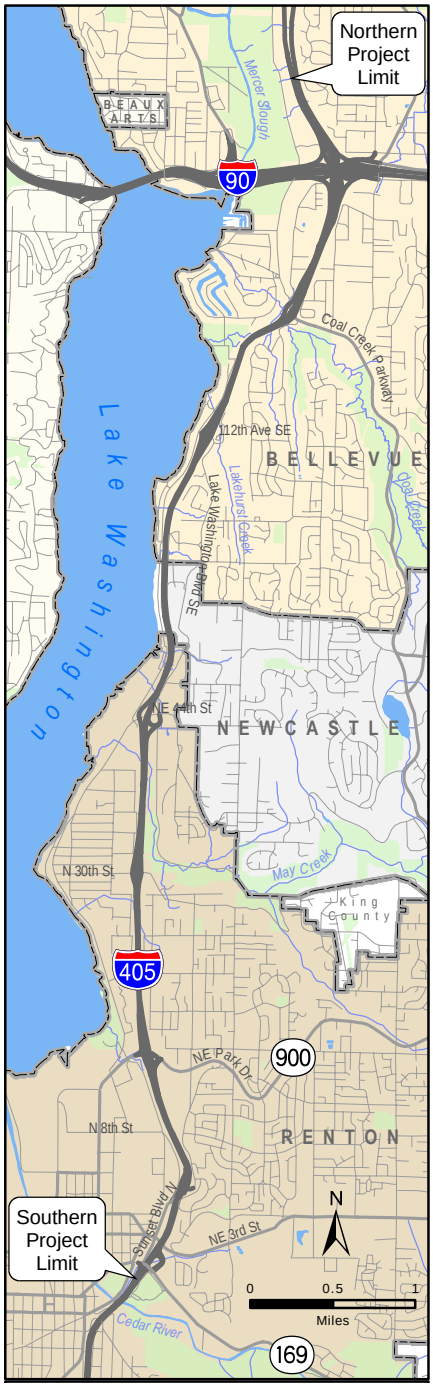
I-405 Renton to Bellevue Project
SR 169 to I-90

INTERSTATE 405 Corridor Program

Congestion Relief & Bus Rapid Transit Projects

ENVIRONMENTAL ASSESSMENT

March 2006



Washington State Department of Transportation

U.S. Department of Transportation
Federal Highway Administration

I-405, SR 169 TO 1-90 – RENTON TO BELLEVUE PROJECT

King County, Washington

Environmental Assessment

Submitted pursuant to Section 42 U.S.C. 4332 (2)(c) and 23 C.F.R. Part 771

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

2/13/06
(Date of Approval)

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

2/13/06
(Date of Approval)

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In compliance with the National Environmental Policy Act (NEPA), this Environmental Assessment (EA) describes the environmental consequences of adding two new general-purpose lanes in each direction on I-405 from SR 169 to I-90; realigning sections of I-405 to bring it up to current freeway standards; constructing a new in-line bus rapid transit station at 112th Avenue SE; constructing a high-occupancy vehicle direct-access ramp at North 8th Street; realigning and reconfiguring eight interchanges; improving stormwater treatment and discharge; and making improvements to local roadways.

Copies of this document may be purchased for $50.00, which does not exceed the cost of reproduction. Comments must be received or postmarked by April 14, 2006, and should be returned to:

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or email allison.ray@i405.wsdot.wa.gov

A public hearing on this Environmental Assessment will be held on March 22, 2006, at the Renton Senior Activity Center, 211 Burnett Avenue N, Renton, WA, from 4 PM to 7 PM.

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List of Exhibits

ACRONYMS

Acronym or Abbreviation	Meaning
AASHTO	American Association of State Highway and Transportation Officials
ACM	asbestos-containing materials
APA	aquifer protection area
APE	area of potential effects
AQMP	air quality maintenance plans
BA	biological assessment
BMPs	best management practices
BNSF	Burlington Northern Santa Fe Railway
BRT	bus rapid transit
CDA	Cultural Development Authority (of King County)
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
CSS	context sensitive solutions
CWA	Clean Water Act
DAHP	Washington State Department of Archaeology and Historic Preservation
dB	decibels
dBA	decibels in the A-weighted scale to show relative loudness of sound
EA	environmental assessment
Ecology	Washington State Department of Ecology
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
FTA	Federal Transit Administration
GMA	Growth Management Act

