SR 520 Variable Tolling Project

Environmental Assessment

March 2009

U.S. Department of Transportation
Federal Highway Administration

Washington State Department of Transportation

SR 520 Variable Tolling Project

King County, Washington

Environmental Assessment

Submitted Pursuant To:
National Environmental Policy Act (Section 42 U.S. Code 4332 (2)(c) and 23 CFR Part 771)
State Environmental Policy Act (Chapter 43.21C, Revised Code of Washington)

Submitted By:
U.S. Department of Transportation, Federal Highway Administration, Washington Division, and the Washington State Department of Transportation

Pete Jilek, P.E.
Federal Highway Administration
Urban Area Engineer

3/31/2009
Date of Approval

Megan White, P.E.
Washington State Department of Transportation
Director, Environmental Services

3/30/09
Date of Approval

The following persons may be contacted for additional information concerning this document:

Pete Jilek, P.E.
Urban Area Engineer
Federal Highway Administration
711 South Capitol Way, Suite 501
Olympia, WA 98501
(360) 753-9550

Paul W. Krueger
SR 520 Variable Tolling Project
Environmental Manager
Washington State Department of Transportation
401 2nd Avenue S, Suite 300
Seattle, WA 98104
(206) 716-1135

In compliance with the National Environmental Policy Act (NEPA) and the State Environmental Policy Act (SEPA), this Environmental Assessment (EA) describes the environmental consequences of implementing a toll on all lanes of State Route (SR) 520 at the Evergreen Point Bridge across Lake Washington. This analysis concludes that the project will not have a significant effect on the environment.

Comments must be postmarked or received by May 11, 2009, and should be returned to:

Paul Krueger, SR 520 Variable Tolling Project Environmental Manager
Urban Corridors Office
Washington State Department of Transportation
401 2nd Avenue S, Suite 300
Seattle, WA 98104
or email SR520VariableTolling@wsdot.wa.gov

Information about how to obtain a copy of this document, as well as the date and location of the public hearing are found on the next page.

The Environmental Assessment is available for review at the Seattle Public Library and King County Library System libraries listed below.

Seattle Public Library

- Central Library
- Montlake Branch
- Northeast Branch
- Queen Anne Branch
- University Branch

King County Library System

- Bellevue Regional Library
- Bothell Regional Library
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Printed copies of this document may be purchased for $14.60, which does not exceed the cost of reproduction. This document is also available online at: http://www.wsdot.wa.gov/Projects/LkWaMgt/

Two public hearings on this Environmental Assessment will be held. The first will be on Tuesday, April 28, 2009, from 5:30 p.m. to 7:00 p.m. at:

Bellevue Regional Library

1111 110th Ave. NE

Bellevue, WA 98004

The second public hearing will be held on Thursday, April 30, 2009, from 4:00 p.m. to 7:00 p.m. at:

Seattle Library/University Branch

5009 Roosevelt Way N.E.

Seattle, WA 98105

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National Environmental Policy Act Section (42 U.S. Code 4332 (2)(c) and 23 CFR Part 771) and State Environmental Policy Act (Chapter 43.21C, Revised Code of Washington)

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Abstract:

The U.S. Department of Transportation (USDOT) initiated a program, *National Strategy to Reduce Congestion on America's Transportation Network*, for federal, state, and local officials to consider as they work together to reverse current trends of congestion. The Urban Partnership Program is a major component of this initiative. The selected applicants will adopt the Four "Ts": tolling, transit, telecommuting and technology. These strategies have been found to effectively reduce traffic congestion. In 2007, Seattle was selected to join the Urban Partnership Program. This SR 520 Variable Tolling Project is included in the Lake Washington Urban Partnership Agreement (UPA).

State Route (SR) 520 is one of the main transportation corridors to cross Lake Washington. It connects Seattle with major population and employment centers on the Eastside. Congestion is a problem along the SR 520 corridor and will continue to worsen unless strategies are implemented to reduce it. Therefore, this Environmental Assessment (EA), in compliance with the National Environmental Policy Act (NEPA) and the State Environmental Policy Act (SEPA), describes the environmental consequences of implementing tolling along SR 520.

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A Federal agency may publish a notice in the Federal Register, pursuant to 23 USC §139(I), indicating that one or more Federal agencies have taken final action on permits, licenses, or approvals for a transportation project. If such notice is published, claims seeking judicial review of those Federal actions will be barred unless such claims are filed within 180 days after the date of publication of the notice, or within such shorter time period as is specified in the Federal laws pursuant to which judicial review of the Federal agency action is allowed. If no notice is published, then the periods of time that otherwise are provided by the Federal laws governing such claims will apply.

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LIST OF EXHIBITS

Acronyms

ATM	active traffic management
B5	five percent biodiesel
B10	10 percent biodiesel
B20	20 percent biodiesel
BMPs	best management practices
CAA	Clean Air Act of 1970
CEQ	Council of Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
CSC	Customer Service Center
dBA	decibel (A-weighted)
EA	Environmental Assessment
EBT	Electronic Benefit Transfer
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ETC	electronic toll collection
FAZ	forecast analysis zone
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
GHGs	greenhouse gases
HAC	high-accident corridors
HAL	high-accident locations
HSS	highway of statewide significance
HOV	high-occupancy vehicle
HOT	high occupancy toll
I	Interstate

Acronyms

mph	miles per hour
MSATs	Mobile Source Air Toxics
NAAQS	national ambient air quality standards
NAC	Noise Abatement Criteria
NCES	National Center for Education Statistics
NEPA	National Environmental Policy Act
NO2	Nitrogen Dioxide
NRHP	National Register of Historic Places
O3	Ozone
PAL	pedestrian accident locations
PM	Particulate Matter
PSCAA	Puget Sound Clean Air Agency
PSRC	Puget Sound Regional Council
SEPA	State Environmental Policy Act
SIP	State Implementation Plan
SO2	Sulfur Dioxide
SOV	single-occupancy vehicle
SR	State Route
TESC	temporary erosion and sediment control
UPA	Urban Partnership Agreement
USDOT	U.S. Department of Transportation
VMT	vehicle miles traveled
WAC	Washington Administrative Code
WSDOT	Washington State Department of Transportation

Chapter 1 Executive Summary

Chapter 1 summarizes the project background, the effects of the project, how this document is organized, and the next steps in the process.

What is the SR 520 Variable Tolling Project?

The SR 520 Variable Tolling Project will implement variable pricing (tolls) on all through-lanes of SR 520 between Interstate 5 (I-5) and Interstate 405 (I-405). All tolls will be collected electronically. The project will reduce traffic congestion and generate revenue. Revenue generated will be invested in the SR 520 corridor, subject to legislative appropriation, as required by state law (RCW 47.56.820).

Where is the SR 520 Variable Tolling Project located?

The study area for the SR 520 Variable Tolling Project is bounded by SR 522 to the north, I-405 to the east, I-90 to the south, and I-5 to the west. As shown in Exhibit 1-1, the project corridor itself is along SR 520, bounded by I-5 on the west and I-405 on the east. SR 520 is one of only two east-west roadways that cross Lake Washington. The other is I-90.

Exhibit 1-1
Project Corridor

Who is leading the project?

The Federal Highway Administration (FHWA) and the Washington State Department of Transportation (WSDOT) are joint lead agencies for this project. FHWA is the lead federal agency complying with the

National Environmental Policy Act (NEPA). WSDOT is the lead state agency complying with the State Environmental Policy Act (SEPA).

What are the benefits of the project?

Reduced Congestion: Variable pricing will encourage drivers to choose alternate routes, times, and travel modes, or to eliminate trips altogether. This will result in reduced congestion, providing a more reliable trip for users of SR 520 as described in the *Transportation Discipline Report* in Appendix E.

Funding Improvements: Revenue generated will be invested in the SR 520 corridor, subject to legislative appropriation. The toll revenue could be used for replacing bridges, adding HOV lanes, and other types of transportation improvements.

How will the project affect the future environment?

The SR 520 Variable Tolling Project is an interim project that will be built and operated only until the existing Evergreen Point Bridge is replaced by a new bridge. The new bridge will have a different configuration and likely have different toll rates, so the conditions we analyzed for this document will no longer exist after the new bridge opens. WSDOT plans to open the replacement of the Evergreen Point Bridge in 2016. Therefore, we used 2016 as the horizon year for our analysis of how the project would affect the environment in the future. Our analysis does not extend beyond 2016.

Transportation: SR 520 connects Seattle on the west side of Lake Washington with Medina, Hunts Point, Yarrow Point, Clyde Hill, Kirkland, Bellevue, and Redmond on the east side of the lake. It serves as a critical connection for people and goods crossing Lake Washington.

The primary transportation effects of the tolling project are:

- Congestion relief on SR 520 in peak periods.
- Less traffic in general on all cross-lake routes during peak periods.

Peak period traffic volumes will be 11 percent to 18 percent lower on SR 520 after a toll is implemented than if a toll is not implemented. However, with a toll on SR 520, volumes on I-90 and SR 522 would increase only zero percent to four percent and volumes on I-405 and I-5 would not noticeably change.

The tolling project will result in minimal to no noticeable diversion of traffic to SR 522, I-90, I-405, and I-5 during peak periods because many people will be making other choices. They will change the time-of-day for their trip, use transit instead of driving, or choose a different destination that doesn't require crossing Lake Washington.

As a result of the changes in traffic volumes, we expect to see higher average travel speeds, lower travel times, and reduced vehicle miles traveled on SR 520 during peak periods and minimal changes on alternate routes.

Social Resources: The project will reduce traffic congestion during peak hours, thus improving travel reliability and reducing travel times. Increased mobility and reliability will benefit emergency service providers, and community cohesion will not be affected as a result of the project. There will be no effect on any park or recreation resource.

Environmental Justice: There are three principal ways in which project operation will adversely affect low-income or minority populations if not mitigated:

- The cost of the tolls will present a burden to low-income bridge users.

- The cost of the tolls will present a burden to social service agencies that depend on the Evergreen Point Bridge to serve their low-income or minority clients.
- Bridge users will be required to purchase a transponder and set up an account with the Washington State Department of Transportation (WSDOT) to pay the toll, which may present a burden to low-income Evergreen Point Bridge users who are less likely than the general population to have a credit or debit card.

If the SR 520 Variable Tolling Project is undertaken, WSDOT and its partners have already decided to employ the following strategies to help minimize adverse effects on low-income or minority populations:

1. WSDOT will establish permanent customer service center storefronts on both sides of Lake Washington.
2. WSDOT is exploring the possibility of establishing permanent *Good To Go!*™ retail outlets at convenient locations, such as grocery stores, convenience stores, or pharmacies throughout the travelshed.
3. Low-income users will be able to establish and replenish their prepaid accounts using their Electronic Benefit Transfer (EBT) card. An EBT card functions like a debit card and allows recipients who receive federal benefits to pay for products and services, such as groceries and health care.
4. WSDOT will conduct outreach in multiple languages to provide information about how to purchase a transponder, establish an account, and use the system.
5. WSDOT will provide social service agencies with information about tolling and options to avoid the tolls.

The above strategies will minimize barriers that otherwise would limit access to the SR 520 by low-

income populations. In addition, the following strategies could also be considered by the Washington State Legislature to further minimize adverse effects:

1. Allocating additional funding to increase transit service along SR 520 routes that are used by low-income populations.
2. Allocating funding to provide refunds to social service agencies that broker transportation for low-income and disabled populations that meet certain thresholds.

Economic Resources: The project will have little economic effect overall and no direct effects to businesses. Businesses located near the Evergreen Point Bridge are not expected to see any noticeable change in revenues as a result of the project.

Water Resources: The project will have minimal construction disturbance and will add a very small amount of impervious surface for mounting equipment cabinets. WSDOT will adhere to all existing state and federal laws pertaining to water quality by ensuring that the contractor implements best management practices (BMPs). As a result the project will have no perceptible or appreciable effect on water quality.

Geology and Soils: Because this project will have very minimal construction disturbance, geology and soils are not discussed in detail within this document. Potential effects related to soil erosion are described in the water resources section.

Ecosystems: The project will have no permanent effects to the natural environment. WSDOT will ensure that the contractor implements erosion control BMPs and timing restrictions to minimize temporary effects from soil disturbance and construction noise.

Visual: The project will cause very little change to visual resources in the project area. To minimize visual effects,

we will place the tolling equipment either on the existing truss structure or on a new gantry structure as close to the truss structure as possible. Structural elements will be painted the same color as the truss structure. The additional lighting at the tolling location will be designed to have negligible effect on existing ambient light levels and glare.

Example of gantry structure that could be used on the Evergreen Point Bridge

Cultural Resources: The Evergreen Point Bridge was completed and placed in service in 1963. It is eligible for listing on the National Register of Historic Places (NRHP). We determined that installing of the tolling equipment on the east highrise truss structure will have no adverse effect on the NRHP-eligible Evergreen Point Bridge.

Public Utilities: The project will not have an adverse effect on utilities. Some electricity will be required to operate the tolling equipment; however, the amount needed will be negligible.

Land Use: The duration of this project is too short to result in long-term land use changes.

Hazardous Materials: We do not anticipate any hazardous materials effects. The project will be constructed completely within WSDOT right-of-way and will be remote from any potential hazardous materials site.

Energy: We expect the project to improve traffic flow, reduce peak period traffic congestion along SR 520, and allow more cars to travel at more energy-efficient speeds. In addition, because little construction is involved with the SR 520 Variable Tolling Project, little energy will be spent in reducing congestion along the route. Overall, the project will reduce energy use compared to the amount of energy that would be used if the project was not implemented.

Noise: The project will not noticeably change noise levels on SR 520 or alternate routes. While peak period traffic

volumes on SR 520 would be lower, the reduction would not be enough to result in a perceptible difference in noise levels compared to existing noise levels. Similarly, the minimal diversion of traffic from SR 520 on to alternate routes (I-90, SR 522, I-405, and I-5) will not result in a substantial difference in future noise levels compared to existing noise levels. Construction activities will temporarily increase noise levels. Recommended construction noise mitigation measures are included in Chapter 5.

Air Quality: The project will not have an adverse effect on air pollutant emissions. Construction activities will temporarily generate air pollutants within the project area. BMPs to control air pollutants during construction are described in Chapter 5.

Cumulative Effects: In conjunction with other transportation and development projects planned in or near the project area, the SR 520 Variable Tolling Project could contribute to cumulative effects on transportation, Environmental Justice (low-income) populations, air quality, and climate change (greenhouse gas emissions).

A number of highway construction projects are planned on SR 520 and alternate routes between 2010 and 2016. The SR 520 Variable Tolling Project will not have any noticeable cumulative effect on travel patterns in combination with the construction of these projects. Existing capacity constraints on the highway system and planned construction on both of the direct routes across Lake Washington will limit diversion related to construction.

The SR 520 Variable Tolling Project, along with other planned highway and transit improvements, will cumulatively improve regional mobility. Transit users crossing Lake Washington will especially see benefits. They will experience a noticeable cumulative improvement as HOV lane projects are completed on both SR 520 and I-90, along with transit service increases by both King County Metro and Sound Transit. The use of transit use across Lake

What major transportation projects are planned for construction in the study area between 2010 and 2016?

SR 520
SR 520 Eastside Transit and HOV Project (2010-2013)

SR 520 Bridge Replacement and HOV Project (2012-2016)

I-90
I-90 Two-Way Transit and HOV Operations Project (2010-2014)

Sound Transit East Link Light Rail Project (2013-2020)

I-405
I-405 NE 195th to SR 527 Northbound Widening Project (2009-2010)

I-405 NE 8th Street to SR 520 Improvement Project (2009-2012)

Washington will also likely see a cumulative increase as more trips are added and people look for ways to avoid the toll on SR 520.

Construction planned for the un-tolled routes around or across Lake Washington may make it more time-consuming for low-income SR 520 users to take an alternate route to avoid paying the toll. A potential positive cumulative effect is the transit service improvements described above will make it easier for some low-income users to use transit to avoid the toll on SR 520.

This project, with other transportation projects planned to be completed between 2010 and 2016, will provide some cumulative reduction in congestion. This will likely reduce the amount of emissions emitted from autos. However, even if these projects are not built, vehicle emissions are likely to be lower in 2016 than present levels due to EPA programs to reduce emissions by 2020. Overall, we expect there will be little cumulative effect on regional air quality as a result of this project.

The project will contribute to the cumulative reduction of greenhouse gas emissions, along with other regional projects that reduce single-occupancy vehicle use and improve traffic flow. Quantitative modeling tools to evaluate greenhouse gas emissions for linear transportation projects are limited at this time. At the project level, WSDOT is currently unable to show the effect of improved traffic flow on emissions. However, since about half of the State of Washington's greenhouse gas emissions are from transportation (automobiles and trucks), reducing single-occupancy vehicle trips likely reduces greenhouse gases.

How is this Environmental Assessment organized?

This environmental assessment presents information about the project to inform the public about the potential effects of project choices and assist decision-makers in considering how the project should be accomplished.

Chapter 2 provides a background and discusses the purpose for the project. Chapter 3 describes the development of the alternatives, explains how the Preferred Alternative was chosen, and summarizes public involvement. Chapter 4 gives a project description and describes the construction of the project. Chapter 5 includes a summary of the affected environment, potential effects, and proposed mitigation measures to avoid or minimize effects, if necessary. Chapter 6 describes the cumulative effects of the project. Chapter 7 is a list of preparers of the document and Chapter 8 is a list of references. Additional information has been provided within the appendices. The appendices include agency and public correspondence, a list of commitments, and other technical reports.

What are the next steps in this process?

Once this EA is published, a 30-day public and agency comment period will begin, during which a public hearing will be held.

After the 30-day public comment period has ended, we anticipate that FHWA will complete the NEPA process by issuing a Finding of No Significant Impact (FONSI). FHWA will consider the analysis of environmental effects in this document and public comments when they decide if a FONSI is appropriate. WSDOT plans to complete the SEPA process by using this EA as the documentation for a SEPA Determination of Non-significance.

In addition to completing the NEPA and SEPA processes, the Washington State Legislature will need to authorize

What is the Environmental Assessment Process?

The SR 520 Project

Technical Analysis
The technical analysis for the environmental resources, including two discipline reports and two technical memos, studies existing conditions, the proposed actions, and how effects to environmental resources will be avoided, minimized, or mitigated.

Environmental Assessment (EA)
The draft EA, prepared in compliance with the National/State Environmental Policy Act, discusses the purpose and need for the project, summarizes development of the alternatives, and includes an analysis of effects to determine if an Environmental Impact Statement (EIS) or Finding of No Significant Impact (FONSI) would be required.

FONSI or EIS
The FONSI is prepared only when the Preferred Alternative has no significant effect on the environment, and therefore, an EIS is not required. If any significant effect is discovered, an EIS would then need to be prepared and a FONSI would not be issued.

tolling SR 520 before final design and construction can proceed. In order to implement tolling in 2010, this will need to occur during the 2009 legislative session. The Washington State House of Representatives is currently considering two bills that would authorize tolling on the SR 520 corridor (HB 2211 and HB 2319).

Our proposed construction schedule includes several elements. The first is to develop documents that request proposals from companies to build the project. We plan to complete this in early to mid-2009. Next, we expect to give the notice to proceed for construction in mid- to late 2009. The project should be complete and opened in mid- to late 2010.

Chapter 2 Introduction to the Project

Chapter 2 explains the project background, the purpose and need for the project, and how this project relates to other projects in the SR 520 corridor.

How did the SR 520 Variable Tolling Project come about?

