alternatives	Seven "solution sets" representing different mixes of roadway, transit, transportation demand management and transportation systems management solutions developed.	Project corridor alternatives evaluated: • No Build. • 4-Lane. • 6-Lane. • 8-Lane.	Project corridor alternatives evaluated: • No Build. • 4-Lane. • 6-Lane. • 8-Lane (described rationale for dropping). • Eastside options.	DEIS 6-Lane base and 6-Lane design options dropped from further analysis. SDEIS evaluating: • No Build. • 4-Lane (traffic analysis only). • 6-Lane.	Will evaluate / update preferred alternative.
NEPA / Project Element	6-Lane Design Options	N/A	N/A	Evaluated: • Pacific Street Interchange (PSI). • Second Montlake Bridge. • No Montlake Freeway Transit Stop.	Evaluating: • Option A: 2nd Montlake drawbridge. • Option K: Tunnel under the Montlake Cut; lowered single point urban interchange (SPUI). • Option L: Diagonal drawbridge over the Montlake Cut; surface SPUI.	Will evaluate preferred design option.
Process	Activities	1 Identified and evaluated potential solutions: • New corridors. • New modes (ferry, high-capacity transit). • Increased capacity on existing corridors. • Crossing methods (tubes, tunnels). • Demand management.	3 • Established project committees (Executive, Technical, Advisory). • Developed Purpose and Need statement based on Trans-Lake findings.	5 • Conducted coordination and outreach with local jurisdictions, resource agencies, and the public. • Prepared and published DEIS incorporating evaluation of No Build, 4-Lane, and 6-Lane Alternatives and 6-Lane design options. • Seattle City Council Resolution 30974 provides guidance on design elements and mitigation measures to be included in replacement alternative.	7 • Legislation (ESSB 6099) directed development of a 6-lane corridor interchange design for the Montlake area through a mediated community involvement process. • Seattle City Council Resolution 31109 comments on results of mediation and confirms City recommendations for corridor. • Mediation explored 12 design options but did not reach a consensus solution. 9 • Preparing discipline reports to evaluate the impacts of Options A, K, and L. • Conducting coordination and outreach with agencies and the public. • Participating in Legislative Workgroup, created by legislation (ESHB 2211) to develop recommendations on financing and design options for the SR 520 corridor.	11 Prepare final evaluation of preferred alternative and design option.
Process	Recommendations and outcomes	2 Move forward with improvements to SR 520. Prepare EIS to evaluate the following alternatives: • No Build. • 4-Lane. • 6-Lane (with and without HCT). • 8-Lane (with and without HCT).	4 • Evaluate No Build, 4-Lane, and 6-Lane Alternatives in DEIS. • Defer HCT on SR 520 in near term, but provide long-term compatibility.	6 • Traffic modeling identified 6-Lane Alternative as better meeting purpose and need; 4-Lane does not meet mobility portion; 6-Lane Alternative improves mobility overall. • PSI option provides best local mobility in Seattle, but increases impacts to wetlands, aquatic habitat, and parks compared to 6-Lane base. • Gov. Gregoire identified 6-Lane Alternative as "best serving needs of regional transportation system."	8 • Mediation participants agreed on three options to carry forward: A, K, and L. • WSDOT is evaluating these in the SDEIS. Controversy re: interchange options 10 Preferred alternative and findings on Options A, K, L.	12 Record of decision.