Acronym or Abbreviation	Meaning
GP	general-purpose
HABS	Historic American Building Survey
HAER	Historic American Engineering Records
HOT	high-occupancy toll (lanes)
HOV	high-occupancy vehicle
HPA	Hydraulic Project Approval
ITS	intelligent transportation system
LBP	lead-based paint
MP	milepost
MTCA	Model Toxics Control Act
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NMFS	National Marine Fisheries Service
NO_x	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
OHWM	ordinary high water mark
OSHA	Occupational Safety and Health Administration
PM_{10}	particulate matter
PSCAA	Puget Sound Clean Air Agency
ROD	Record of Decision
SEPA	State Environmental Policy Act
SPCC	spill prevention control and countermeasure (plan)
SR	State Route
TESC	temporary erosion and sediment control (plan)
TDM	transportation demand management

Acronym or Abbreviation	Meaning
TMP	traffic management plan
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service
UST	underground storage tank
VMT	vehicle miles traveled
WAC	Washington Administrative Code
WDFW	Washington State Department of Fish and Wildlife
WDNR	Washington State Department of Natural Resources
WRHP	Washington Register of Historic Places
WRIA	Water Resource Inventory Area
WSDOT	Washington State Department of Transportation

CHAPTER 1

Executive Summary

The I-405, SR 169 to I-90—Renton to Bellevue Project, *commonly referred to as the Renton to Bellevue Project, is part of the overall I-405 Corridor Program. The Corridor Program is the long-range mobility strategy or Master Plan for I-405. The Corridor Program is being implemented over the next twenty to thirty years in a partnership among WSDOT, the cities and counties along the corridor, and regional and federal transportation agencies. The overall improvement program balances highway, transit, and arterial projects and will offer a range of mobility options for travelers and freight movement on the I-405 Corridor.*

Where is the Renton to Bellevue Project located?

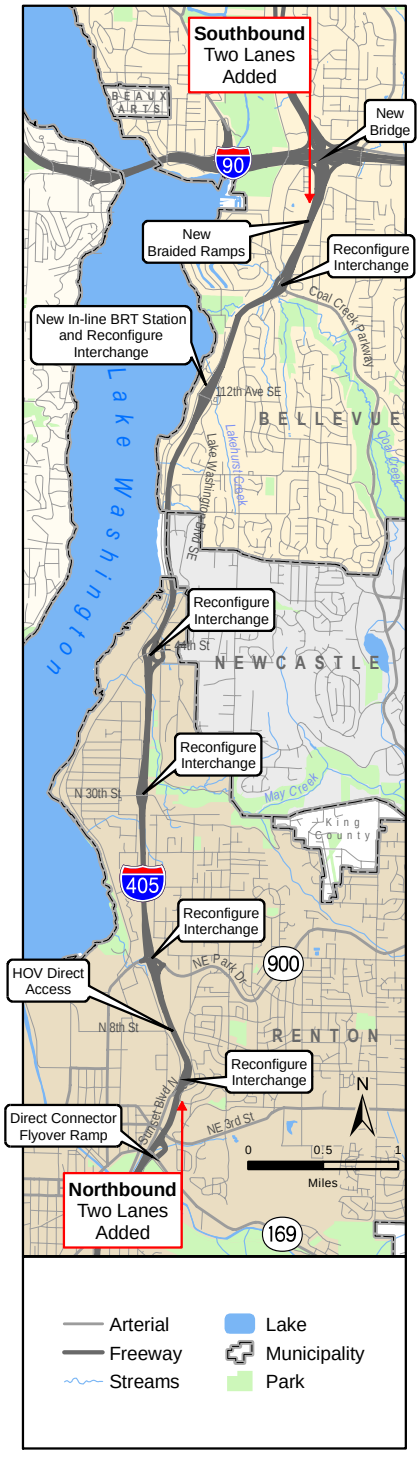
The Renton to Bellevue Project extends approximately 8 miles (milepost 3.8 to milepost 11.9) from SR 169 north to the northern on- and off-ramps of the I-90 interchange (see Exhibit 1-1).

What is the Renton to Bellevue Project?

The principal features of the Renton to Bellevue Project (also referred to as the Build Alternative) are:

- Addition of two new general-purpose lanes on I-405 in each direction from SR 169 through the I-90 interchange;
- Realignment of I-405 to bring it up to current freeway standards where feasible;
- Construction of a new in-line bus rapid transit (BRT) station in the vicinity of 112th Avenue SE;
- Construction of a transit/high-occupancy vehicle (HOV) direct access ramp at N 8th Street in coordination with Sound Transit;
- Realignment and reconfiguration of eight interchanges;
- Changes to local roadways related to interchange improvements and I-405 widening;

Exhibit 1-1: Project overview



- Construction of stormwater management facilities; and
- Application of Context Sensitive Solutions (CSS) to incorporate visual and community-oriented features into the project design.

The project description is discussed in detail in Chapter 4.

Why are we building this project?