In May 2006, the USDOT announced a major nationwide initiative to reduce transportation system congestion. The plan, called the *National Strategy to Reduce Congestion on America's Transportation Network*, provides a blueprint for federal, state, and local officials to consider as they work together to reverse the current trends of congestion. One major component of this initiative is the Urban Partnership Program. The USDOT solicited applicants that, if selected, would adopt the "Four Ts": tolling, transit, telecommuting and technology—strategies believed to be effective on a combined basis in reducing traffic congestion. In return, the USDOT will provide federal funding to the selected Urban Partners to support implementation.

In 2007, the Seattle area was selected to join the Urban Partnership program. The Lake Washington Urban Partnership Agreement (UPA) is an agreement between the USDOT and the Seattle-area Urban Partners: WSDOT, King County, and the Puget Sound Regional Council (PSRC). Variable tolling on SR 520 is just one component of the Lake Washington Urban Partnership Agreement (UPA). Other components include transit improvements, new technologies such as real-time traveler information systems and active

What are the other elements of the Lake Washington Urban Partnership?

The Lake Washington Urban Partnership includes three elements in addition to tolling. Together these four elements will be implemented to help reduce congestion along the SR 520 corridor and will meet the terms of the Urban Partnership Agreement. Detailed information can be found on the Web at www.upa.dot.gov/agreements/seattle.htm. The three additional elements include:

1) Transit

King County Metro will improve transit service on SR 520 by expanding park-and-rides, adding at least 45 new buses, increasing service hours, and increasing rider information services.

2) Technology

WSDOT will implement European-style active traffic management (ATM) techniques on SR 520 and I-90 to improve traffic flow and safety. These techniques involve the use of dynamic message signs suspended over each lane every half-mile to provide variable speed and lane control information to drivers, while queue warning information and other messages will be provided via variable message signs.

3) Telecommuting

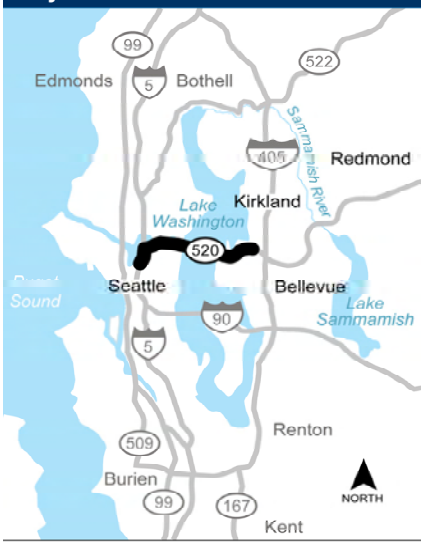
PSRC will develop programs to encourage telecommuting and the use of other transportation demand management tools. PSRC will work with employers to encourage flexible employment arrangements that improve worker productivity and reduce rush-hour traffic demands.

traffic management (ATM), and increasing telecommuting programs. These components are being implemented separately from variable tolling, with separate environmental reviews.

What is the purpose of the project?

The purpose of the Urban Partnership SR 520 Variable Tolling Project is to reduce congestion on SR 520 between I-5 and I-405 by implementing tolling, meet the requirements of the UPA, and raise revenue for future transportation improvements on SR 520.

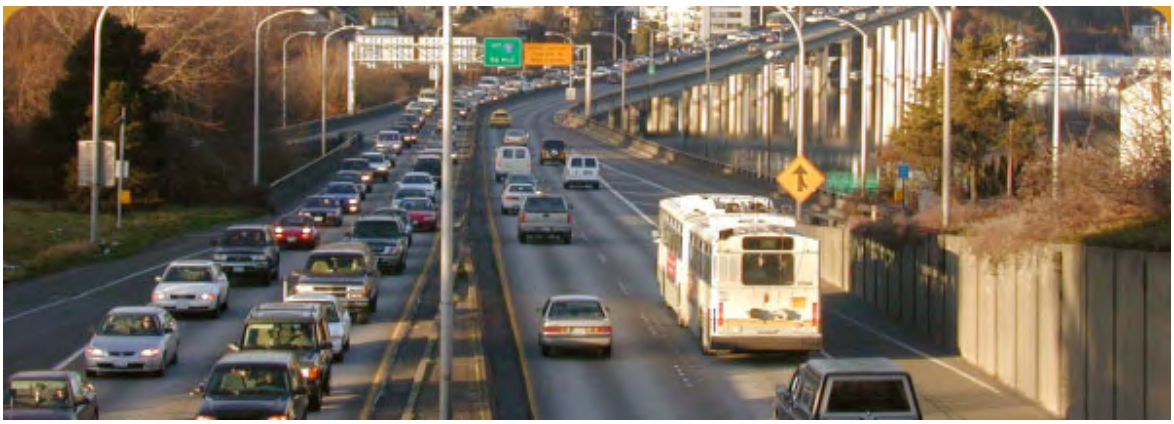
Exhibit 2-1
Project Corridor



Why is this project needed now?

The movement of people and goods needs to be improved on this important corridor.

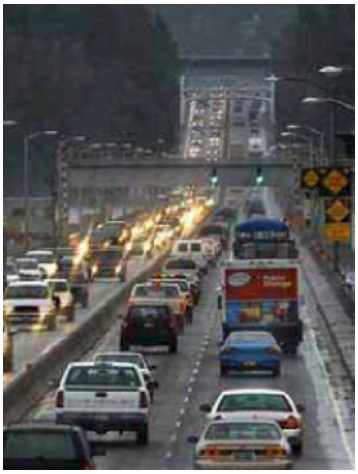
SR 520 is a regionally important transportation corridor, connecting major employment and population centers with one of the only two bridges across Lake Washington (see Exhibit 2-1). Successful implementation of regional land use plans requires the ability to efficiently and reliably move an increasing volume of people and goods across the lake.



Traffic congestion on SR 520

Traffic congestion makes travel unreliable.

This project needs to be implemented now because of the severe traffic congestion on SR 520. Population and employment growth in the central Puget Sound region has led to an increased demand for travel that exceeds the highway's capacity. This means that more drivers want to use the highway than it can accommodate. The result is a long backup of vehicles traveling at very slow speeds—a scenario that many people traveling during rush hour have experienced. Details of the traffic congestion analysis can be found in the *Transportation Discipline Report* in Appendix E.



Existing peak traffic on SR 520

The project must meet the requirements of the Lake Washington Urban Partnership Agreement.

USDOT will only provide funding for the projects that are part of the Lake Washington Urban Partnership Agreement if the Seattle-area Urban Partners meet the requirements of the agreement. Implementing a variable toll on SR 520 is one of the requirements. The agreement also requires the toll be implemented on an accelerated schedule.

How does this project relate to other SR 520 projects?

The SR 520 Variable Tolling Project is one of four projects that compose the SR 520 Bridge Replacement and HOV Program. Of those projects, three of them are physically located in the SR 520 project area. There is a fourth project, the Pontoon Construction Project, which will be located outside the project area. Exhibit 2-2 shows a brief summary of the four projects.

Exhibit 2-2
Summary of SR 520 Projects

The SR 520 Bridge Replacement and HOV Program will replace the Portage Bay and Evergreen Point bridges and improve existing roadway between I-5 in Seattle andSR 202 on the Eastside.

The SR 520 Bridge Replacement and HOV Program includes four projects:

- **Urban Partnership** – Traffic management and tolling from I-5 to I-405.
- **Eastside Transit and HOV** – Evergreen Point Road to SR 202.
- **Pontoon Construction Project** – Pontoons for catastrophic failure planning.
- **Bridge Replacement and HOV Project** – I-5 to the vicinity of Evergreen Point Road.

SR 520 Bridge Replacement and HOV Project

This project would improve the SR 520 corridor from I-5 in Seattle to the vicinity of Evergreen Point Road. It would include replacement of all the existing bridges with newer, safer bridges designed to better withstand earthquakes and windstorms. The project is currently being reviewed in a NEPA/SEPA EIS process and is planned to be open in 2016. Both the new roadway configuration and the toll rates would be different from what is being studied for the SR 520 Variable Tolling Project.

SR 520 Eastside Transit and HOV Project

The SR 520 Eastside Transit and HOV Project will enhance travel time reliability, mobility, access and safety, for transit and HOVs in rapidly growing areas along the SR 520 corridor east of Lake Washington.

The project will improve and complete the HOV lanes on the 8.5 miles of SR 520 from the Evergreen Point Transit Station near Lake Washington to SR 202 in Redmond. The HOV lanes and transit stops will be shifted from the outside to the inside of the roadway. This work will include reconstructing the approximately three-mile section of SR 520 between the Evergreen Point Transit Station and 108th Avenue NE. WSDOT is currently preparing a NEPA Environmental Assessment for the project. The project is scheduled to be complete in 2013.

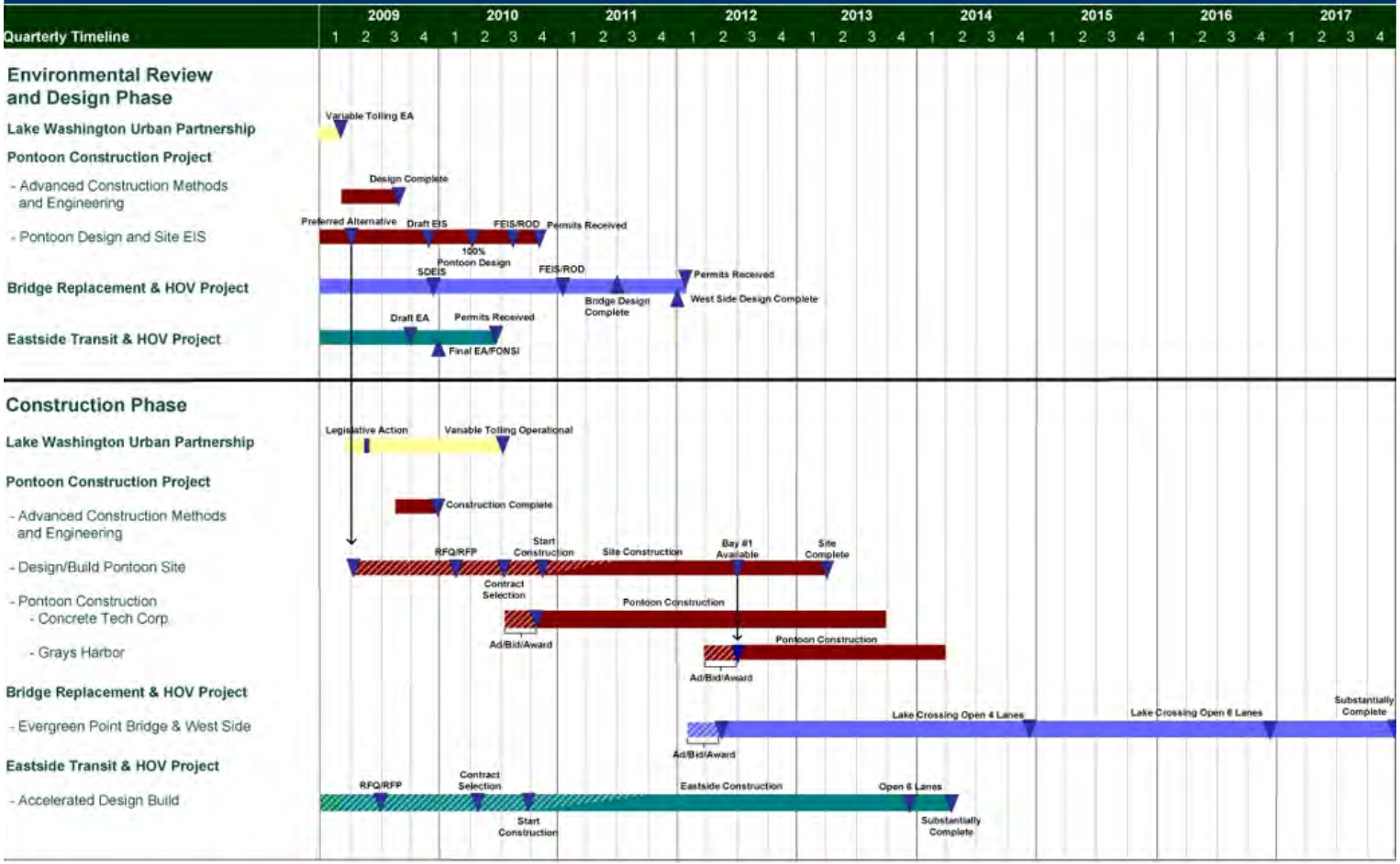
SR 520 Pontoon Construction Project

This project will advance pontoon construction so the SR 520 floating bridge can be restored in the event of a catastrophic failure. The project also includes storing these pontoons until they are needed. WSDOT is currently evaluating two potential sites – one in Aberdeen and one in Hoquiam– for construction of a new casting basin facility. An existing site in Tacoma would also be used to construct some of the pontoons. WSDOT is currently preparing a NEPA/SEPA EIS for the project. Construction of the new facility would start by the end of 2010 to enable pontoon construction to start in 2012.

Related to this project is a separate project called Advance Construction Methods and Engineering that would test proposed construction methods before construction of the new facility starts.

See Exhibit 2-3 for the current program schedule for the projects in the SR 520 program.

Exhibit 2-3
Program Schedule for the SR 520 Projects



Chapter 3 Developing the Alternatives

Chapter 3 explains the development and screening of project alternatives, how the Preferred Alternative was chosen, and the public and agency involvement that was conducted.

Evergreen Point Bridge—Existing Structure

What factors affected the development of alternatives?

The range of alternatives that we considered was greatly narrowed by the need to satisfy the UPA requirements and the short timeframe of the project.

WSDOT plans to replace the existing Evergreen Point Bridge in 2016. This project is an interim project that will be built and operated only until the new bridge opens. Alternatives that take several years to plan, design, and construct would not operate long enough to justify implementing. Therefore, we did not consider any alternative that expanded or changed the configuration of SR 520 between I-5 and I-405.

The SR 520 Bridge Replacement and HOV Project, which will replace the existing bridge, and the SR 520 Eastside

Open vs. Closed Tolling Systems

Two common tolling methods are used, open and closed systems.

Open System
In the open system, there are toll facilities (such as a toll booth or electronic toll point) along the main-line toll road. Drivers pay a toll at each facility they encounter.

Closed System
In a closed system, typically used with ticketed toll facilities, the driver stops and receives a ticket stamped with the location of the entrance to the toll facility. The driver stops again upon exiting the facility and pays the toll, which is based on the point of entry and point of exit along the facility route.

Transit and HOV Project, are considering alternatives that will expand or change the configuration of SR 520 in this area. Environmental review for these projects is taking place concurrently with the SR 520 Variable Tolling Project.

What alternatives were considered for the EA?

All of the alternatives we considered involved different ways to implement tolling in the SR 520 corridor. Details describing the various tolling alternatives considered can be found in the *Identification of Toll Configuration Alternatives* memo located in Appendix F.

In summary, we initially considered 10 tolling configuration alternatives for the SR 520 Variable Tolling Project. Variations among the alternatives included different locations for tolling, including various numbers of tolling points, and whether tolling collection equipment should be on the mainline or on off- and on-ramps. We also considered various toll pricing alternatives and discount options.

We used a screening process to identify one toll configuration and one pricing alternative to evaluate in this EA as the Preferred Alternative. In addition, we also evaluate a No Build Alternative in this EA.

What is the No Build Alternative?

The No Build Alternative establishes a baseline for comparing the effects associated with the proposed project. The No Build Alternative maintains the status quo meaning only routine activities, such as road maintenance, repair, and safety improvements, or other projects that are already planned and permitted, would take place. SR 520 across Lake Washington will remain as it is today, which consists of a four-lane highway (two lanes in each direction of travel) with no shoulders on the floating part of the bridge. The only difference between

What is Photo Tolling?

Photo tolling is a cutting-edge system of toll collection that uses high-definition cameras to record the license plates of vehicles that pass through a tolling point. The plate is then traced to the owner, who is billed.

Toll Collection Method

Three types of toll collection are used at modern toll facilities:

Manual, or staffed, toll facilities
Drivers pay the toll to an attendant who then raises a gate to permit the vehicle to pass.

Coin-basket facility
The coin-basket facility uses an unstaffed booth where drivers stop at the tollbooth and toss the exact change in coins into a basket. The machine determines whether the correct amount of toll has been paid and, if so, raises a gate to permit the vehicle to pass.

Electronic Toll Collection (ETC) systems
In the ETC system, drivers subscribe to a service and are given a transponder. Toll facilities are outfitted to detect the transponder and subtract the toll money from the driver's account when the vehicle passes the booth.

the No Build Alternative and the proposed project is the toll and the tolling equipment.

What screening criteria were used to evaluate the alternatives?

The screening criteria we used to evaluate each preliminary alternative were primarily based on the purpose and need of the project, which is described in Chapter 2 of this EA. The following screening criteria for evaluating various toll configurations and pricing alternatives related to the purpose and need were used:

- Will the alternative reduce congestion along SR 520?
- Will the alternative meet the implementation schedule?
- How will the alternative affect the complexity of processing transactions?
- How easily can the tolling and pricing be explained to the public?
- Will the alternative be accepted by the traveling public?
- What is the likely effect of the alternative on congestion in the I-90 corridor?
- What effect will the alternative have on improving safety in the corridor?
- What effect will the alternative have on improving roadway operations in the corridor?
- What is the effect of the alternative on generating potential toll revenue?

In addition to the specific criteria related to the purpose and need, the following additional screening criteria were also used:

- Will the alternative cause local diversion of traffic from the corridor?

Aerial view of the existing Evergreen Point Bridge looking west

- What is the relative ease of enforcing an HOV 3+ discount requirement for the alternative?
- Does the alternative facilitate a phased approach to implementing a new toll system?
- How easy would it be to enforce toll payment under the alternative?
- How much would the alternative cost to implement?
- What is the effect of the alternative on the environment?

Details about how each of these criteria was applied and the result of the screening can be found in the *Screening Criteria for Toll Configuration and Pricing Alternatives* memo located in Appendix F.

How was the Preferred Alternative chosen?

Toll configuration alternative

The screening criteria listed above were used to identify the Preferred Alternative that is now the proposed project. This process is described in detail in the *Qualitative Evaluation of Toll Configuration Alternatives* memo found in Appendix F.

Based on the results of the alternative screening, the alternative known as Alternative 1 was chosen as the Preferred Alternative for the SR 520 Variable Tolling Project. Alternative 1 will consist of a single, two-way tolling location with variable pricing. It will be a multi-lane, open system. Tolls will be collected by a method known as all electronic toll collection (ETC). This equipment will be mounted on the existing truss structure on the east side of the bridge, or on a separate gantry structures near the eastside of Lake Washington.

This alternative will:

- Reduce peak period congestion on SR 520 by implementing a tolling system.
- Meet the schedule of opening in mid-2010.
- Simplify the tolling operations by using only one tolling location.
- Be more readily accepted by the public since it will be simple and easy to use.
- Increase transit use by encouraging travelers to use transit instead of paying the toll.

We decided to place the tolling location on the eastern end of the bridge over Lake Washington so only people crossing the bridge pay the toll, which minimizes diversion to local streets.

We also considered other locations on land at either end of the bridge. Having the detection equipment and cameras on the bridge structure is preferable to a site located east or west of the bridge. There is little room on the land on the west side of the bridge to build the structures required to hold the equipment, and the area is more environmentally sensitive than the east side. The land on the east side of the bridge would not be preferable either because of the potential for conflicts with two other SR 520 projects (the Eastside Transit and HOV Project and the SR 520 Bridge Replacement and HOV Project). Both projects will include construction just east of the bridge that will likely include lane shifts and require the relocation of any tolling equipment placed over those lanes. If most of the equipment is on the existing bridge structure itself, it will not have to be disturbed until it is moved to its final location upon completion of the new bridge.