The Renton to Bellevue Project is a part of a comprehensive strategy to reduce traffic congestion and improve mobility along the state's second-busiest highway. Project benefits include:

- Shortening periods of congestion on I-405 between Renton and Bellevue;
- Increasing transit reliability and safety with the addition of a new in-line station, direct access ramps, and other transit improvements;
- Improving operations at eight interchanges;
- Improving water quality conditions in the project area by treating approximately 290 acres of new and existing impervious surfaces;
- Providing benefits to endangered salmon species by improving water quality;
- Improving fish passage by replacing culverts or installing new fish-friendly structures on many streams within the area;
- Constructing four new noise walls and relocating five existing walls; and
- Implementing CSS design principles to improve appearance and compatibility with surrounding communities.

Springbrook Creek

Culvert in the project area

When will construction begin and how long will it take?

Construction is expected to take place in multiple construction steps, with the entire construction project lasting at least five years. WSDOT expects that during the first stage, traffic will be maintained on the current roadway while the new roadway is constructed to the outside. During subsequent steps, traffic will be shifted to the newly constructed portion so that we can remove and reconstruct the existing lanes.

How will the project affect the built environment?

Based on the analyses conducted, there will be no substantial adverse effects on the built environment as a result of the project. The following discussion highlights findings of Sections 5.1 through 5.7 of this environmental assessment:

Traffic – Although future traffic volumes will increase, traffic congestion will lessen, and there will be fewer delays with the Build Alternative. If the project is not built, the flow of traffic will become so constrained that the delays would force drivers wishing to travel on I-405 to seek alternative routes or forego some trips altogether.

Noise – For all locations that exceeded the Federal Highway Administration (FHWA) criterion of 67 dBA, we evaluated the effectiveness of noise walls to reduce the noise. Noise walls will be constructed at locations where they were found to be feasible and reasonable and are supported by the majority of local residents.

Land Use – Construction activities will temporarily affect adjacent residences, businesses, and users of the local street system because of factors such as noise and traffic delays. These temporary effects will last only as long as construction does and will not affect long-term development potential or development patterns. Some existing land uses will actually benefit as a result of transportation system improvements that provide easier access and better traffic flow.

Community, Neighborhoods, and Businesses – The project will have minor effects on communities, neighborhoods, and businesses within the project area. It is estimated that WSDOT will acquire approximately 44 acres of vacant, residential, commercial, and public property for right of way.

Environmental Justice – WSDOT examined the demographics of the study area to gain insight on the presence and needs of minority and low-income populations. Our analysis determined that the project will not have disproportionately high or adverse effects on these populations.

Recreational Resources – The project will temporarily affect Gene Coulon Park and Newcastle Beach Park during construction. Freeway widening will require that the Lake Washington Trail be realigned in several locations. In addition, partial trail closures or detours will occur during

Newport Hills Park and Ride

Renton Transit Center

construction. Approximately 10,000 square feet of Coal Creek Park will be used to widen Coal Creek Parkway.

Utility worker

Public Services and Utilities – Construction will be phased to keep access points and crossings open during construction. Temporary detours or lane closures through the construction zones are expected, causing school buses and those accessing public health and social service facilities in the area to experience minor delays. Once the project is built, the increased capacity on I-405 will benefit public services by improving access to service locations and reducing travel times for emergency vehicles.

Visual Quality – The project will result in minor changes in the visual quality experienced by I-405 users and neighbors. Freeway users will notice an increase in walls and pavement and a subsequent decrease in visual quality. Many neighbors west of I-405 look uphill toward the freeway; once project improvements are complete, these neighbors will see more of the freeway, primarily raised structures such as retaining walls, noise walls, and access ramps. Overall, visual quality will be minimally affected.

How will the project affect the natural environment?

Based on the analyses conducted, there will be no substantial adverse effects on the natural environment as a result of the project. The following discussion highlights findings of Sections 5.8 through 5.14 of this environmental assessment:

Air Quality – There will be no substantial air quality effects as a result of the Renton to Bellevue Project. The project will conform to the National Ambient Air Quality Standards (NAAQS) and the air quality maintenance plans for ozone and carbon monoxide (CO) established for the Puget Sound region. Our studies concluded that CO levels at several high volume intersections will be substantially lower than the NAAQS standard for both one-hour and eight-hour concentrations.

Water Resources – The Renton to Bellevue Project will collect and treat rainfall runoff from the new pavement as well as from the existing roadway and replaced pavement. The project will improve water quality and conveyance and reduce some localized flooding potential. Specific measures are included in the project to avoid effects to the Cedar Valley Sole Source Aquifer. Enhanced water quality treatment will be provided for the proposed 124 acres of new impervious surface, and 162

acres of presently untreated areas. Construction may cause some temporary, minor water quality effects. The project will treat approximately 176 percent of new impervious surface.