Variable pricing alternative

There are two types of variable pricing – static and dynamic. The main difference between the two is that static pricing has a set schedule of toll prices in advance of the trip, where dynamic pricing can change at any given time in response to changes in the amount of traffic.

Dynamic pricing works best when the decision to use the toll facility can be made close to where the toll will be applied. For SR 520, this decision would need to occur very far away from the corridor, such as south of I-90, or north of SR 522. Because of the distance required for notification, by the time a driver reaches SR 520, the toll could change dramatically. Also, static pricing does a better job of congestion reduction because a commuter will be able to make more informed decisions on their route. For example, commuters would know (while planning their trip from home or work) what tolls to expect at certain times of day. Static pricing should result in a more stable and reliable trip pattern for the corridor. Based on these reasons, we chose variable static pricing as the preferred pricing alternative.

One element of pricing that is still being studied on how to implement as part of the SR 520 Variable Tolling Project is discounted access for vehicles with 3+ occupants. We also considered other discount programs, such as resident discounts and low-emission vehicles discounts. We concluded that only the HOV discount program would help reduce traffic congestion by encouraging carpooling. However, since there is not a dedicated HOV lane at the tolling location, identifying HOV users is difficult. WSDOT has not yet found an effective method for identifying them and is working to resolve this issue. This issue does not substantially affect the traffic analysis or any other effects analysis completed for this EA.

For a detailed description of the screening of the pricing alternatives and the discount programs considered, see the *Identification and Evaluation of Pricing Alternatives* memo located in Appendix F.

How have the public, tribes, and agencies been involved?

Scoping Process

Scoping

NEPA regulations use the term "scoping" to refer to the process of defining the content (scope) of environmental documents and the range of alternatives that will be analyzed in the document. The scoping process is used to explain the project to agencies and the public and identify the major issues of concern to both regulatory agencies and local citizens.

The SR 520 Variable Tolling Project team conducted two public scoping meetings. The first was held on June 24, 2008, from 4:00 p.m. to 7:00 p.m. at the Naval Reserve Building, Lake Union Park, 860 Terry Ave. N in Seattle. The second meeting was held on June 25, 2008 from, 4:00 p.m. to 7:00 p.m. at Bellevue City Hall, 450 110th Avenue NE in Bellevue.

Most of the comments generally supported the project. Some of the more common specific comments submitted at these meetings included:

- Would like to see the project implemented as soon as possible.
- Concerned about privacy and electronic toll collection.
- Would like to see what effect this will have on air quality.
- Concerned about how tolling impacts low-income families.
- Encouraged by the potential reduction in congestion.
- Increase the number of buses and bus routes.
- Like the plans for the electronic signage.

We held a separate scoping meeting for federal, state and local agencies, as well as Native American tribes on August 6, 2008, at the WSDOT Urban Corridors Office in downtown Seattle. We mailed letters on July 24, 2008, to

all the agencies and tribes that have jurisdiction or possible interest in the project inviting them to this meeting. The letter also stated that if interested parties could not attend the meeting, written comments were welcome. Several municipalities attended the meetings. No Native American tribes attended the scoping meeting. We did receive feedback from a Muckleshoot Indian Tribe staff person over the phone. Her primary concern was the potential effect of additional lighting on fish in Lake Washington.

Details about the public and agency scoping meetings, including all comments received and responses to those comments, can be found in the *SR 520 Urban Partnership Variable Tolling Project Scoping Report* located in Appendix G.

Other Outreach

The 520 Tolling Implementation Committee conducted additional public outreach between June and December 2008. The Committee solicited feedback from the public on several SR 520 tolling concepts, including tolling SR 520 in 2010 as proposed by this project. Rather than conduct an extensive parallel public outreach program to ask similar questions, we instead relied on the outreach efforts of the Committee.

The Committee conducted 9 open houses, 10 public meetings, and numerous presentations to over 20 local jurisdictions. More than 16,000 people visited the Committee's website, over 700 attended an open house, and 13,000 submitted comments or took an on-line survey to share their opinions on tolling options for the SR 520 corridor. In addition, the Committee conducted a statistically valid, random-sample telephone survey with results very similar to those received from the 8,000 people who took the on-line survey. Their surveys found:

What is the 520 Tolling Implementation Committee?

The 520 Tolling Implementation Committee was created by the state legislature in 2008 and comprised of the Executive Director of the Puget Sound Regional Council, the Washington State Transportation Secretary, and a Washington State Transportation Commissioner.

The Committee was responsible for gathering input from the public, evaluating diversion of traffic from SR 520 to other transportation corridors, evaluating different tolling technology, exploring opportunities to partner with businesses to reduce congestion and contribute to funding the project, and reporting to the governor and legislature by January 2009. Detailed information can be found on the Web at www.build520.org.

- Three-fifths of the respondents supported tolling the Evergreen Point Bridge as a means of paying for a portion of future corridor improvements.
- When respondents learned that electronic tolling means vehicles travel at normal speeds through the toll area, a third or more were much more likely to support tolling the Evergreen Point Bridge.
- More than half supported beginning tolling of the existing Evergreen Point Bridge in 2010 when they knew that such early tolling will result in lower tolls and financing costs.
- About half supported beginning tolling of the existing Evergreen Point Bridge in 2010 when they knew that such early tolling will result in faster travel speeds on the Evergreen Point Bridge.
- Most supported variable rate tolling, and it was even more appealing when respondents knew that the toll rates during off-peak times will be about half of peak toll rates.

Outreach to Low-Income and Minority Populations

As mentioned above, the 520 Tolling Implementation Committee hosted a number of open houses. The Committee ran advertisements in the following newspapers to engage low-income and minority people:

- *Northwest Asian Weekly* (English language publication that serves an Asian-American audience)
- *Siete Dias* (Spanish language publication, translated advertisement)
- *The Seattle Medium* (targeting African-American audiences)
- *Northwest Observer* (targeting African-American audiences)

Placards advertising the open houses were placed on 1,300 King County Metro and Sound Transit buses.

In November and December of 2008, the Committee public involvement team held interviews with agencies that serve low-income and minority people. They initially sought to interview 10 to 12 agencies that serve low- and moderate-income people, but many of the agencies contacted declined the opportunity. The Committee public involvement team was successful in interviewing these agencies:

- Catholic Community Services
- King County Housing Authority
- YWCA of East King County

We also considered feedback documented in summaries of meetings that the SR 520 Bridge Replacement and HOV Project outreach team conducted with social service agencies in 2004 and 2006. These organizations included:

- Circle of Friends
- Foundation for International Understanding through Students
- Fremont Public Association
- University of Washington Ethnic Cultural Center and Theater Complex

In addition, we reviewed comments submitted by Hopelink in 2006 for the SR 520 Bridge Replacement and HOV Project Draft EIS.

The *Environmental Justice Discipline Report*, Appendix D of this document, includes summaries from the meetings with social service agencies and the public comments from Hopelink.

In general, the outreach to low-income and minority populations indicated varied support for tolling SR 520 among these groups. Of the comments received that did

not support tolling, most concerned not being able to afford the tolls. Also, most thought that transit was not a good alternative to paying the toll, but that un-tolled routes were viable. Comments were also received indicating that discounts for low-income users would make tolling more fair.

Chapter 4 Project Description

Chapter 4 describes the features and details of the proposed Variable Tolling Project. It also describes how the project will be built and various permits and approvals that will be required.

Existing truss structure on Evergreen Point Bridge

What are the features of the project?

The SR 520 Variable Tolling Project includes several components:

- A single, two-way mainline tolling location on SR 520.
- Vehicle-mounted transponders.
- Signs on routes approaching the tolling location.
- A customer service center with storefronts on both sides of Lake Washington.

Tolling Location

Example of gantry structure that could be used on the Evergreen Point Bridge

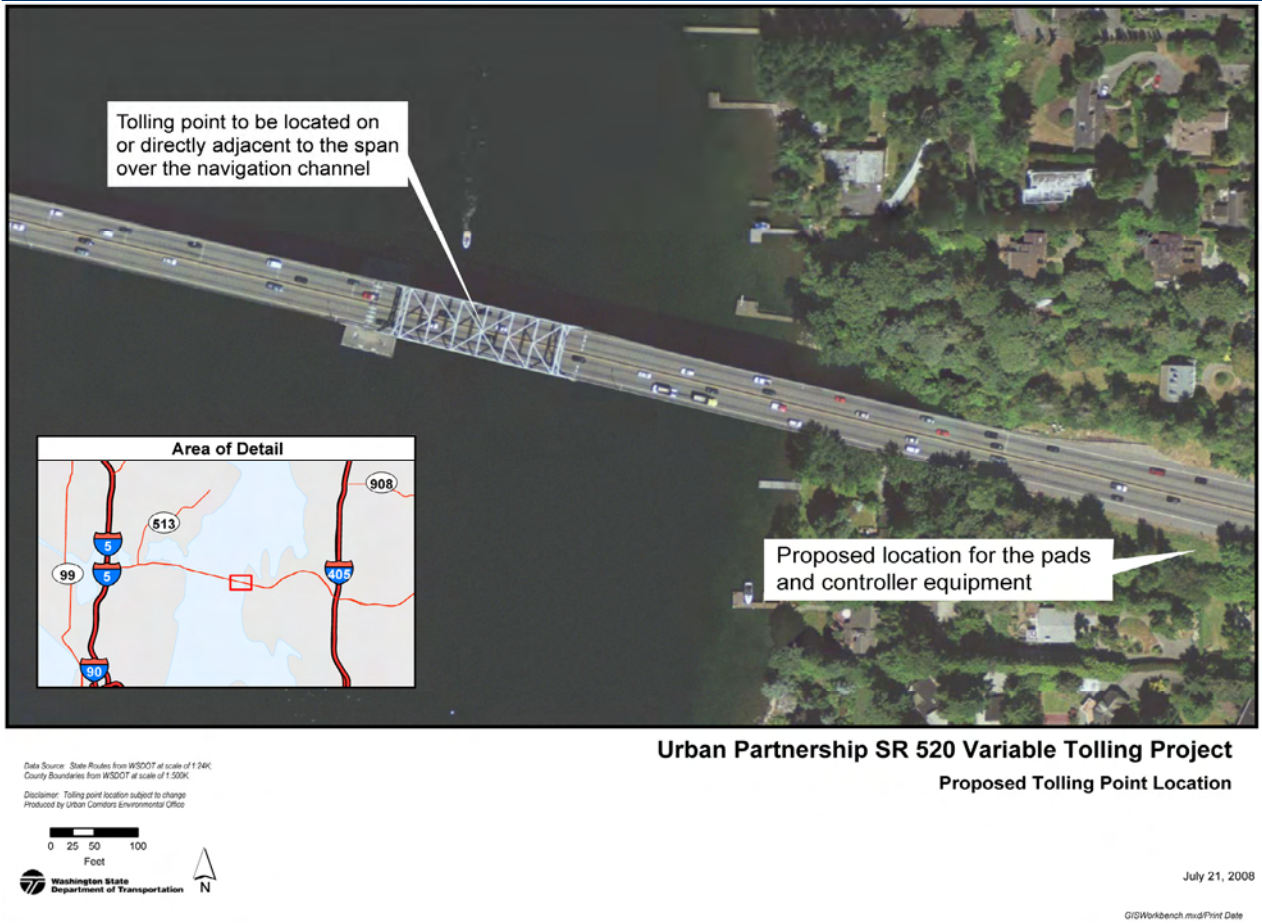
The project will place tolling equipment on the eastern end of the bridge either on the existing truss structure, or on a separate set of gantries near the truss structure. Tolling equipment will include overhead signs on the bridges for each direction of travel, an overhead automobile detection device, antennas, and other equipment that will read in-vehicle transponders, video cameras over each lane to capture license plate images, and either visible or infrared lighting.

In addition, roadside concrete pads, totaling approximately 150 square feet in area, with controller cabinets will be located on the east side of the lake just south of SR 520 in WSDOT right-of-way. A backup generator, or simply a generator transfer switch for

connection to a portable generator, will be included in case of power outages.

The proposed locations of the tolling equipment and the pads are shown in Exhibit 4-1.

Exhibit 4-1
Proposed Locations of the Tolling Equipment



Transponders

WSDOT will encourage drivers to obtain a transponder to place in their vehicle that is linked to a prepaid *Good To Go!*™ account. They will receive statements for their use of the bridge. This system is being used on both the Tacoma Narrows Bridge and the SR 167 High-Occupancy Toll (HOT) Lanes Pilot Project. Those without *Good To Go!*™ accounts will automatically have their license plate photographed and a bill sent to the address of where the

Windshield transponder

vehicle is registered. A surcharge will be added to the toll.

Signs

Signing along the corridor will be installed to inform drivers that they are approaching a tolled facility and identify the location of the last free exit. There are many options for the type and locations of the signing to be posted. For example, the toll rate could be posted, the price for the type of vehicle could be posted, the locations of the last opportunity to exit before being charged a toll could be posted, etc. We are currently studying these options and will make a decision before we implement tolling on SR 520. This decision will not affect the transportation analysis.

Customer Service Center

The customer service center maintains customer account and transaction information for those customers using the toll facility. Customers with *Good To Go!*™ accounts will have the amount of the toll debited directly from their accounts. Customers without *Good To Go!*™ accounts will be invoiced based on license plate information. Customers may access their accounts or make payments during business hours via walk-in storefronts, which will be located on both sides of Lake Washington, or 24 hours a day via telephone and the Internet. WSDOT is also evaluating whether the use of mobile units or retail locations will provide greater access to opening and maintaining accounts. WSDOT plans to migrate all current *Good To Go!*™ accounts to the new customer service center at some point to provide a single, integrated statewide center for all WSDOT tolling operations.

What is variable tolling and how will it reduce congestion?

Variable tolling can be defined as varying the price of tolls throughout the day to manage demand. This

reduces congestion by providing an incentive for drivers to change their behavior. For example, setting higher toll prices during the peak hours will encourage travelers to use an alternate route, an alternative mode of transportation, an alternate time of day, or eliminate trips altogether, which in turn will relieve congestion on SR 520 during peak periods.

WSDOT will collect tolls on SR 520 using electronic toll collection, which means no toll booths, no lines, and no delays for travelers since they will not have to stop and pay. This is similar to the way WSDOT collects tolls for the HOT lanes on SR 167 and a payment option for travelers using the Tacoma Narrows Bridge. The difference from these examples, however, is that electronic toll collection will be the only option for users of the Evergreen Point Bridge.

What toll rates are being considered?

Although the actual toll rates have not been determined, WSDOT developed two tolling scenarios that we used for this analysis. These scenarios represent the low and high ends of the range of likely toll rates. The low toll scenario represents an average one-way toll of $1.70, with daily rates between $1.00 and $2.95 depending on the time of day. The high toll scenario represents an average toll of $2.36, with daily rates between $1.50 and $3.80. All of these toll rates are expressed in 2007 dollars.

When and how will the project be built?

Currently our proposed construction schedule includes several elements. The first is to develop documents that request proposals from companies to build the project. We will complete this in early to mid-2009. Next, we will give the notice to proceed for construction in mid- to late-2009, and the project should be complete and opened in

mid- to late-2010. We expect construction to take approximately six months.

Prior to construction activities on SR 520, the WSDOT will require that the contractor install:

- High-visibility construction fencing to mark any sensitive areas located within the construction limits.
- Appropriate temporary erosion and sediment control measures in work areas prior to beginning construction activities. These measures will be monitored by WSDOT and the contractor for effectiveness throughout construction.

Installing tolling equipment above the roadway, building associated control equipment off the shoulder, and installing communications lines to connect the new system into the regional communications network will involve the following construction activities:

- Surveying the site to identify right-of-way limits, electrical and communication demarcation points.
- Clearing and grading areas adjacent to the existing highway where the tolling controller equipment will be located. WSDOT standard specifications, permit requirements and weather conditions (dry season or wet season) will limit the amount of clearing and open grading that can occur at any one time.
- Constructing the concrete pad upon which the control equipment will be mounted and installing the control equipment, transformer and backup generator on the concrete pad.
- Constructing the maintenance driveway to access the roadside equipment and the new electrical service. The driveway will be constructed of a pervious material like gravel. The new electrical service will be installed by the local utility company in coordination with WSDOT.

- Trenching in the south-side right-of-way east of the bridge structure and installing conduit to existing communications installations and the new electrical service.
- Installing conduit on the outside of the bridge, to connect over-lane equipment to the ground-mounted controllers.
- Running fiber optic lines and electrical conductors through the conduit. These will be connected on each end to create power and communications links to the new equipment.
- Installing lighting, cameras, and transponder readers overhead on the truss structure, over each lane.

The following final construction activities will be needed to complete the project:

- Testing the new equipment.
- Restoring roadside vegetation.
- Removing temporary erosion and sediment control measures and high-visibility construction fencing.

How will WSDOT let the public know about construction updates?

WSDOT will use the following techniques to provide people information regarding project construction activities:

- Updating project websites that report construction activities and the main SR 520 project Web site regularly
- Sending people messages using the existing SR 520 E-mail distribution list and other WSDOT e-mail lists
- Distributing media alerts to notify the media
- Ensuring that any road closures and detours are prominently signed

What permits and approvals will be required to build the project?

WSDOT will obtain the following permits and approvals for the project:

State

- Washington Department of Fish and Wildlife
  - Hydraulic Project Approval
- Washington State Department of Ecology
  - Coastal Zone Management Program Consistency Certification

Local

- City of Medina
  - Noise Variance
  - Shoreline Substantial Development Permit
  - Critical Areas Review

What are Critical Areas?

Critical Areas include wetlands, frequently flooded areas, critical recharge areas for local aquifers, geologically hazardous areas and fish and wildlife habitat conservation areas.

All cities and counties in Washington are required to adopt Critical Area regulations as stipulated by the Growth Management Act of 1995 (amended).

Chapter 5 The Environment: Existing Conditions, Project Effects, and Mitigation

Chapter 5 describes the existing conditions, project effects, and proposed mitigation for the social, economic, transportation, and environmental resources along the SR 520 project corridor.

Transportation

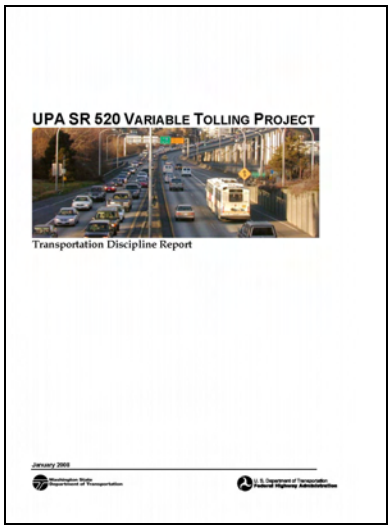
SR 520 connects Seattle on the west side of Lake Washington with Medina, Hunts Point, Yarrow Point, Clyde Hill, Kirkland, Bellevue, and Redmond on the east side of the lake and, therefore, serves as a critical connection for people crossing Lake Washington. Because SR 520 connects major communities in the state, WSDOT considers it a highway of statewide significance.

In addition, the transportation system around Lake Washington is a complex system of interconnected highway and freeway facilities. There are currently only three major roadways providing access between the east and west sides of Lake Washington: SR 520, I-90, and SR 522. These east-west corridors are connected by two major freeways running in the north-south direction: I-405 and I-5, east and west of Lake Washington.

This project will implement a multi-lane tolling system on the existing Evergreen Point Bridge, which is described in Chapter 4. We analyzed different tolling strategies and prices to determine the effects on traffic in the region. A detailed explanation of this analysis can be found in the *Transportation Discipline Report* located in Appendix E. Below is a summary of our transportation effects analysis.

How will the project affect traffic?

Methods and Analysis



We analyzed SR 520 and other major roadways in the area (I-405, I-5, I-90, and SR 522) to understand how the SR 520 Variable Tolling Project would affect future travel demand and operational performance on these roadways. We looked at 2010, which is when this project will begin, and 2016, the date currently planned for completion of a new six-lane Evergreen Point Bridge.

Because the proposed tolling will be all electronic, there will be no traffic disruptions such as those created by toll plazas. Therefore, the effects of the tolling within the project area relate to the change in the 'cost' of the route rather than to physical changes, such as a toll plaza. Since the toll rates have not been established, we analyzed these effects assuming both a low and a high price for the toll to understand the range of potential effects. The low and high toll scenarios are described in Chapter 4 of this document.

Projected future regional population and employment growth in the region will increase travel demand compared to existing conditions. We analyzed these future changes in travel patterns using the Puget Sound Regional Council's Transportation Planning Model (a regional travel demand model), which includes King, Pierce, Snohomish, and Kitsap counties. We used this model to forecast the future traffic volumes for 2010 and 2016 and to determine the traffic diversion from SR 520 onto other cross-lake routes, such as I-90 and SR 522, when the Evergreen Point Bridge is tolled.

This regional model is a very good tool for comparing the relative effects on travel choices resulting from the different toll scenarios and alternatives at a regional level. However, this model is not detailed enough for predicting what might occur at a particular interchange or local intersection. The model runs we used for our analysis allow us to make relative observations about

potential changes in travel patterns using the major highways in the network.

Total Cross-Lake Travel Volumes

Currently, all routes that cross or go around Lake Washington operate poorly during peak periods due to congestion; these routes include SR 520, I-90, and SR 522. Once the tolls are in place on SR 520, we estimate the reductions in the total number of cross-lake trips on all routes combined (as compared with the no toll scenario or No Build Alternative) will be:

- **2010 Low Toll Scenario:** 3 percent for the morning peak and 4 percent for the afternoon peak.
- **2010 High Toll Scenario:** 5 percent for both morning and afternoon peaks.
- **2016 Low Toll Scenario:** 3 percent for the morning peak and 4 percent for the afternoon peak.
- **2016 High Toll Scenario:** 3 percent for the morning peak and about 4 percent for the afternoon peak.

What are peak period volumes?

For this analysis, when we refer to peak period volumes we are talking about peak period bi-directional volumes. These are the sum of the a.m. and p.m. hourly volumes throughout the duration of the peak (6 a.m. to 9 a.m. in the morning and 3:00 p.m. to 6:00 p.m. in the afternoon) in both directions of travel.

This reduction in cross-lake traffic during the peak periods can be attributed either to people deciding to change the time of day of their trip (to avoid peak hours and the consequent higher tolls and congestion), to people changing their mode of travel from private vehicles to transit, or to people deciding not to make the cross-lake trip altogether.

Additionally, a system-wide analysis performed as part of the Tolling Implementation Committee *Tolling Report Prepared for the Washington State Legislature,* January 28, 2009 showed that the regional transportation network, (that is, beyond the limits of our study area) is relatively unaffected by the proposed tolling on SR 520.

Traffic on SR 520

The reduction in total cross-lake traffic can be attributed to the relatively large reduction in peak period volumes

specifically on SR 520 when compared with the No Build Alternative. We expect the reduction in peak period volumes on SR 520 due to people choosing other routes, changing to transit, or deciding not to make the trip across the lake will be:

- **2010 Low Toll Scenario:** 11 percent for the morning peak and 14 percent for the afternoon peak.
- **2010 High Toll Scenario:** 18 percent for the morning peak and about 17 percent for the afternoon peak.
- **2016 Low Toll Scenario:** 11 percent for the morning peak and about 12 percent for the afternoon peak.
- **2016 High Toll Scenario:** 14 percent for the morning peak and 13 percent for the afternoon peak.

This reduction in traffic will ease some of the increasing congestion expected on SR 520 by 2010 and 2016 compared to the No Build Alternative.

The results from the Puget Sound Regional Council model runs indicate that SR 520 will benefit—in terms of operational performance—from the tolling implementation as well. The reduction in traffic on this route will in turn yield better speeds and travel times. See Exhibit 5-1 for 2010 and Exhibit 5-2 for 2016.

Exhibit 5-1
Year 2010 Speeds and Travel Times

		Speeds Percentage Difference with No Build Alternative		Travel Times Percentage Difference with No Build Alternative	
		AM	**PM**	**AM**	**PM**
SR 520	Low Toll	18%	38%	-14%	-25%
	High Toll	17%	38%	-13%	-25%

Exhibit 5-2
Year 2016 Speeds and Travel Times

		Speeds Percentage Difference with No Build Alternative		Travel Times Percentage Difference with No Build Alternative	
		AM	**PM**	**AM**	**PM**
SR 520	Low Toll	18%	45%	-14%	-28%
	High Toll	18%	45%	-14%	-28%

Because traffic volumes will be reduced, we expect travel speeds to improve on SR 520 from 5 mph to 15 mph, depending on the peak period for both 2010 and 2016. This increase in average speed results in shortened travel times along the corridor by as much as 28 percent during the 2016 evening peak period.

The smaller differences in performance measures such as speeds and travel times observed between the low and high toll scenarios are likely due to the smaller difference between the high and low toll scenarios compared to the no toll (No Build) and low toll scenario. There is a 100 percent increase in cost from the no toll to the low toll scenario, whereas from the low to the high toll scenario the increase in cost is only 29 percent.

Traffic on Alternative Routes

As previously stated, the total cross-lake traffic is likely to decrease between three percent and five percent depending on the peak period. Therefore, the alternative routes (SR 522 and I-90) would only see a small increase in traffic in comparison with the No Build Alternative. For SR 522—and depending on the peak period and the tolling alternative—this increase will vary between one percent and three percent in 2010 and between one percent and four percent in 2016. For I-90—and also depending on the peak period and tolling alternative being considered—the traffic growth due to diversion

will range between one percent and three percent in 2010 and zero percent to three percent in 2016.

These small differences mean that levels of congestion on SR 522 and I-90 would be very similar to those which exist today.

How will the project affect safety?

WSDOT performed a safety analysis for the SR 520 corridor that looked at accident records between 2000 and 2002. WSDOT identified the following four locations along the corridor as high-accident locations during the three- year study period (Exhibit 5-3):

- SR 520 mainline near the I-5 interchange between mileposts 0.00 and 0.31.
- SR 520/Montlake Boulevard interchange westbound on-ramp between mileposts 0.00 and 0.22.
- SR 520/Montlake Boulevard interchange eastbound on-ramp between mileposts 0.0 and 0.42.
- SR 520/Lake Washington Boulevard westbound off-ramp between mileposts 0.07 and 0.27.

Exhibit 5-3
High Accident Locations on SR 520

The exposure to accident risk on a roadway is directly proportional to the average daily traffic. Because we expect a reduction in average daily traffic on SR 520 after tolling is implemented, the average exposure to accident risk on SR 520 will also be reduced. Thus, we expect the project to increase safety along SR 520.

The amount of additional traffic using SR 522 or I-90 after a toll is implemented will be small in relative (percent) terms. Therefore, we do not expect an increase in the exposure to accident risk on the other major roadways surrounding the lake beyond the natural increase that the no toll scenario (No Build Alternative) may produce by 2010 and 2016.

How will project construction affect traffic?

Motorists traveling along SR 520 will experience some disruptions and inconvenience. Construction will require temporary lane reductions or closures. WSDOT and its contractor will work together to ensure the maximum access through and around the project during construction. Lane closures will typically be restricted to nighttime hours.

These disruptions and inconveniences are minimized because much of the project will be constructed away from the roadway, off of the eastbound SR520 shoulder. Most, if not all, construction equipment will operate from the shoulder, and will not require lane closures.

Lane closures will be required in order to mount equipment above each lane. This work will occur during nighttime hours. Further closures may be required to adjust equipment during testing.

The amount of construction truck traffic will be minimal due to the limited extent of construction. Construction traffic will access most work areas from eastbound SR 520. Some vehicles will use westbound SR 520, as well as the Montlake Blvd. interchange and 108th Ave NE interchange in order to turn around.

How will construction effects on traffic be reduced?

WSDOT and its contractor will work together on the construction timing and sequencing to ensure the maximum access through and around the project area during construction. Some construction may be timed to avoid, as much as possible, the primary business hours at certain locations and special events. WSDOT will meet with individual businesses, local cities, and King County, as needed, to develop a plan that minimizes construction disruptions. The contractor will develop a traffic control plan that conforms to the established standards in the *Manual of Uniform Traffic Control Devices, Part VI* as well as any hour and/or date restrictions stipulated by WSDOT.

Social Resources

How many people are in the area and how is the area expected to grow?

According to the U.S. Census Bureau, the City of Seattle grew 9.1 percent from 516,259 in 1990 to 563,376 in 2000, while the City of Bellevue grew 26.1 percent (from 86,874 to 109,827). Together, Seattle and Bellevue comprise 37.2 percent of King County's total population. Exhibit 5-4 shows recent (2000 to 2007) population statistics for major cities and smaller municipalities that will be affected by the project.

According to forecasts prepared by the PSRC, King County is expected to grow by 38.2 percent between 2000 and 2040. An overview of the Puget Sound Regional Council's population forecasts for the major municipalities of Seattle, Bellevue,

Exhibit 5-4
Population Characteristics

	2000**	2007**	Percent Change 2000 to 2007
Bellevue	109,827	118,100	7.5%
Kirkland	45,054	47,890	6.3%
Redmond	45,256	50,680	12.0%
Seattle	563,376	586,200	4.1%
Clyde Hill	2,890	2,810	-2.8%
Hunts Point	443	480	8.4%
Medina	3,011	2,950	-2.0%
Yarrow Point	1,008	975	-3.3%
King County	1,737,034	1,864,300	7.3%
Puget Sound Region	3,275,857	3,582,900	9.4%

Source: U.S. Census Bureau, Puget Sound Regional Council

**Figures from 2000 are actual numbers from the Decennial Census, while figures from 2007 are estimated by the U.S. Census Bureau.

Kirkland, and Redmond, as well as King County, are provided in Exhibit 5-5.

Exhibit 5-5
Population Forecasts for Major Cities

	2000	2010	2030	2040
Bellevue FAZ**	104,003	111,004	137,692	149,219
Kirkland FAZ	44,009	47,758	54,848	56,809
Redmond FAZ	71,726	90,352	104,721	112,507
Seattle FAZ	563,313	586,365	672,441	718,651
King County FAZ	1,737,034	1,892,999	2,234,775	2,401,521

Source: Puget Sound Regional Council: Sub-County Forecasts, Amended 2007

**FAZ = Forecast Analysis Zone, which do not necessarily correspond to municipal boundaries.

What effects will the project have on social resources?

Due, in part, to the large amount of growth described above, congestion along SR 520 is expected to increase. The implementation of variable tolling on SR 520, compared to the No Build Alternative, will reduce traffic congestion during peak hours, thus improving travel reliability and reducing travel times. However, tolling on SR 520 will likely divert a small percentage of the traffic to nearby travel routes; most of this traffic will be redirected to I-90, I-405, and SR 522. We do not expect these small increases from diverted traffic to affect community cohesion. Further, the project will not construct any walls, separations, or barriers that would divide or separate communities.

What are public services and where do they exist in the project area?

Public services include fire and police protection, schools, and emergency services. Exhibit 5-6 shows the locations of public services in and around the project area.

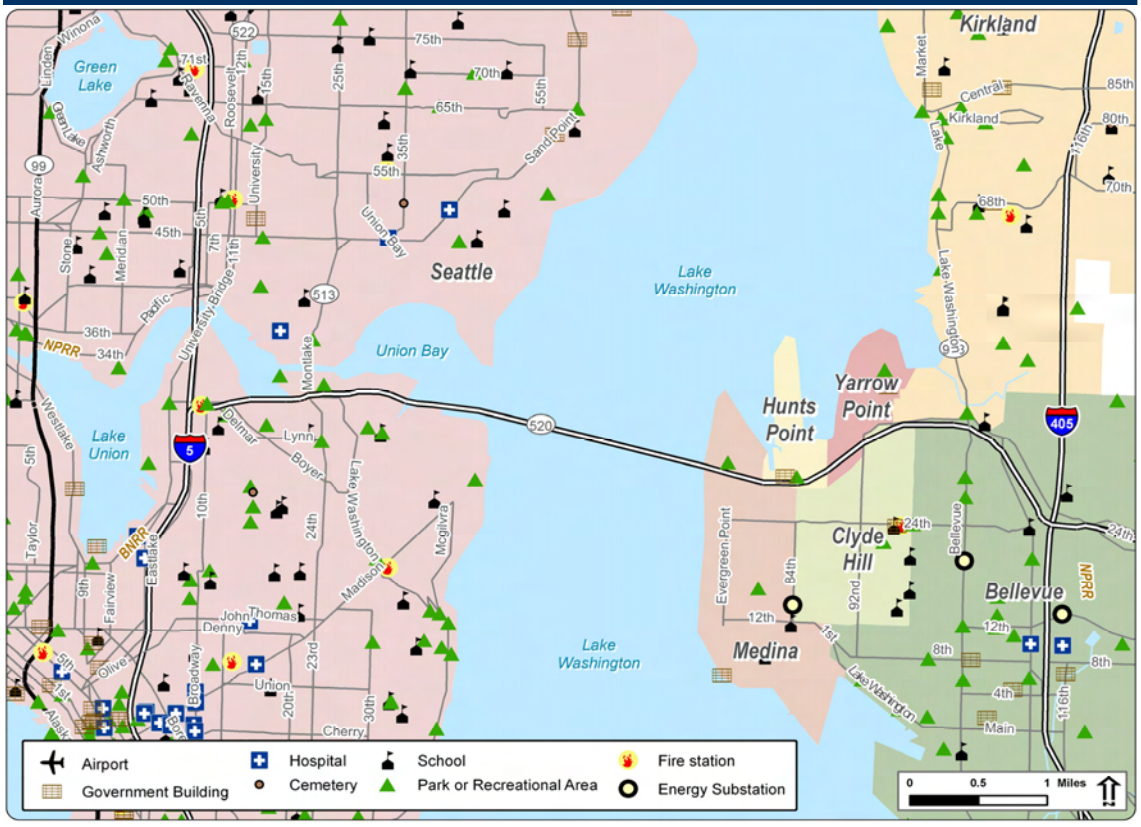
Seattle Fire Station #22

What effects will the project have on public services?

Increased mobility, increased reliability, and decreased travel times along SR 520 will benefit emergency service

providers who use the roadway as an emergency service route and improve access to any public service facilities located along SR 520. Conversely, a slight decrease in mobility along routes that will accommodate diversion traffic could affect emergency services by slightly increasing response times. We expect this effect on emergency response times to be minor. Public service providers will need to pay a toll to use the Evergreen Point Bridge; however, in the case of emergencies, the toll is refunded to the provider.

Exhibit 5-6
Public Services



How will construction effects on public services be minimized?

WSDOT will coordinate in advance with emergency services, law enforcement, public service providers, and schools regarding planned detours and delays. WSDOT

will fully explain the project and familiarize them with the construction traffic plan that will be used. Additionally, WSDOT will regularly update project websites that report construction activities and the main SR 520 project website to provide information regarding construction activities and how drivers, residents, and businesses will be affected. WSDOT will require that road closures and detours are prominently signed and also widely distribute notice of changes to media covering the project area. WSDOT will coordinate with local emergency responders to ensure priority access for emergency and law enforcement vehicles.

What recreational areas are located near the project area?

Of the parks located immediately adjacent to SR 520, six are located in Seattle and four on the eastside of Lake Washington. Exhibit 5-7 lists these parks and recreational facilities located along SR 520.

Exhibit 5-7
Parks and Recreational Facilities Along SR 520

Washington Park Arboretum	Seattle
Bagley Viewpoint	Seattle
Interlaken Park	Seattle
East Montlake Park	Seattle
Montlake Community Center and Playfield	Seattle
McCurdy Park	Seattle
Hunts Point Park (D. K. McDonald Park)	Hunts Point
Fairweather Park	Medina
Wetherill Nature Preserve	Hunts Point and Yarrow Point
Yarrow Bay Wetlands	Kirkland

Three trails fall within the project area: the Bill Dawson Trail (Montlake Bike Path) heads north from the Montlake Playfield in Montlake Park and travels underneath SR 520; the Arboretum Waterfront Trail starts in the north part of Washington Park Arboretum, crosses underneath SR 520, then heads west to East Montlake Park; and the Points Loop

Wetherill Nature Preserve in Hunts Point.

Trail is east of Lake Washington, adjacent to SR 520 on the north.

Will the project affect any recreational areas?

The SR 520 Variable Tolling Project will not have any effect on parks or recreational facilities.

Environmental Justice

Why is it important to consider Environmental Justice during planning?

Environmental Justice acknowledges that the quality of our environment affects our lives, and negative environmental effects should not disproportionately burden low-income or minority communities.

Negative environmental effects associated with transportation projects may include, among others: limited access to a publicly-funded facility, disruptions in community cohesion, presence of hazardous materials, raised noise levels, or increased air or water pollution.

What studies did we complete for this analysis?

We used four approaches to collect data on low-income and minority populations:

- Demographic analysis
- Surveys of Evergreen Point Bridge users
- Focus groups and telephone interviews with Evergreen Point Bridge users
- Public involvement activities

We also collected data on limited-English proficient populations to ensure that our outreach efforts take into account the potential need for translation. Based on the results of our data collection, surveys were translated

What federal orders and policies guide Environmental Justice?

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations in 1994 was issued to reinforce the importance of fundamental rights and legal requirements contained in Title VI of the Civil Rights Act of 1964, as amended, and NEPA.

Each federal agency issued implementing orders. The USDOT (USDOT Order 5610.2) and FHWA (FHWA 6640.23) orders require federal agencies to explicitly consider human health and environmental effects related to transportation projects that may have a disproportionately high and adverse effect on minority or low-income populations.

Executive Order 13166 compels agencies to evaluate the effects of projects on people with limited-English proficiency (LEP), in order to avoid discrimination on the basis of national origin.

Other federal laws, such as the National Environmental Policy Act (NEPA), Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 as amended, the Civil Rights Restoration Act of 1987, and the Transportation Equity Act (TEA-21) also include the nondiscrimination requirements outlined in Title VI.

into Spanish. For more information on how we collected information on bridge users, see Appendix D of this EA.

Why is public involvement important?

Public involvement is important so all the public, especially low-income or minority populations potentially affected by a project, have meaningful opportunities for involvement during project planning and development. Public involvement helps identify project impacts as early as possible so that they can be avoided and/or mitigated. Public involvement can include neighborhood meetings, open houses, and booths at community festivals.

What neighborhoods may be affected by the project?

Neighborhoods that have the potential to be affected by the project include:

- Neighborhoods from which traffic on the Evergreen Point Bridge originates.
- Neighborhoods surrounding the Evergreen Point Bridge.
- Neighborhoods surrounding untolled alternate routes that may be used by drivers who want to avoid paying the toll on the Evergreen Point Bridge. These include neighborhoods surrounding SR 522 north of Lake Washington and the I-90 Bridge.

Neighborhoods from which traffic on the Evergreen Point Bridge originates

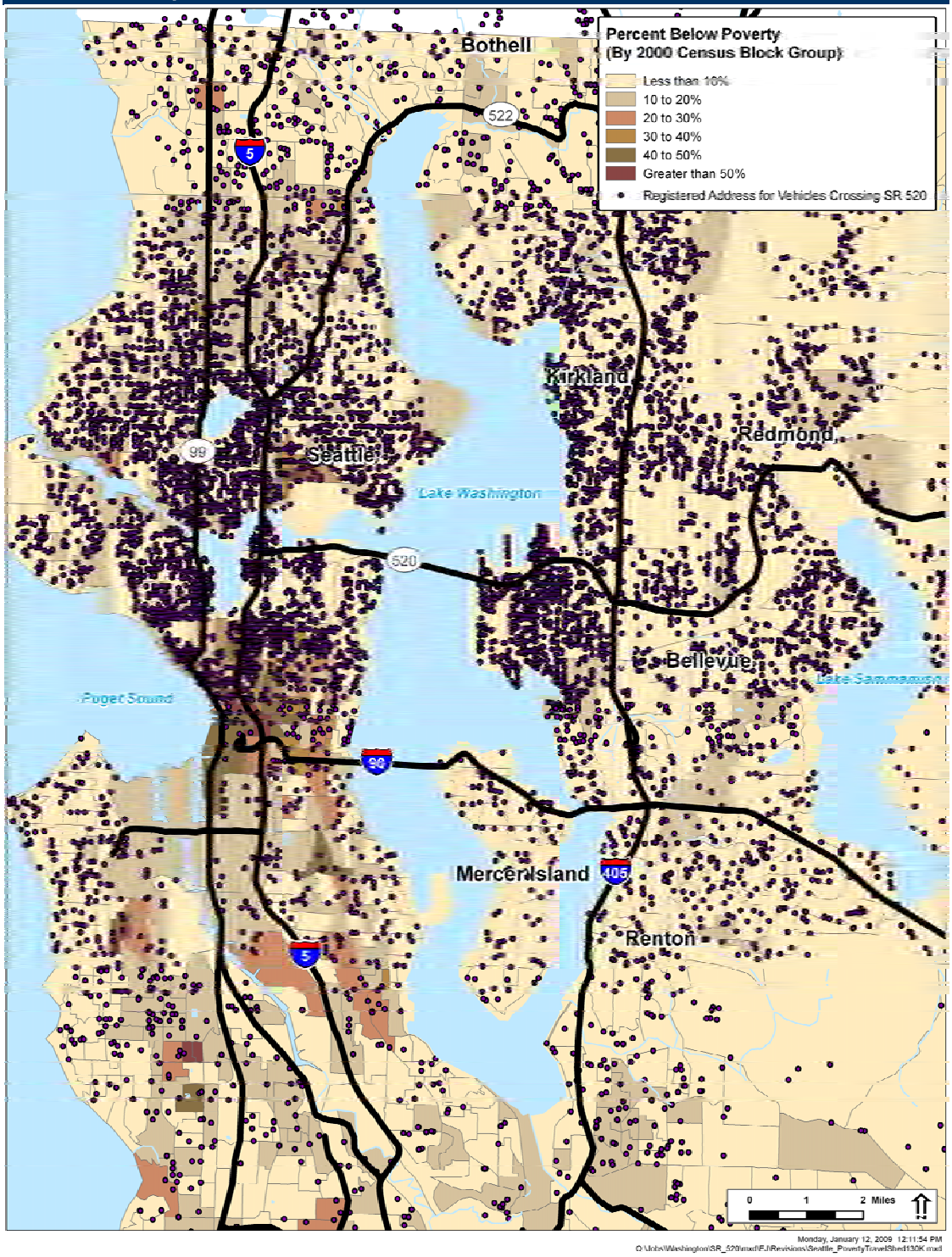
The tolling of the existing Evergreen Point Bridge will affect users of the facility as much as it will affect people living and working near the facility. To identify Evergreen Point Bridge users, we examined the communities from which trips on the Evergreen Point Bridge originate. Residents within the SR 520 travelshed are comprised of low-income and/or minority populations, and non-low-income and/or non-minority populations (see Exhibit 5-8).

What is a Travelshed?

A travelshed refers to the geographic area from which traffic on a given facility originates.

Our demographic analysis indicates that 8.8 percent of households in the SR 520 travelshed have incomes below the federal poverty level and 28 percent are minority, according to the 2000 U.S. Census. Based on this information, it is probable that at least some of these households use the Evergreen Point Bridge.

Exhibit 5-8
Low-income Populations in Travelshed



In our telephone survey of Evergreen Point Bridge users, we spoke with 318 low-income and/or minority respondents. Seventy-one of the 318 respondents had household incomes below the federal poverty level. In our intercept survey of transit users on the Evergreen Point Bridge, 107 of the 442 respondents were low-income and/or minority. Twelve of those 107 had household incomes below the federal poverty level.

Neighborhoods surrounding the Evergreen Point Bridge

There are low-income and minority populations living in the neighborhoods surrounding the Evergreen Point Bridge. We made this determination after reviewing the demographic analysis completed for the Environmental Justice analysis for the SR 520 Bridge Replacement and HOV Project Draft EIS. For this analysis, the Environmental Justice study area was defined as the polygon created on an area map by applying a one-mile buffer around these two sections of highway:

- SR 520 from the I-5 interchange in Seattle east to the 124th Avenue NE interchange in Bellevue.
- I-5 from the SR 520 interchange south to the Boylston Avenue East on-ramp to I-5.

While most of the census block groups in this study area have low concentrations of low-income and minority populations, there are relatively high concentrations of low-income populations in a few census block groups in the University District and in the South Lake Union neighborhoods in Seattle. There are also relatively high concentrations of minority populations in the Crossroads neighborhood in Bellevue.

Neighborhoods surrounding untolled alternate routes

Because one potential effect of tolling the Evergreen Point Bridge is that traffic may increase on untolled

routes (such as I-90 or SR 522), it is important to examine the communities surrounding non-tolled alternate routes.

According to our demographic analysis of census block groups in neighborhoods surrounding the SR 522 corridor, nearly 10 percent of residents had household incomes below the federal poverty level. The percentage of residents in each block group with household incomes below the federal poverty level ranged from 2 percent to 31 percent. Twenty-three percent of residents were minority and 5 percent were Hispanic. The percentage of residents in each block group who were minority ranged from 10 percent to 57 percent, and the percentage of residents who were Hispanic ranged from 1 percent to nearly 15 percent.

The term Hispanic is used by the U.S. Census Bureau for anyone who is of Hispanic origin, regardless of race.

There are also low-income and minority populations living in the neighborhoods surrounding I-90 between I-5 and I-405. The majority of these populations are concentrated in the neighborhoods at the western end of the I-90 Bridge. According to our demographic analysis of census block groups occurring by the I-90 Bridge, nearly 15 percent of residents had household incomes below the federal poverty level in 2000. The percentage of residents in each block group with household incomes below the federal poverty level ranged from 0 percent to 49 percent. Nearly 42 percent of residents were minority and nearly 6 percent were Hispanic. The percentage of residents in each block group who were minority ranged from 4 percent to 78 percent, and the percentage of residents who were Hispanic ranged from 1 percent to nearly 25 percent.

The U.S. Census Bureau provides statistics on minority and poverty status for block groups in the study area. However, because the data is almost ten years old (data for the 2000 Census was collected in 1999), data from the National Center for Education Statistics (NCES) further confirmed the presence of minority and low-income populations. NCES collects demographic data on students enrolled in school during the 2006-2007 academic year.

What are the potential effects of the project?

There are two ways in which project operation will benefit all users, including low-income and minority populations, compared to the No Build Alternative:

- People who drive across the Evergreen Point Bridge will benefit from improved speeds for all vehicles and trip reliability as a result of fewer cars on the bridge.

- With fewer cars on the Evergreen Point Bridge, transit riders, including low-income and minority riders, will benefit from improved transit speeds and reliability.

There are three ways in which the project will adversely affect low-income, minority or limited-English proficient populations compared to the No Build Alternative, if not mitigated:

- The cost of the tolls will present a burden to low-income bridge users.
- The cost of the tolls will present a burden to social service agencies that serve low-income populations.
- Bridge users may choose to purchase a transponder and set up an account with WSDOT to pay the toll, or have their license plate automatically photographed and receive by mail a bill for the toll with a surcharge added. Both options will present a burden to low-income and limited-English proficient Evergreen Point Bridge users.

FHWA directs WSDOT to apply two criteria to determine whether an effect is disproportionately high and adverse:

- Low-income and/or minority populations will predominately bear the effects.
- Low-income and/or minority populations will suffer the effects and the effects will be considerably more severe or greater in magnitude than the adverse effects suffered by the general population.

We determined that low-income and minority populations will not predominately bear the effects of this project. The toll will be charged to all bridge users and all bridge users may choose to purchase transponders or receive by mail a bill for the toll with a surcharge added. Even though it is not possible to determine exactly what proportion of bridge users are low-income, by looking at the travelshed map overlaid with U.S. Census data earlier in this section, it does not

appear that there are more bridge users coming from census block groups with higher proportions of low-income residents than other census block groups.

However, we did determine that the tolls on the Evergreen Point Bridge will be appreciably more severe for low-income users because they will have to spend a higher proportion of their income on the toll.

Previous analyses of tolling equity for several other projects have concluded the effect would not be disproportionately high and adverse for the following reasons:

- The benefits of improvements to trip reliability and speeds will offset the burden of the tolls.
- There are viable options to avoiding the toll. Furthermore, because low-income populations tend to use transit at a higher rate than the general population, improvements in transit speeds and reliability will offset the burden of the tolls.

While it is important to note that many low-income populations will benefit greatly from a faster, more reliable trip, Environmental Justice principles state that to offset a disproportionate adverse effect to low-income populations, the benefit also needs to disproportionately affect low-income populations. In this case, the benefits of a faster, more reliable trip apply to all people and not just low-income populations.

Although there are options for avoiding the toll, they may not be viable for many low-income bridge users. Based on the results of surveys, focus groups, and one-on-one interviews with low-income Evergreen Point Bridge users, it appears that transit is not a viable alternative to paying the toll for most low-income populations because service is infrequent, unreliable, requires several transfers, or takes too much time. Furthermore, although some national and regional studies suggest that low-income populations use transit

at a higher rate than the general population, results from our transit intercept survey suggest that transit routes on the Evergreen Point Bridge do not serve low-income populations at a higher rate than the general population.

In addition, although many survey respondents indicated that they would use un-tolled routes as an alternative to paying the toll, these routes will add substantial time, distance, and cost to the trip. The system could also limit access to the Evergreen Point Bridge for limited-English proficient populations, who may also have difficulty understanding how to purchase a transponder and set up an account.

A small amount of traffic currently crossing the Evergreen Point Bridge would use SR 522 north of Lake Washington or the I-90 Bridge instead of paying the toll on SR 520 (as documented in the Transportation Discipline Report for this project). Although there are low-income and minority populations living in the neighborhoods surrounding SR 522 and the I-90 Bridge, there should be no adverse effects on the low-income and minority populations living in these neighborhoods because there will not be a substantial amount of traffic diverting to SR 522 or I-90.

We do not anticipate that this project will have disproportionately high and adverse effects on minority populations. If reasonable mitigation strategies, such as those proposed later in this section are adopted, they will minimize disproportionately high and adverse effects on low-income and limited-English proficient populations.

What can be done to avoid or minimize adverse effects to low-income or minority populations?

If the SR 520 Variable Tolling Project is undertaken, WSDOT has already decided to employ these five strategies to help minimize adverse effects on low-income or limited-English proficient populations:

1. **Permanent customer service center storefronts:** WSDOT will establish permanent customer service center storefronts at either end of the Evergreen Point Bridge. Both locations will be transit accessible. Drivers will be able to purchase Good To Go!™ transponders and establish prepaid accounts with cash at these centers.

2. **EBT cards can be used to establish and replenish *Good To Go!*™ accounts:** Low-income Evergreen Point Bridge users will be able to establish and replenish their prepaid accounts using their Electronic Benefit Transfer (EBT) card. EBT functions like a debit card and allows recipients who receive federal benefits to pay for products and services, such as groceries and health care.

3. **Transponder retail outlets:** WSDOT will explore the possibility of establishing permanent *Good To Go!*™ retail outlets at convenient locations, such as grocery stores, convenience stores, or pharmacies throughout the region. Low-income focus group participants and Spanish-speaking interview participants indicated that this will make it much easier for them to purchase transponders and set up prepaid accounts with WSDOT.

4. **Multi-language outreach:** WSDOT will conduct outreach in multiple languages to provide information about how to purchase a transponder, establish an account, and use the system. Target languages will be the same languages that the Washington Department of Licensing uses for its translation: Chinese, Korean, Japanese, Russian, Spanish, and Vietnamese. WSDOT will also use pictograms whenever possible to explain the system. WSDOT will distribute information about the new tolling system and transponders throughout the region via community-based organizations, social service offices, churches, and schools; purchase

advertising in ethnic newspapers and radio stations; and establish hotlines with multi-lingual customer service agents well in advance of tolling.

5. **Training of social service workers:** WSDOT will provide social service agencies with information about tolling and options to avoid the tolls. This will assist social service workers in sharing accurate information with clients.

In addition, the following strategies could be considered for minimizing the effects of tolling on low-income populations. Some options may require legislative action, coordination with other agencies, or commitment of additional funding other than tolling revenue.

1. **Targeted transit improvements:** The Washington State Legislature could consider allocating additional funding to King County Metro Transit and Sound Transit to increase service along SR 520 routes that are used by low-income populations, especially in the University District and Crossroads in Bellevue. These routes could be identified by overlaying the travelshed map with King County Metro and Sound Transit route maps. Service could also be increased between low-income residential neighborhoods and job/education centers.
2. **Refunds to social service agencies:** The Washington State Legislature could allocate funding to provide refunds to social service agencies that broker transportation for low-income populations that meet certain thresholds.

For further discussion on mitigation, see Appendix D.

How will project construction affect low-income or minority populations?

No adverse construction effects are anticipated to disproportionately affect low-income or minority populations.

Economic Resources

What is the existing and projected employment in the area?

The Puget Sound Regional Council, which is the designated regional planning agency for the greater Seattle region that includes King, Kitsap, Pierce, and Snohomish Counties, releases yearly employment information by jurisdiction based on Washington State Employment Security Department data. Exhibit 5-9 displays employment information for 2007 for each jurisdiction surrounding the Evergreen Point Bridge, as well as King County and the Puget Sound Regional Planning Area.

As shown in Exhibit 5-9, Seattle has the largest population and employment numbers of any city in the region. Bellevue is second in these categories. This demonstrates the importance of an efficient transportation connection between the two cities.

What businesses located in the area surrounding the Evergreen Point Bridge may be affected?

Some types of businesses, including manufacturing and wholesale trade, transportation, and utilities, rely on their location adjacent to major transportation corridors to reduce transportation costs and maintain a competitive advantage. Also, some commercial businesses rely on locations near heavily traveled corridors to capture a large portion of their clientele. These businesses include gas stations, convenience stores, and hotels that are located adjacent to SR 520.

Regionally, the major employment centers of the University of Washington, downtown Seattle, downtown Bellevue, and the Overlake area of Redmond (Microsoft) have large numbers of employees that commute along the SR 520 corridor.

Exhibit 5-9
Population and Employment by Jurisdiction, 2007

How will the proposed project affect current and future employment trends?

Construction, operation, and maintenance of the toll facility on SR 520 will have no effect on employment trends in the region.

How will the project affect local and regional businesses that rely on SR 520?

Businesses located near the SR 520 corridor and the potential diversion routes are unlikely to see changes in revenues. Few consumers are likely to alter their transportation patterns enough to affect sales at local businesses.

Businesses that use SR 520 to deliver goods and services around the region would experience higher transportation costs due to the toll, compared to the No Build Alternative. However, these businesses would also benefit from improved trip reliability across SR 520 and a corresponding increase in productivity as a result of the project. This benefit would generally offset the higher transportation costs.

How will tolling affect local tax revenues?

Changes to sales and use tax revenues are unlikely, and overall spending habits are unlikely to change as a result of implementation of the project.

An improved transportation system and improved accessibility can help attract some business and residential development, which would increase tax revenues for affected jurisdictions. However, any improvement in congestion due to this project will likely have a negligible effect on development decisions, and therefore not have any noticeable effect on local tax revenues.

What will be done to avoid or minimize negative effects on economic conditions?

We expect no negative economic effects as a result of implementing variable tolling on the Evergreen Point Bridge. Therefore, no mitigation measures are proposed.

Surface Water, Water Quality, and Floodplains

What surface waters were analyzed?

For water resources, the analysis focuses on the eastern shore of Lake Washington, which is the only surface water body potentially affected since construction activity will be limited to this area.

What is the quality of the water in Lake Washington?

Lake Washington, at over 21,000 acres, is the largest lake in King County and the dominant water feature within the project area. The lake, long and narrow because of its glacial origins, has a drainage basin of approximately 470 square miles, much of which is residential. The lake drains into the Puget Sound via the Ship Canal.

Water quality in the lake is good for fish, wildlife, and recreational human use, but the lake is on the Washington State Department of Ecology 303(d) list for fecal coliforms (Ecology 2004). Pollutant sources for Lake Washington are typical of water bodies in urbanized areas and include runoff from commercial, industrial, and residential land uses.

What effects will the project have to surface waters, water quality, and floodplains?

The SR 520 Variable Tolling Project has relatively little ground-disturbing activity and construction needs, so localized water quality effects will be minimal compared to the No Build Alternative.

There will be very slight increases in impervious surface due to the installation of the concrete pad for the utility cabinets; however, because of the small size of the concrete pads, there will be no appreciable effect to stormwater runoff or water quality in the project area.

No construction would occur within existing floodplains; therefore, no effect will occur to floodplains.

What is groundwater and how is it affected?

Groundwater is water held underground in soil or permeable rock, often feeding springs and wells. The project will have no effect to groundwater.

What is the 303(d) list?

The 303(d) list identifies surface water body segments (lakes, streams, and ponds) with degraded water quality. Washington State Department of Ecology assembles available water quality data and publishes this list, as required under Section 303(d) of the federal Clean Water Act.

What are fecal coliforms? Fecal coliforms are bacteria present in human and animal feces. These bacteria can indicate the potential presence of harmful bacteria and viruses.

Why does impervious surface matter?

Impervious surface, such as concrete or pavement, can collect and concentrate stormwater runoff, as well as eliminate recharge areas for aquifers.

What measures are proposed to avoid or minimize effects to water resources during construction?

We will incorporate several measures into construction plans and specifications to reduce effects to water resources. These include:

- A Temporary Erosion and Sedimentation Control Plan will be prepared and implemented during construction. This plan will identify the best management practices (BMPs) that WSDOT and the contractor will use to control stormwater runoff and minimize sediment transport to Lake Washington.
- A Spill Prevention, Control, and Countermeasures Plan will be prepared according to WSDOT standards and implemented by the contractor during project construction. This plan details containment and cleanup procedures in the event of a spill of fuel or other chemicals during project construction. Effective implementation of this plan will greatly reduce the potential for release of toxic materials during construction.

Best Management Practices

Best management practices (BMPs), in terms of roadway construction water quality, refer to structural and nonstructural controls to minimize erosion and pollution. BMPs can include sediment basins, street sweeping, erosion control blankets, and seeding and/or mulching.

By implementing these measures, WSDOT will avoid or minimize construction effects to project area waters, as well as the fish and wildlife that occur in or use these waters.

Ecosystems—Wetlands, Wildlife, Aquatic Habitat

What is the local ecosystem like in the project area?

Lake Washington, including the shoreline area, is the part of the local ecosystem that could be affected by the project. Fish populations using the lake include the Endangered Species Act (ESA)-listed Chinook salmon, bull trout, and steelhead. The Lake Washington shorelines are developed with residential structures and uses along most of the shoreline length. Most of the

shoreline length has been armored to protect upland areas from erosion and this development has led to the loss of shoreline vegetation. However, numerous roost and nesting trees remain near the shorelines and are used by migratory songbirds and raptors including bald eagles.

How will this project affect the local ecosystem?

New power lines, power boxes, and monitoring equipment will run along the existing right-of-way or will hang from existing structures. Because these components will be installed in areas currently disturbed by roadway and other structures, permanent effects to the local ecosystem from their installation and operation are unlikely. Temporary effects will be limited to erosion and sedimentation resulting from soil disturbance and to disturbance resulting from construction noise compared to the No Build Alternative. These temporary effects can be minimized or avoided through the use of BMPs and timing restrictions.

Gantries with transponder readers and video cameras will create a new 24-hour light source over the water compared to the No Build Alternative. The video cameras require low-level lighting to detect the license plates of passing vehicles. Lighting from the video cameras is activated by passing vehicles and is at a low intensity to avoid startling or distracting drivers. The project will place the new lights on the Evergreen Point Bridge over deepwater habitat in a location near a sockeye salmon spawning area on the eastern shoreline of Lake Washington. Studies have shown that artificial lighting can promote early emergence from eggs and increased activity among newly hatched fish. Artificial lighting also affects predator-prey interactions among fish. Further discussion of effects caused by lighting systems on fish populations is discussed in *Ecosystems Technical Memo*, Appendix F.

Although fish and wildlife respond to lighting, there is already highway lighting on this portion of the bridge. In addition, the low-intensity video camera lights will be coincident with the higher intensity lights of passing vehicles. The effect of the new lighting will be indistinguishable from these existing light sources. Furthermore, the video camera lights will be directed toward the road deck resulting in minimal additional light reaching the surrounding environment. As a result, the new lighting installed by the project will have no effect on fish and wildlife.

The upper surface of a gantry may provide roosting or resting opportunities for birds. Seagulls (Western and glaucous-winged), Canada geese, swallows, and pigeons are known to use the Evergreen Point Bridge for resting or roosting, and large raptors (bald eagles and osprey) occasionally land on the structure. Since the gantry will provide only limited areas of flat surface, and those areas will be exposed to wind and rain, bird use is likely to be limited to short-term roosting and resting.

There are no wetlands in the area where project construction will take place; therefore, the project will not affect any wetlands.

How will construction affect vegetation, wetlands, wildlife, and fish?

Construction may generate noise and activity levels that will disturb wildlife in the area.

Temporary clearing or disturbance of vegetation will be likely limited to an area within 5 to 10 feet of the project footprint and the areas needed for staging.

If the project were to adversely affect surface water and groundwater through erosion, sedimentation, leaks, and/or spills, then these things would also adversely affect fish and fish habitat within the project area.

What will be done to minimize the effect of construction on ecosystems?

WSDOT will require the contractor to minimize the area disturbed by construction by limiting the amount of soil exposed and vegetation removed. The contractor will restore the disturbed areas to prevent erosion of exposed soils and enhance wildlife habitat.

Visual Resources

Why are visual resources considered when evaluating transportation projects?

Visual perception is an important component of environmental quality that can be affected by transportation projects. Because of the public nature and visual importance of transportation projects, both negative and positive visual effects must be adequately considered and addressed. When analyzing visual effects of a highway project, two views must be considered: the view from the road or bridge, and the view of the road or bridge.

Aerial view of the existing Evergreen Point Bridge looking west

What views can be seen within the project area?

When looking at SR 520 in the project area, the roadway alternates between sections that are at the same level as the ground around it, below ground level, and elevated above ground level on bridge structures. The Evergreen Point Bridge and roadway figure prominently in many views, and depending upon the vantage point, are a dominant part of the foreground and background.

View of the existing Evergreen Point Bridge looking west from the Eastside

The area where the project will affect visual resources is at the eastern end of the Evergreen Point Bridge. Although heavy vegetation limits views to and from SR 520 on the east side of Lake Washington, westbound drivers at the bridge approach see the Olympic Mountains in the distance on clear days and Husky Stadium and the Seattle shoreline in the middle distance. For viewers on the shoreline north and south of the bridge, the columns and roadbed

of the east approach are a dominant part of the foreground.

What will the project area look like after the SR 520 Variable Tolling Project is completed?

There will be very little visual change in the project area due to the implementation of the SR 520 Variable Tolling Project compared to the No Build Alternative.

The project will place the tolling equipment on the eastern end of the bridge either on the existing truss structure, or on a separate set of gantries near the truss structure. Tolling equipment will include overhead signs on the bridges for each direction of travel, an overhead automobile detection device, antennas, and boxes that will read the transponders, video cameras over each lane to capture license plate images, and either visible or infrared lighting.

In addition, roadside concrete pads with controller cabinets will be located on the east side of the lake just south of SR 520 in WSDOT right-of-way. A backup generator, or simply a generator transfer switch for connection to a portable generator, will be included in case of power outages.

If we install the equipment on the eastern truss structure, it will be barely noticeable to drivers on the bridge. If a gantry needs to be constructed near the eastern truss structure, that will affect the immediate foreground view as drivers approach, but will not affect any midground or background views from the bridge. All options will not be very noticeable looking toward the bridge from the shoreline or lake.

As mentioned, the project will install a new 24 hour light source on the bridge at the tolling location to detect the license plates of passing vehicles. The type of lighting will either be infrared, which would not be visible to the human eye, or visible lighting. If visible lighting is used, it will be activated by passing vehicles and will be at a

low intensity to avoid startling or distracting drivers. The low-intensity video camera lights will be coincident with the higher intensity lights of passing vehicles and the effects will be indistinguishable. In addition, the video camera lights will be directed towards the road deck resulting in minimal light reaching the surrounding environment.

The roadside equipment that will be installed will be small and likely not noticeable from the roadway by the traveling public.

What will be done to minimize visual effects of the project?

The gantry structure added to the bridge will be placed as close as possible to the existing truss structure and painted the same color to avoid foreground impacts.

If roadside equipment is noticeable, vegetative screening will be used to minimize the visual impact.

Will construction affect views?

Construction activities will temporarily affect foreground views due to construction equipment and storage piles. The equipment and storage piles used during construction will be removed upon completion of the project.

To reduce the temporary visual effects during construction, WSDOT will require the contractor to minimize the removal of existing vegetation and locate storage and staging areas in places that are not visually prominent to the extent practical. The contractor will address light and glare associated with nighttime construction activities by using downcast lighting sources.

Cultural Resources

What cultural resources are in the project area?

Our analysis of potential effects to cultural resources focused on the areas that will be physically changed or directly affected by the project. These areas included the Evergreen Point Bridge and approaches, as well as the portion of SR 520 just east of the bridge, where the control pads and cabinets will be located. The project will not have an indirect effect on cultural resources. A more detailed description of the analysis and findings can be found in the *Cultural Resources Technical Memorandum* found in Appendix F.

National Register of Historic Places (NRHP)

The NRHP requires federal agencies to identify and consider the effects of federally assisted projects on historic properties. Historic properties generally must be at least 50 years old, retain physical integrity and meet at least one of the four criteria of significance listed in the National Register Criteria for Evaluation.

Project construction on land will occur entirely in the SR 520 right-of-way, in areas previously disturbed by highway construction. Therefore, there is no potential for the project to affect archaeological historic properties.

We evaluated the Evergreen Point Bridge and approaches (also formally known as the Albert D. Rosellini Bridge) and concluded that the bridge is eligible for the National Register of Historic Places (NRHP).

Why is the Evergreen Point Bridge historically significant?

The Evergreen Point Bridge was completed and placed in service in 1963, four miles north of the first floating bridge on Lake Washington – the Lacey V. Murrow Memorial Bridge. A second floating bridge was considered by local residents as early as 1946, but it wasn't until 1960 that work on the bridge actually began. It took over two years to construct the Evergreen Point Bridge. It was the world's longest floating bridge (1.4 miles), and at $25 million, the world's most expensive. The floating section of the bridge alone cost 10.9 million. The bridge was partially financed by a thirty-five cent toll that helped pay for a forty-year, $30 million bond. The bridge was more widely used than the State Toll Bridge Authority expected: the bond was paid off 24 years early, in June 1979. The toll booths were removed

that year. When the original Lake Washington floating bridge (the Lacey V. Murrow Memorial Bridge) sank in 1990, the Evergreen Point Bridge became Lake Washington's oldest floating bridge.

Although the Evergreen Point Bridge was constructed in 1963, it is eligible for listing in the NRHP. It is eligible under Criterion C for its significance in bridge engineering and Criterion G, "a property achieving significance within the past 50 years if it is of exceptional importance" (NR Bulletin, How to Apply the National Register Criteria for Evaluation). The bridge will be 50 years old in 2013.

Will the project have adverse effects on the Evergreen Point Bridge?

Installation of the tolling equipment on the truss structure will constitute no adverse effect to the historic property under the regulations implementing the National Historic Preservation Act [36 Code of Federal Regulations (CFR) 800.5]. The tolling equipment will not compromise the Evergreen Point Bridge's integrity of location, design, workmanship, materials, setting, feeling, or association. The tolling equipment will only be minimally noticeable from the bridge, and will be limited to signs and some small equipment, such as cameras and transponder readers, over the roadway. This signage and equipment are minor, and will not alter any of the characteristics of the Evergreen Point Bridge that form the basis of its eligibility for listing in the NRHP. Department of Archaeology and Historic Preservation staff, on behalf of the State Historic Preservation Officer, has concurred with this determination.

Public Utilities

What public utilities exist in the project area?

Electricity and Natural Gas

Puget Sound Energy provides electricity and natural gas to Medina, where the project will install tolling equipment. Overhead and underground transmission lines are located adjacent to SR 520.

Water and Sewer Services

Bellevue Utilities Department provides water service to Medina. Various water mains cross under SR 520 to provide services to consumers in the area. Medina maintains its own stormwater drainage system.

The King County Department of Natural Resources Wastewater Treatment Division provides sewer treatment services for the entire project area.

What effects will the project have on public utilities?

There will be no negative effect on utilities due to this project. Some electricity will be required to operate the tolling equipment, compared to the No Build Alternative; however, the amount needed will be negligible.

How will construction affects on utilities be minimized?

WSDOT will require the verification of utility locations with permit and franchise holders during final design. All existing utility locations will be shown on the construction plans. Utility providers will be given advanced notice of construction activities. If utility relocations are necessary, WSDOT will work with the providers to relocate the utility in accordance with state law. In addition, the contractor will verify utility locations as required by law prior to any excavation work.

Land Use

What are the existing land uses in the project area?

SR 520 enters Seattle on the west side of Lake Washington. Land use in this area consists of mostly single-family residential, with scattered commercial uses and publicly-owned open spaces (Department of Planning and Development 2007). The University of Washington campus is located north of Portage Bay and Union Bay, just north of the Evergreen Point Bridge (SR 520).

View of the University of Washington

SR 520 enters Medina on the east side of Lake Washington. Most land use in Medina, Hunts Point, Clyde Hill, and Yarrow Point consists of single-family housing with scattered commercial businesses. A small part of the Lakewood neighborhood in the Kirkland abuts SR 520 just east of Yarrow Point. The Kirkland area is mainly composed of residential areas, park and open space, and office buildings.

Bellevue, located east of Clyde Hill, is the largest city on the east side of Lake Washington that will be affected by the project. The Bellevue area consists of retail and office centers, as well as low-, medium-, and high-density residential neighborhoods. Bellevue considers the area surrounding SR 520 to be a major employment center for the city (City of Bellevue 2008).

What will future land use look like in the project area?

Little change in land use is expected for the area near SR 520 in Seattle (Department of Planning and Development 2007). Likewise, future land uses will not differ from existing uses in the smaller cities of Medina, Clyde Hill, and Hunts Point. Overall, these communities are largely built out, and little growth is anticipated over the next 20 years

However, land use changes are planned for the Bel-Red area of Bellevue situated immediately southeast of the SR 520 and I-405 interchange. On February 17, 2009, the Bellevue City Council approved a plan to guide the transition of the Bel-Red area from light industrial to a mixture of higher density retail, office and residential uses. This land use transition is likely to extend beyond the duration of the SR 520 Variable Tolling Project.

What effect will the project have on land use?

We do not anticipate changes in land use as a result of the project: the duration of the project is too short to change anything but choice of routes to cross Lake Washington.

Hazardous Materials

Hazardous materials can be encountered during the construction and operation of public projects. Examples of common hazardous materials include asbestos, lead-based paint, underground storage tanks, and total petroleum hydrocarbons.

Identifying known and potential contamination prior to construction is important because it can greatly reduce the possibility of exposure to people and the environment.

What contaminated sites are located in the project area?

Our analysis of hazardous materials focused on the east side of the Evergreen Point Bridge because this is the only area where ground will be disturbed by project activity. We identified five sites with recognized environmental conditions within one mile of the proposed location of the concrete pad and utility cabinets to be installed as components of the tolling facility (see Exhibit 5-10).

What are recognized environmental conditions?

Recognized environmental conditions refer to sites with past or present contamination of soil or groundwater. These sites are determined through literature searches, site observation, and best professional judgment.

Exhibit 5-10
Potentially Hazardous Materials in the Project Area (WSDOT 2006)

Will the project affect hazardous materials sites?

Construction will not occur on or adjacent to any sites with recognized environmental conditions. Construction will be wholly within WSDOT right-of-way and remote from these sites.

How will the effects of hazardous materials be minimized during construction?

WSDOT will specify in the construction documents that the contractor will avoid releasing or spreading any contaminated soil or groundwater encountered during construction. If excavation or dewatering of contaminated material is necessary, the contractor will properly segregate and contain the material during and after excavation and dewatering and will test the material to determine how it can be disposed of. The

contractor will handle and dispose of the material in accordance with applicable regulations.

Energy

Are there effects to energy associated with the project?

What is fuel efficiency?

For vehicles, fuel efficiency refers to how far a vehicle can travel per unit of fuel. This measure is usually expressed in miles per gallon or kilometers per liter.

Fuel used by vehicles on SR 520 will be the main energy use related to this project. Therefore, this section focuses on fuel efficiency, particularly as related to congested driving conditions. The SR 520 corridor is heavily traveled and frequently congested. Current heavy traffic volumes on SR 520 force vehicles to travel at less efficient speeds during many hours of the day.

According to the U.S. Department of Energy, fuel efficiency is greatest when vehicles travel between 45 and 55 mph. Because of the current conditions on SR 520, vehicles are often traveling below 45 mph during peak periods and are, therefore, traveling at less efficient speeds.

Traffic along SR 520 often creates stop-and-go conditions, which reduces fuel efficiency

Compared to the No Build Alternative, the project will improve traffic flow, reduce peak period traffic congestion along SR 520, and allow more cars to travel at more fuel efficient speeds. In addition, because the construction for the project is minor, very little energy will be expended to build it.

Since the project will improve traffic flow and increase average peak hour speeds, we anticipate that it will reduce overall energy consumption.

What measures will be taken to reduce effects on energy during construction?

WSDOT will develop specifications for project construction to encourage energy conservation. WSDOT will also adhere to construction practices that promote efficient energy use, such as limiting idling equipment, encouraging construction workers to carpool, and locating staging areas near work sites.

Noise

Environmental noise may interfere with a broad range of human activities in a way that degrades public heath and welfare. Therefore, traffic and construction noise analyses are required by law for federally funded projects and by State of Washington policy for other projects. Since this particular project is not adding lanes,

or changing the roadway configuration in any way, a full quantitative noise analysis with noise modeling is not required. However, we conducted a qualitative analysis to determine the potential for noise effects.

What is sound (noise)?

Sound can be defined as any change in air pressure that the human ear can detect from barely perceptible sounds to sound levels that can cause hearing damage. For example, sitting in the front row of a rock concert would have greater changes in air pressure compared to a quiet whisper in the library. When sounds are perceived as unpleasant, unwanted, or disturbing, they are normally considered "noise.".

What was the project area analyzed for this project?

According to the WSDOT *Traffic Noise Analysis and Abatement Policy and Procedures* (2006), all noise sensitive sites within 500 feet of the proposed edge of pavement should be evaluated for potential noise effects.

What are noise-sensitive sites?

A location of an outdoor area where frequent human activity takes place that may be affected by highway traffic noise.

What criteria are used for assessing noise effects?

The FHWA Noise Abatement Criteria (NAC) defines noise levels for land activity categories. WSDOT has adopted these NAC and defines noise levels that, if approached [within 1 decibel (dBA)] or exceeded, require noise abatement consideration (see Exhibit 5-11 for various land use categories). FHWA guidelines also state that noise abatement should be considered when the noise levels substantially exceed the existing noise levels [23 CFR 772.5(g)]. This criterion is defined by WSDOT as increases in the Leq of 10.0 dBA or more above existing noise levels.

What are some key terminologies used to describe noise?

Decibels—a decibel is a unit of measure for sound.

dBA—This represents the noise levels in decibels measured with an A-weighted frequency. The A-weighted frequency corresponds to the frequencies that the human ear can detect.

What are typical neighborhood noise levels?

Typically, nighttime noise levels are lower than daytime levels since most people are more active during the day. In general, rural areas can have noise levels ranging from 50 to 60 dBA, and urban areas can have noise levels as high as 70 to 80 dBA.

Exhibit 5-11
Noise Abatement Criteria, Hourly A-Weighted Sound Level Decibels (dBA)

Activity Category	$L_{eq(h)}$	Description of Activity Category
A	56 (exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need, and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	66 (exterior)	Picnic area, recreational areas, playgrounds, active sport areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	71 (exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	None	Undeveloped lands.
E	51 (interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

How will the proposed project affect noise levels?

SR 520 is currently at capacity for much of the day. Compared to the No Build Alternative, traffic levels on SR 520 will be reduced between 11 percent and 18 percent as a result of implementing the variable toll. Typically, a reduction in traffic volumes by 25 percent will only reduce noise levels by one decibel. Therefore, we do not anticipate that there will be a substantial difference in future noise levels on SR 520 compared to existing noise levels.

We anticipate that I-90 will experience more of an increase in traffic volumes due to tolling SR 520 compared to other alternate routes, since this corridor would be the shortest alternate route for travelers crossing Lake Washington. SR 522 will have the lowest increase in traffic volumes since travelers would have a longer trip compared to using the SR 520 and I-90 corridors. Since these routes will receive additional traffic, some additional noise will occur as well. A doubling of traffic corresponds to an increase in noise of three decibels, which is typically the minimum change in noise level perceptible to the human ear. Because the total traffic increases along these routes will not be more

than one percent to four percent, noise levels are not likely to increase over one decibel. The change in noise levels on alternate routes is unlikely to be perceptible.

Will noise levels be affected by construction activities?

Construction of tolling

Noise levels will temporarily increase as a result of construction activities. These activities will only take place in Medina. Medina, like most cities, relies on the Washington Administrative Code (WAC), Chapter 173-60, Maximum Environmental Noise Levels.

The WAC states that construction activities should be conducted during daytime hours. If activities must occur during the nighttime hours, a noise variance will be required. Exhibit 5-12 summarizes the allowable exceedances for construction equipment during construction activities.

Exhibit 5-12
Washington State General Construction Allowable Exceedance

Allowable Exceedance	Equipment Covered
25 dBA	Equipment on construction sites, including, but not limited to, crawlers, tractors, dozers, rotary drill and augers, loaders, power shovels, cranes, derricks, graders, off-highway trucks, ditchers, trenches, compactors, compressors, and pneumatic-powered equipment
20 dBA	Portable-powered equipment used for temporary locations in support of construction activities, such as chainsaws, log chippers, lawn and garden equipment, and powered hand tools.
15 dBA	Powered equipment used in temporary repair or periodic maintenance of the grounds, such as lawn mowers and powered hand tools.

How will noise effects be avoided or minimized during construction?

Shielding of Stationary Equipment Generators are typically used during construction activities; shielding them with hay bales helps to reduce noise effects.

The following is a list of typical noise mitigation measures that may be included in construction specifications:

- Require all engine-powered equipment to have mufflers installed according to manufacturer's specifications.
- Require all equipment to comply with pertinent U.S. Environmental Protection Agency (EPA) equipment noise standards.

- Limit the nosiest construction equipment to daytime hours.
- Minimize noise by regular inspection and replacement of defective mufflers and parts.
- Locate stationary construction equipment far from nearby noise-sensitive sites.
- Install temporary barriers around stationary construction noise sources.
- Minimize or avoid idling of equipment.
- WSDOT will use the Occupational Safety and Health Act (OSHA)-approved ambient sound-sensing backup alarms that can reduce disturbances at night.

Air Quality

Why is air quality considered when evaluating transportation projects?

Air quality can be affected by transportation projects through increased pollutants including vehicle engine emissions and airborne particulates. Exposure to these pollutants can adversely affect human health (e.g. respiratory problems), vegetation, and wildlife.

Who regulates air quality?

The EPA, the Puget Sound Clean Air Agency (PSCAA), and the Washington State Department of Ecology regulate air quality in the project area.

What are the standards for air pollutants?

The Clean Air Act of 1970, which was last amended in 1990, requires the EPA to set concentration standards for criteria air pollutants. These concentration standards are known as the national ambient air quality standards (NAAQS). The criteria pollutants include: ozone, carbon monoxide, particulate matter (PM10 and PM2.5), sulfur dioxide, nitrogen dioxide, and lead. The Washington

What are criteria pollutants?

Ozone (O3)—is a gas which occurs in the atmosphere when compounds from sources such as cars, trucks, power plants, and factories react with sunlight.

Carbon Monoxide (CO)—is an odorless, colorless, and toxic gas which is emitted from auto, truck, or bus exhaust on roadways and in parking areas.

Particulate Matter (PM)—consist of particles found in the air such as dust, dirt, soot, or smoke and is directly emitted from construction sites, unpaved roads, fields, smokestacks, or fires.

Nitrogen Dioxide (NO2)—consists of airborne particles that can often be seen as a reddish brown layer over many urban areas. Sources include on-road vehicles, non-road equipment, fossil fuel combustion, industrial processes, waste disposal, and fire.

State Department of Ecology and the PSCAA have adopted state and local ambient air quality standards that are equivalent to or more stringent than EPA's NAAQS (see Exhibit 5-13). Pollutants typically associated with today's vehicle traffic are ozone, carbon monoxide, particulate matter, and nitrogen dioxide. Therefore, sulfur dioxide and lead are not discussed in this section.

Exhibit 5-13
National, State, and Local Ambient Air Quality Standards

Pollutant	National	Washington State	Puget Sound Region
Ozone 1 hour	0.075* ppm	0.12 ppm	0.12 ppm
Ozone 8 hour	0.075 ppm	n/a	n/a
Carbon Monoxide 1 hour	35ppm	35 ppm	35 ppm
Carbon Monoxide 8 hour	9 ppm	9 ppm	9 ppm
Nitrogen Dioxide 1 hour	n/a	n/a	n/a
Nitrogen Dioxide Annual	0.053 ppm	0.053 ppm	0.053 ppm
Particulate Matter (PM_{10}) 24 hour	150 ug/m^3	150 ug/m^3	150 ug/m^3
Particulate Matter (PM_{10}) Annual	50 ug/m^3	50 ug/m^3	50 ug/m^3
Particulate Matter ($PM_{2.5}$) 24 hour	35 ug/m^3	n/a	n/a
Particulate Matter ($PM_{2.5}$) Annual	15 ug/m^3	n/a	n/a

Notes:
*ppm=parts per million by volume; +ug/m^3=micrograms per cubic meter
n/a = No standard established.
Source:U.S. Environmental Protection Agency

What are conformity requirements?

Under the Clean Air Act, the SR 520 Variable Tolling Project must be in compliance with the NAAQS for all criteria pollutants. The project is located within King County in the Central Puget Sound Region. EPA has designated King County as a maintenance area for ozone, carbon monoxide, and particulate matter (PM10 only).

Attainment Area

An area designated by EPA where concentrations of a given pollutant are measured below the NAAQS.

Maintenance Area
An area that was formerly designated by EPA as a nonattainment area but whose recent monitoring data show pollutant levels have dropped below the NAAQS for a given pollutant. Although an area is considered attainment, it is subject to a 10-year maintenance period to ensure pollutant levels do not rise above the standards.

Nonattainment Areas
An area designated by EPA where concentrations of a given pollutant are above the NAAQS over a period of 3 years.

All nonattainment and maintenance areas are subject to the transportation conformity requirements set out in the Clean Air Act (40 CFR parts 51 and 93) and the Washington Clean Air Act.

Projects exempt from these conformity requirements include those that maintain the existing transportation facility, or improve mass transit or air quality, and are considered to have a neutral affect on air quality. The project is not proposing to construct additional travel or turn lanes; therefore, this project is exempt from a project-level hot-spot analysis for carbon monoxide.

The Clean Air Act requires transportation projects to conform to the State Implementation Plan (SIP), which means that the transportation activities will not produce new air quality violations, worsen existing violations, or delay timely attainment of the NAAQS. The SR 520 Variable Tolling Project is included in the SIP.

What are Mobile Source Air Toxics?

In addition to criteria air pollutants for which there are NAAQS, EPA also regulates air toxics. NAAQS have not been established for Mobile Source Air Toxics (MSATs). Most air toxics originate from human-made sources, including on-road mobile sources (automobiles and trucks), non-road sources (airplanes), area sources (dry cleaners), stationary sources (factories or refineries), and non-road equipment (forklifts, backhoes, etc.). There are six primary Mobile Source Air Toxics: benzene, acrolein, formaldehyde, 1,3-butadiene, acetaldehyde, and diesel exhaust.

What are MSATs?

Mobile Source Air Toxics:

Benzene—is a colorless liquid with a sweet odor used to make some types of rubbers, lubricants, dyes, detergents, drugs, and pesticides.

Acrolein—is a colorless or yellow liquid with a disagreeable odor used as a pesticide to control algae, weeds, bacteria, and mollusks.

Formaldehyde—is a colorless, pungent-smelling gas. Sources include pressed wood products, cigarette smoke, and fuel-burning appliances.

1,3–butadiene—is a colorless gas with a mild gasoline-like odor and made from the processing of petroleum.

Acetaldehyde—is also known as ethanol and results from combustion, such as automotive exhaust and tobacco smoke.

Diesel exhaust—airborne contaminant in workplaces where diesel is used.

How will the project affect air quality?

Traffic congestion contributes to the amount of air pollutants emitted into the air. The most common pollutants include carbon monoxide and particulate matter. Reducing congestion and allowing free flow of traffic will indirectly help to reduce air emissions compared to the No Build Alternative.

Implementation of tolling on SR 520 is anticipated to divert some traffic to alternate routes, such as I-90, SR 522, I-5, and I-405. Therefore, traffic will be reduced on SR 520 by approximately 11 to 18 percent, which will reduce emissions along SR 520 for all pollutants. However, traffic and emissions are anticipated to slightly increase along these alternate routes. Construction of the SR 520 tolling is anticipated to begin in 2009. By 2010, VMT along the alternate cross-lake routes is anticipated to increase compared to the No Build Alternative. I-90 would increase two to three percent and SR 522 would increase one to two percent. The north-south corridors were also analyzed showing no change in VMT along I-5 and a one to two percent decrease of VMT along I-405. The decrease in VMT along I-405 may be due to travelers choosing the nearest alternate cross-lake route instead of using SR 520.

Vehicle Miles Traveled (VMT)

VMT stands for vehicle miles traveled and is the number of miles vehicles travel each year. For transportation projects with set boundaries, VMT can refer to the aggregate number of miles that all the vehicles travel using the specified roadways.

Even though there would be a slight increase in VMT along the alternate cross-lake routes, the total VMT for all routes added together would decrease, which indicates travelers are choosing to travel during non peak hours, use more transit options during peak hours, or choose not to make the trip at all. Therefore, this project is not anticipated to have an adverse effect on air quality.

EPA has developed several emissions control programs for vehicle engines and fuels that will reduce MSAT emissions over the next 20 years. These programs include reformulated gasoline, national low-emission vehicle standards, Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and proposed heavy-duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Even if VMT increases, future MSAT emissions are likely to be lower than present levels due to these EPA programs. (FHWA 2006)

Will construction activities temporarily generate air pollutants?

Construction activities will temporarily generate air pollutants within the project area. Particulate matter (fugitive dust) is the most common air pollutant emitted during construction activities. Fugitive dust may become airborne during material transport, grading, driving of vehicles and machinery on and off site, and through high winds.

How will adverse effects from construction activities be avoided or minimized?

The construction contractor will be required to control fugitive dust during construction activities.

The following BMPs to control fugitive dust are typically used during construction activities:

- Spraying exposed soil with water or other suppressant to reduce emissions and deposition of particulate matter.
- Using phased development to keep disturbed areas to a minimum.
- Using wind fencing to reduce disturbance to soils.
- Minimizing dust emissions during transport of fill materials or soil by wetting down or by ensuring adequate freeboard (space from the top of the material to the top of the truck bed) on trucks.
- Cleaning up spills of transported material on public roads promptly.
- Scheduling work task to minimize disruption of the existing vehicle traffic on streets.
- Locating construction equipment and truck staging areas away from sensitive receptors, as practical, and in consideration of potential effects on other resources.

- Providing wheel washers to remove particulate matter that will otherwise be carried off site by vehicles to decrease deposition of particulate matter on area roadways.
- Covering dirt, gravel, and debris piles as needed to reduce dust and wind-blown debris.

Mitigation strategies to reduce MSAT emissions include:

- Reducing engine activity.
- Redirecting work or changing shift times to avoid community exposures.
- Making adjustments to equipment, including PM traps, oxidation catalysts, and other devices that provide an after-treatment of exhaust emissions.
- Using clean fuels, such as ultra-low sulfur diesel.

Chapter 6 Cumulative Effects

Chapter 6 describes the cumulative effects that could result from this project, including effects to transportation, Environmental Justice, air quality, and climate change.

What are cumulative effects?

NEPA and its implementing regulations require federal agencies to identify and analyze the direct, indirect, and cumulative effects of a proposed federal action to make an informed decision. Analyzing cumulative effects helps to understand the "big picture" effects of a project and the possible effects that can made on the regional environment. A federal agency's responsibility to address these effects in the NEPA process was established by the Council of Environmental Quality (CEQ) regulations. The CEQ regulations define a cumulative effect as:

> *"…the impact on the environment which results from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." (40 §CFR 1508.7).*

As defined above, "actions" include construction of other transportation or development projects, such as a highway interchange, a light rail route, a housing subdivision, or an office park.

Cumulative effects are the summation of effects on a resource resulting from the incremental effect of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes those actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

How were cumulative effects identified?

Our cumulative effects analysis only considers those resources that could be substantially affected by the project in combination with other past, present, and reasonably foreseeable future actions. Direct and indirect effects of the project are discussed in Chapter 5.

Based on our direct and indirect effects analysis, we determined that the SR 520 Variable Tolling Project may contribute to cumulative effects on the following elements of the environment:

- Transportation
- Environmental Justice
- Air quality
- Climate change

Why don't we study cumulative effects for all resources?

CEQ guidance only requires us to study cumulative effects on resources we affect either directly or indirectly. If there are no direct or indirect effects, there cannot be any cumulative effects

What sources were used to collect data for this section?

We used comprehensive plans, local city websites, PSRC research publications, and the *Puget Sound Regional Council Land Use and Travel Demand Forecasting Model* (January 2007) to analyze cumulative effects for the project area. In addition, we used the Cumulative Effects Discipline Report from the *SR 520 Bridge Replacement and HOV Project Draft EIS* (May, 2005) as a source of information for this section.

What are the geographic and temporal boundaries for this cumulative effects analysis?

The geographic resource boundaries we used for our cumulative effects analysis are based on the resources of concern and the potential effects to these resources.

For cumulative effects associated with traffic and transportation we used a geographic resource boundary comprising the area between I-5 and I-405 (SR 520, I-90, and SR 522), including I-5 and I-405. Because SR 520 is an integral link in a complex system of interconnected highways, changes to any one of these corridors could cumulatively affect the other corridors. At a more local scale we also considered reasonably foreseeable plans for development or redevelopment within approximately 1/4 mile of the proposed project area on SR 520.

These same cumulative transportation effects could also affect low-income populations in the same general area. Therefore, our boundary for the cumulative effects analysis associated with this element uses the same geographic resource boundary described above for transportation and traffic.

For air quality, we considered a wider area for cumulative effects because it must be looked at on a regional scale. Our geographic boundary for cumulative effects to air quality is King County.

Climate change is a global issue. Our analysis qualitatively addresses the potential effect of the project on climate change in the context of statewide efforts to address the issue.

The temporal boundaries for the analysis of cumulative effects should allow for the recognition of long-term trends as well as consider the effects of any future actions. The beginning boundary typically is based upon the availability of data or a meaningful event that has

influenced existing conditions (construction of a highway or railroad, for example).

We set the beginning of the temporal boundary for our cumulative effects analysis of this project with the opening of the first bridge across Lake Washington in 1940. This event drastically altered transportation and development patterns within King County.

Our cumulative effects analysis time frame extends in the future to 2016. We chose that year because it is when the SR 520 Bridge Replacement and HOV Project is expected to be completed. At that time, the existing Evergreen Point Bridge will no longer be in use. The new bridge built by the SR 520 Bridge Replacement and HOV Project, which is currently undergoing a separate environmental review, will likely have a different roadway configuration and different toll pricing. Therefore, the conditions we've analyzed in this document will no longer exist once the new bridge is completed in 2016.

What is the history of the area?

Historically, residential and commercial uses in the region were concentrated in Seattle. Until the Lake Washington Floating Bridge (later known as the Lacey V. Murrow Floating Bridge) was completed in 1940, the primary way people crossed Lake Washington was by ferry boat. However, the new bridge drastically reduced the time necessary to cross the lake and the Eastside became an attractive residential choice for those working in Seattle.

Interstate 90: the Homer M. Hadley bridge (left) and the Lacey V. Murrow (right) floating bridges, looking east toward Mercer Island.

After World War II, residential and commercial land uses expanded east across Lake Washington as a result of a new national trend of suburbanization; Medina, Hunts Point, Clyde Hill, Yarrow Point and Bellevue incorporated in the 1950s. Between 1960 and 1963, construction of the Evergreen Point Bridge (SR 520) additionally contributed to rapid growth east of Lake Washington.

In the last quarter of the twentieth century, the spread of urbanization resulted in greater population and employment on the Eastside of Lake Washington than in Seattle. With the increase in jobs on the Eastside, traffic across Lake Washington grew heavily in both directions. In 1989, the Homer M. Hadley Floating Bridge was built to provide more capacity across the lake on I-90; however, this additional bridge was not enough to offset the growth in traffic. Today, both corridors across Lake Washington are frequently congested.

What does the future hold for the area?

According to PSRC forecasts, the population in the Puget Sound region is expected to increase from approximately 3.5 million in 2006 to nearly 4 million people in 2016. Growth will be focused in urban growth areas, thereby increasing the density of development (PSRC's *Destination 2030*). Exhibit 6-1 shows existing and future employment and population characteristics for the four-county Puget Sound region.

Exhibit 6-1
Existing and Future Population and Employment Characteristics for the Puget Sound Region

	2006	2010	2016
Total Population	3,507,603	3,695,504	3,967,418
Total Households	1,386,593	1,470,054	1,612,194
Low Income Households	346,199	367,511	403,062
Upper-Income Households	347,085	367,510	403,048
Retail Employees	337,567	351,883	380,855
Government Employees	228,345	244,182	254,512
Employees in Education	90,302	93,613	98,768
Employees in Manufacturing	201,765	219,391	216,115
College Students	152,295	171,759	175,543

Source: PSRC Population and Employment Data model

Among the four counties (King, Kitsap, Pierce, and Snohomish) in the Puget Sound region, King County is expected to see the most change in both population and employment numbers (*Destination 2030*).

What projects were considered for this cumulative effects analysis?

We considered, for this analysis, effects from any other projects located within or close to our project's study area. The projects also must be reasonably foreseeable. This typically means that the project is likely to happen or probable, rather than merely possible.

Development

Seattle has not issued any permits for new non-transportation related development within the project area along SR 520. Medina, Hunts Point, Clyde Hill, and Yarrow Point do not anticipate any future (non-transportation related) development other than the construction of new single-family homes on the few remaining vacant lots in the communities and the demolition of single-family homes to be replaced by larger homes. According to a Planning Information Specialist in the Kirkland Planning and Community Development Department (E-mail on October 9, 2008), a developer is proposing to construct an additional office building at the Plaza at Yarrow Bay located at 10220 Lake Washington Boulevard (north of SR 520).

Transportation

There are a number of transportation projects planned in or near the project area:

- SR 520 Bridge Replacement and HOV Project
- SR 520 Eastside Transit and HOV Project
- I-90 Two-Way Transit and HOV Operations Project

- I-405 NE 195th to SR 527 Northbound Widening Project
- I-405 NE 8th Street to SR 520 Improvement Project
- I-405 South Bellevue Widening
- Sound Transit University Link Light Rail Project
- Sound Transit East Link Light Rail Project
- Other Transit Improvements
- Other Lake Washington Urban Partnership Projects

Descriptions of these transportation projects are provided below.

Highway Projects

SR 520 Bridge Replacement and HOV Project

This project will improve the SR 520 corridor from I-5 in Seattle to the vicinity of Evergreen Point Road. It would include replacement of all the existing bridges with newer, safer bridges designed to better withstand earthquakes and windstorms. WSDOT plans to be open the project to traffic in 2016. Both the new roadway configuration and the toll rates would be different from what is being studied for the SR 520 Variable Tolling Project.

SR 520 Eastside Transit and HOV Project

This project will complete the HOV lanes from Lake Washington to SR 202. HOV lanes and transit stops will be shifted from the outside to the inside of the roadway. Extensive improvements will be constructed along the approximately three-mile section of SR 520 between Lake Washington and 108th Avenue NE. These improvements include a new eastbound HOV lane and HOV lane direct access ramps to and from the west at 108th Avenue NE. Construction on this project is expected to begin in 2010 and be completed in 2013.

I-90 Two-Way Transit and HOV Operations Project

This project, a partnership between WSDOT and Sound Transit, will add HOV lanes to the I-90 outer roadway between Seattle and Bellevue. The project also includes new I-90 HOV on- and off-ramps on Mercer Island, and will improve I-90 HOV access at Bellevue Way. Stage 1 of the project, which includes new westbound HOV direct access ramps at Bellevue Way SE and 80th Avenue SE, opened for service on October 10, 2008. Stage 2 of the project involves improving eastbound I-90 from Mercer Island to Bellevue, and is scheduled to be constructed from 2010 to 2012. Stage 3 will provide improvements to eastbound and westbound I-90 between Seattle and 80th Avenue SE on Mercer Island and will be constructed from 2011 to 2014.

I-405 NE 195th to SR 527 Northbound Widening Project

The NE 195th to SR 527 Northbound Widening Project will add a new lane on northbound I-405 between NE 195th Street and SR 527. Construction is scheduled to start in 2009 and be complete by Winter 2010.

I-405 NE 8th Street to SR 520 Improvement Project

The I-405—NE 8th Street to SR 520 Improvement Project will build new structures to separate northbound traffic exiting to SR 520 from traffic entering I-405 at NE 8th Street in Bellevue. In addition, a new eastbound lane along SR 520 will be built to separate the on and off-ramps between I-405 and 124th Avenue traffic. A new on-ramp at NE 10th Street to SR 520 will also be built. Construction is scheduled to begin in 2009, and the affected area will be open to traffic in 2012.

I-405 South Bellevue Widening

The I-405—South Bellevue Widening Project, also known as the 112th Avenue SE to SE 8th Street Project, will help to relieve congestion for travelers coming in and out of Bellevue. Between 112th Avenue SE and I-90, a new northbound lane will be added, and the existing

northbound bridge over Coal Creek Parkway will be widened. Between I-90 and SE 8th Street, one new lane in each direction (from I-90 to SE 8th Street) will be added; the Wilburton Tunnel will be removed; a new three-lane, southbound bridge over I-90 will be built; and the existing southbound bridge over I-90 will be converted to carry northbound HOV traffic. Construction on this project began in spring 2007, and is scheduled to be finished in fall 2009.

Light Rail Projects

Sound Transit University Link Light Rail Project

University Link is a 3.15-mile light rail extension that will run from downtown Seattle to the University of Washington, with stations at Capitol Hill and on the University campus near Husky Stadium. Sound Transit is currently finishing final design work, and construction is scheduled to begin in early 2009. Sound Transit plans to open University Link for service in 2016.

Sound Transit East Link Light Rail Project

East Link is an approximately 18-mile long light rail extension that will run along I-90 from downtown Seattle to the Eastside. It will have 11 to 14 stations serving Seattle, Mercer Island, south Bellevue, downtown Bellevue, Bel-Red/Overlake, and Redmond. Although Sound Transit has not identified a final alignment yet, all alignments being considered will convert the center roadway of I-90 across Lake Washington to light rail operation. Sound Transit expects to start construction in 2013, with operations starting as early as 2020.

Other Transit Improvements

Lake Washington Urban Partnership

The transit elements of the Lake Washington Urban Partnership are focused on reducing congestion along SR 520 by providing alternatives to driving and paying a toll. King County Metro is the lead agency for the transit

elements of the Lake Washington Urban Partnership. King County Metro will purchase twenty 60-foot and twenty-five 40-foot hybrid motor coaches, and improve bus stops through real-time information signs about bus arrivals (at seven stops) and improved passenger shelters and lighting (at two stops). King County Metro will also expand park-and-ride facilities that serve the SR 520 corridor. They plan to replace a 613-space surface parking lot with an 853-space parking garage and by build a new 386-space parking garage.

King County Metro—Transit Now

King County Metro is currently implementing their Transit Now service expansion that was approved by voters in 2006. One element of Transit Now is RapidRide—a new streamlined bus service that will provide frequent, all-day service in several corridors. One of the five RapidRide corridors funded by Transit Now is the Eastside RapidRide line. It will operate between the new downtown Redmond Transit Center and the Bellevue Transit Center via the Crossroads and Overlake neighborhoods. Riders will be able to connect to high-frequency bus service across Lake Washington at the Overlake Transit Center and Bellevue Transit Center.

Sound Transit 2

Sound Transit will be increasing express bus service in the region in 2009 as a result of the Sound Transit 2 ballot measure approved by voters in 2008. The Sound Transit service expansion will increase the frequency of service on many routes, including three that cross Lake Washington. These routes are the 545 between Redmond and Seattle, 550 between Bellevue and Seattle, and the 554 between Issaquah and Seattle.

Other Lake Washington Urban Partnership Projects

Telecommuting Project

The telecommuting element of the Lake Washington Urban Partnership involves expanding telecommuting opportunities and transportation demand management beyond what it is today. PSRC is the lead agency for the telecommuting element of the Lake Washington Urban Partnership. Their efforts will include increasing outreach to employers about alternative transportation options and incentives to use them, and providing improved traveler information and trip planning services to employees. Widespread broadband Internet access and support from major employers will enable the expansion of telecommuting programs so more people can have the option to telecommute or use flextime. This will help reduce work trips during weekday peak commute times in the mornings and evenings.

UPA Active Traffic Management Project

This project will use Active Traffic Management techniques to help reduce congestion along SR 520. Specific techniques allow for the detection of incidents, facilitate the removal of disabled vehicles, and provide travelers with real-time information about traffic conditions, such as through 511 and electronically changeable roadway signage. WSDOT will install variable speed limit signs to facilitate smoother traffic flow during peak travel periods. Variable speed limits, improved on- and off-ramp access and real-time traveler information signs, will provide commuters with the tools and information they need for a more reliable trip.

What cumulative effects would result from the SR 520 Variable Tolling Project?

The following sections describe the potential cumulative effects of the SR 520 Variable Tolling Project compared to the No Build Alternative.

Transportation

Most of the projects described above will be under construction during the period 2010 and 2016 when the SR 520 Variable Tolling Project is operating. Both SR 520 and I-90 are likely to have construction projects between I-5 and I-405 throughout this period. WSDOT also plans to have some projects under construction on I-405 through 2012. We do not expect the SR 520 Variable Tolling project to have any noticeable cumulative effect on travel patterns in combination with the construction of these projects. Existing capacity constraints on the highway system and planned construction on both of the direct routes across Lake Washington will limit diversion related to construction. Overall, we expect construction of other projects to have a negligible incremental cumulative effect with the diversion related to the SR 520 Variable Tolling Project.

As the highway and transit improvements we identified are completed, we expect they will cumulatively improve regional mobility in addition to the congestion reduction from the SR 520 Variable Tolling Project. Transit users crossing Lake Washington will especially see cumulative benefits. The SR 520 Eastside HOV and Transit Project and the I-90 Two-way Transit and HOV Project will provide noticeable improvements in transit service reliability across Lake Washington on both corridors. Coupled with the transit improvements being implemented by King County Metro and Sound Transit, many transit users crossing Lake Washington will experience a noticeable cumulative improvement in

transit service between now and 2016. Transit use across Lake Washington will also likely see a cumulative increase as service improves and people look for ways to avoid the toll implemented by the SR 520 Variable Tolling Project.

Environmental Justice

Construction planned for the un-tolled routes around or across Lake Washington may make it more time-consuming for low-income SR 520 users to take an alternate route to avoid paying the toll. A potential positive cumulative effect is the transit service improvements described above will make it easier for some low-income users to use transit to avoid the toll on SR 520.

Will I-90 be tolled also?

The Washington State Legislature is currently considering a proposal to toll I-90 across Lake Washington. No decisions had been made at the time we did our analysis, so we did not consider a toll on I-90 reasonably foreseeable.

If I-90 were to be tolled, it will limit the un-tolled alternate routes available for crossing Lake Washington. A separate environmental review would be required for tolling I-90.

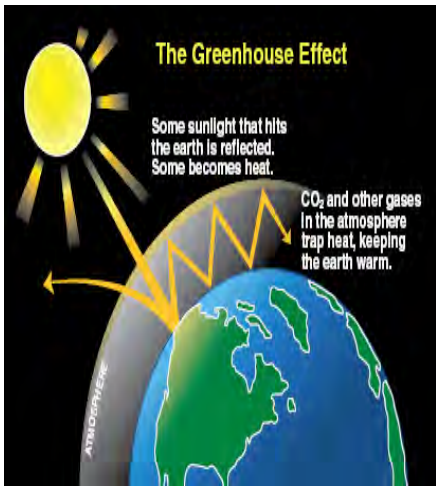
Air Quality

A reduction in congestion and a decrease in the volume of vehicles will likely reduce the amount of emissions emitted from autos. However, even with increases in traffic volumes, emissions are likely to be lower than present levels due to EPA's programs to reduce emissions by 2020. Overall, little affect is expected for air quality.

Climate Change

What are greenhouse gases and climate change?

Vehicles emit a variety of gases during their operation; some of these are greenhouse gases (GHGs). The GHGs associated with transportation are water vapor, carbon dioxide (CO_2), methane (also known as "marsh gas"), and nitrous oxide (used in dentists' offices as "laughing gas"). CO_2 makes up the bulk of the emissions from transportation. Any process that burns fossil fuel releases carbon dioxide into the air.

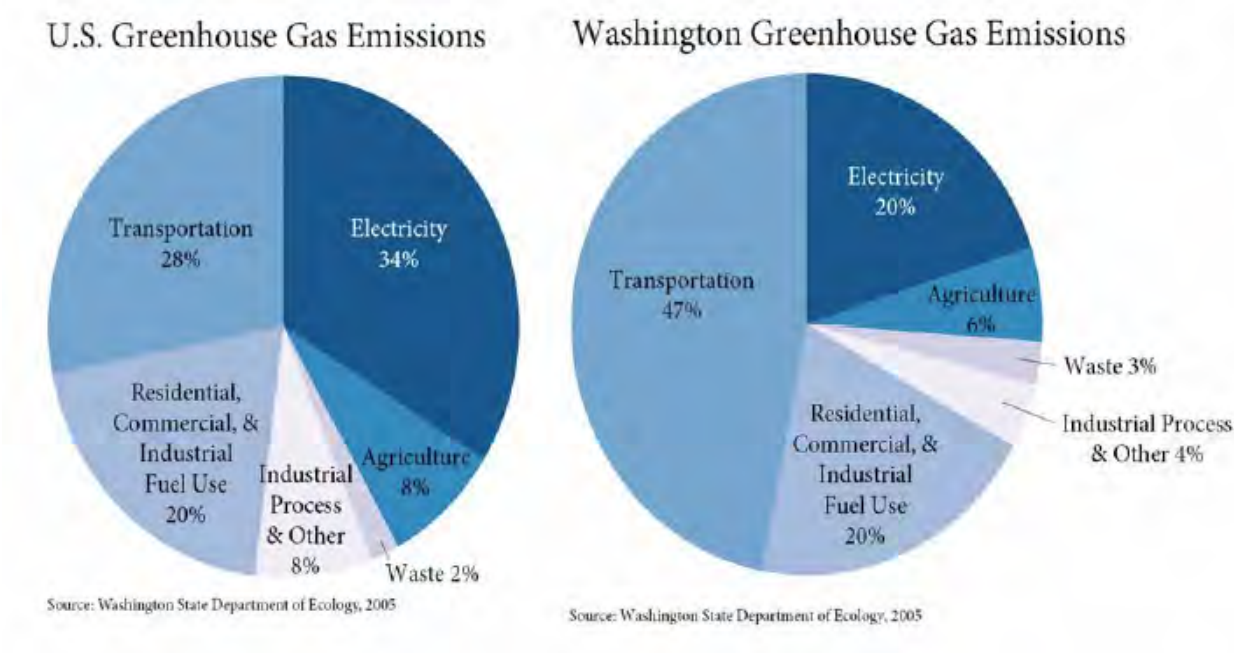


Greenhouse Gas Effect

Vehicles are a major source of GHG emissions and contribute to global warming primarily through the burning of gasoline and diesel fuels. National estimates

show that the transportation sector (including on-road, construction, airplanes, and boats) accounts for almost 30 percent of total domestic CO_2 emissions. However, in Washington State, transportation accounts for nearly half of GHG emissions because the state relies heavily on hydropower for electricity generation, unlike other states that rely on fossil fuels such as coal, petroleum, and natural gas to generate electricity. The next largest contributors to total gross GHG in Washington State are fossil fuel combustion in the residential, commercial, and industrial sectors at 20 percent; and in electricity consumption, also 20 percent. Exhibit 6-2 shows the gross GHG emissions by sector, nationally and Washington State.

Exhibit 6-2
GHG Emissions by Sector, 2005, U.S. and Washington State



What efforts are underway to reduce greenhouse gas emissions in Washington State?

In February 2007, Governor Gregoire issued Executive Order 07-02 requiring state agencies to find ways to reduce GHG emissions and adapt to the future that

climate change may create. On May 3, 2007, the Washington legislature passed Senate Bill 6001 that, among other things, adopted the Governor's climate change goals into state law. This law sets greenhouse gas reduction goals, sometimes referred to as benchmarks, for Washington State:

- 1990 greenhouse gas levels by 2020.
- 25 percent reduction below 1990 levels by 2035.
- 50 percent by 2050.

In 2007 the Climate Advisory Team was formed to carry out the Governor's executive order. The final report included recommendations of actions to reduce Washington's emissions.

The Washington legislature passed and the Governor signed HB 2815 in the Spring of 2008. This bill includes, among other elements, statewide per capita VMT reduction goals as part of the state's GHG emission reduction strategy.

In 2008, a group similar to 2007's Climate Advisory Team was established as the Climate Action Team. This group worked to refine 2007's broad recommendations into specific actions the state can take to reduce emissions. Among other items, the group focused on strategies to reduce VMT and include climate change in SEPA evaluations. More information on this statewide process is available at http://www.ecy.wa.gov/climatechange/2008CAT_overview.htm.

Vehicle Miles Traveled (VMT)

VMT stands for vehicle miles traveled and is the number of miles vehicles travel each year. For transportation projects with set boundaries, VMT can refer to the aggregate number of miles that all the vehicles travel using the specified roadways.

In addition to working in partnership with the Climate Action Team, WSDOT is working to reduce GHG emissions through other activities. WSDOT is a state leader in developing effective, measurable, and balanced emission reduction strategies. Current WSDOT activities that reduce GHG emissions include, but are not limited to:

Transportation Options: For 30 years, WSDOT has supported carpooling, vanpooling, and public transportation through the funding, building, and maintenance of the freeway HOV system, ferries, rail, and other programs. These investments help to reduce the number of vehicles on the roadway during peak congestion and help reduce total VMT.

In addition to working to reduce emissions on the transportation network, WSDOT is taking action to reduce the agency's emissions. Steps include:

No-Idle Policy: In 2006, WSDOT adopted a no-idle policy to reduce fuel use and vehicle emissions. It is estimated that by reducing vehicle idling by 50 percent, WSDOT can save as much as $500,000 annually in fuel costs.

Reducing Diesel Emissions: In 2005, WSDOT started using 5 percent biodiesel (B5) mixed with regular diesel in maintenance vehicles operating in the Central Puget Sound area. Currently, 25 WSDOT fueling stations have 10 percent biodiesel (B10) available and there is a goal toward using 20 percent biodiesel (B20), depending on availability.

In addition to the recent state activities focusing on climate change, WSDOT and its partners are actively implementing the 2005 Transportation Partnership Act, a 16-year plan to meet Washington State's most critical transportation needs. Many of the local, regional, and statewide transportation system improvements in conjunction with ongoing programs will help reduce the VMT each year. Together these efforts combine to create more efficient driving conditions, offer mode choices, and help move toward state GHG goals.

Did you know?

An average car emits one pound of carbon dioxide for every mile it is driven. So for every mile you avoid driving, you reduce the carbon dioxide added to the atmosphere by one pound.

How do we determine the effect transportation improvements have on greenhouse gas emissions?

Quantitative modeling tools to evaluate GHG emissions for linear transportation projects are limited at this time.

At the project level, WSDOT is currently unable to show the effect of improved traffic flow on emissions.

WSDOT and regional transportation planning organizations are working on methods and models to improve the quality of information and guidance for evaluating GHG emissions from transportation. Tools under development will allow for GHG calculations that account for changes in VMT and other factors, depending on project size and type in the future. Guidelines for applicable projects and how to discuss GHG emissions in a more meaningful way are also under development.

How will the SR 520 Variable Tolling Project help to reduce GHG emissions and climate change?

Since about half of the State of Washington's GHG emissions are from transportation (automobiles and trucks), reducing single-occupant vehicle trips is a good place to start. HOV lanes have been shown to encourage people to carpool, vanpool, or take the bus rather than drive by themselves. Every two-person carpool reduces the amount of GHG emissions created by that trip by about half of what it would be if both people drove. Vanpools would reduce GHGs by much more. The SR 520 Variable Tolling Project will encourage more people to use the bus and carpool, thus assisting in reducing GHG emissions and climate change. Also, since the project will improve traffic flow and increase average peak hour speeds, we anticipate that it will reduce overall energy consumption. Reducing energy use should decrease GHG emissions.

What measures will be taken to minimize cumulative effects?

No mitigation measures, beyond those already described for direct and indirect effects in Chapter 5, will be taken to minimize cumulative effects.

Chapter 7 List of Preparers and Reviewers

Name Affiliation	**Contribution**	**Education** Certifications/Licenses	**Years of Experience**
Troy Halouska Jacobs Engineering Group Inc.	Lead Environmental Task Manager, Chapters 3 and 4, Visual, and Construction	BA, Geography	10
Bob Quinlan Jacobs Engineering Group Inc.	Senior Reviewer	BS, Biology, MS, Aquatic Biology MS, Zoology and Physiology	28
Gina McAfee, AICP Jacobs Engineering Group Inc.	Chapter 2 and Cumulative	BS, Landscape Architecture American Institute of Certified Planners	31
Dana Ragusa Jacobs Engineering Group Inc.	Chapter 3, Noise, and Air Quality	BS, Environmental Studies	8
Jennifer Wolchansky Jacobs Engineering Group Inc.	Social, Land Use, Parks/Recreation, Energy, Public Services/Utilities, and Cumulative	BS, Environmental Science MS, Geography	3
Sandy Beazley Jacobs Engineering Group Inc.	Water Resources/Quality, Floodplains, Hazardous Materials, and Permits	BS, Environmental Science MS, Environmental Science	2
Robert Rutherford Jacobs Engineering Group Inc.	Review and summary of Ecology	BS, Biology	3
Kevin McDermott Jacobs Engineering Group Inc.	Economic	BS, Natural Resources Recreation and Tourism; MA, Urban and Regional Planning	5
Karen Rhea Jacobs Engineering Group Inc.	Graphic Designer	BA, Commercial Art Concentration	14
Yesenia Noriega Jacobs Engineering Group Inc.	EA Editor	BA, Business Administration	2
Ana Elias, PhD, PE, PTOE Jacobs Engineering Group Inc.	Transportation Discipline Report	Doctor of Philosophy, Civil Engineering Master of Engineering, Civil Engineering BS, Civil Engineering	18
Jamie Strausz-Clark PRR	Environmental Justice Discipline Report	Master of Public Policy	13
Paul Krueger WSDOT Environmental Manager	Lead Reviewer	BA, Art History; MLA, Landscape Architecture	12
Jennifer Charlebois, PE WSDOT Project Engineer	Reviewer	BS, Civil Engineering	8
Pete Jilek, PE FHWA Area Engineer	Reviewer	BS, Civil Engineering	10

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