Wetlands – Approximately 0.5 acres of wetlands will be temporarily disturbed, which WSDOT will restore after construction. Construction will result in the permanent loss of 5.5 acres of wetlands. WSDOT will mitigate these displaced wetlands by creating wetland mitigation in Renton and Bellevue.

Wildlife and Vegetation – The permanent loss of approximately 130 acres of vegetation will cause some urban wildlife to move elsewhere to find available habitat. Approximately another 100 acres of vegetation will be removed during construction and replaced once construction is complete.

Ecology embankment under construction

Fish and Aquatic Resources – Project engineers have designed the Renton to Bellevue Project to avoid or minimize effects, and to provide mitigation for any unavoidable effects. As a result, the project will have no substantial adverse effects on fish or aquatic resources. By design, the Renton to Bellevue Project will have beneficial effects on the Cedar River, May Creek, Clover Creek, Coal Creek, and Gypsy Creek. The benefits include restoring fish passage, improving instream habitat, improving water quality by treating stormwater runoff, and removing existing instream obstructions such as pipes and screens.

Wooded area near May Creek

Construction activities will temporarily displace resident fish in areas when in-water construction work is necessary. However, long-term benefits will offset these temporary effects.

Geology and Soils – Construction will involve substantial earthwork, including major cuts and fills. If cut material is suitable, it will be reused in areas of the project that require fill; however, excavated soils that are unsuitable for reuse will be disposed of offsite. Effects on geology and soils in the project area can be managed using standard construction techniques. Several design and construction elements have been incorporated into the project to address landslide-prone areas located along the project alignment.

Hazardous Materials and Wastes – We identified twenty potentially-contaminated sites near I-405 for detailed analysis, including three "substantially contaminated" properties. The remaining seventeen sites are considered to be "reasonably

predictable" properties with respect to presenting a potential for the presence of hazardous materials. Because hazardous material quantities are expected to be small and contaminants are localized, they are unlikely to affect the project.

Clover Creek

Cumulative Effects – Construction effects on air quality could include temporary increases in particulate emissions. Operation of the project will be in compliance with National Ambient Air Quality Standards (NAAQS), and some measures of air quality will improve.

Cumulative effects on surface waters resulting from construction activities could include some increased runoff and increased peak flows. Cumulatively, there will be more impervious surface in the basins. However, operation of the Renton to Bellevue Project will improve water quality in the area slightly as a result of the treatment of new and existing pavement in basins where runoff currently receives little treatment. Improvements in surface water quality and stream flows in the area also may offset some minor adverse cumulative effects on wetlands.

Geologists survey alongside freeway

Minor, temporary, and long-term loss of aquatic habitat could occur as a result of the projects evaluated for cumulative effects. The Renton to Bellevue Project will minimally reduce these cumulative effects on fish and aquatic resources through provision of several fish passage improvements. Overall, cumulative effects on fish and aquatic resources are expected to be of a low magnitude.

How is this Environmental Assessment organized?

Chapters 2 and 3 of this Environmental Assessment explain why this project is needed and provide a background into the alternatives developed as part of the I-405 Corridor Program. We have also organized this document so that the affected environment, potential effects, and proposed measures to avoid or minimize effects are grouped together for individual topics in Chapter 5. A detailed description of project design features is included in Appendix A, and a glossary defining the technical terms used can be found in Appendix B. We have also included a list of project commitments in Appendix F.

We have written this Environmental Assessment in a format that is different from many that you may have read in the past. We have eliminated technical jargon and replaced scientific and engineering terms with commonly used language.

CHAPTER 2

Why do we need the project?

In 2002, the Washington State Department of Transportation (WSDOT) prepared an environmental impact statement (EIS) to provide a corridor-wide review of a range of transportation improvement alternatives along I-405. That process led to the selection of an alternative that became the I-405 Corridor Program. The Renton to Bellevue Project proposes a focused strategy to improve the section of the corridor beginning at SR 169 and continuing through the northern on- and off-ramps of the I-90 interchange.

Typical traffic in the project area

Why do we need the Renton to Bellevue Project?

Our region needs the Renton to Bellevue Project to improve personal and freight mobility and to reduce traffic congestion in ways that are safe and reliable. Anyone who has traveled on I-405 through the project area already knows how congested this stretch of road has become. On an average morning, motorists and transit users currently experience northbound traffic congestion between 6:00 and 9:00 AM. The typical northbound morning peak hour has between 4,100 and 5,500 vehicles. Likewise, on a typical afternoon, motorists and transit users experience traffic congestion heading southbound beginning by 3:00 PM and lasting for several hours. Currently, the southbound evening traffic congestion is slightly less than northbound morning congestion. The freeway carries up to 5,000 vehicles in each direction during the evening peak hour.

What is congestion?

Congestion occurs when vehicles on the freeway move at an average speed of 45 miles per hour or less, and the flow of traffic is often stop and go.

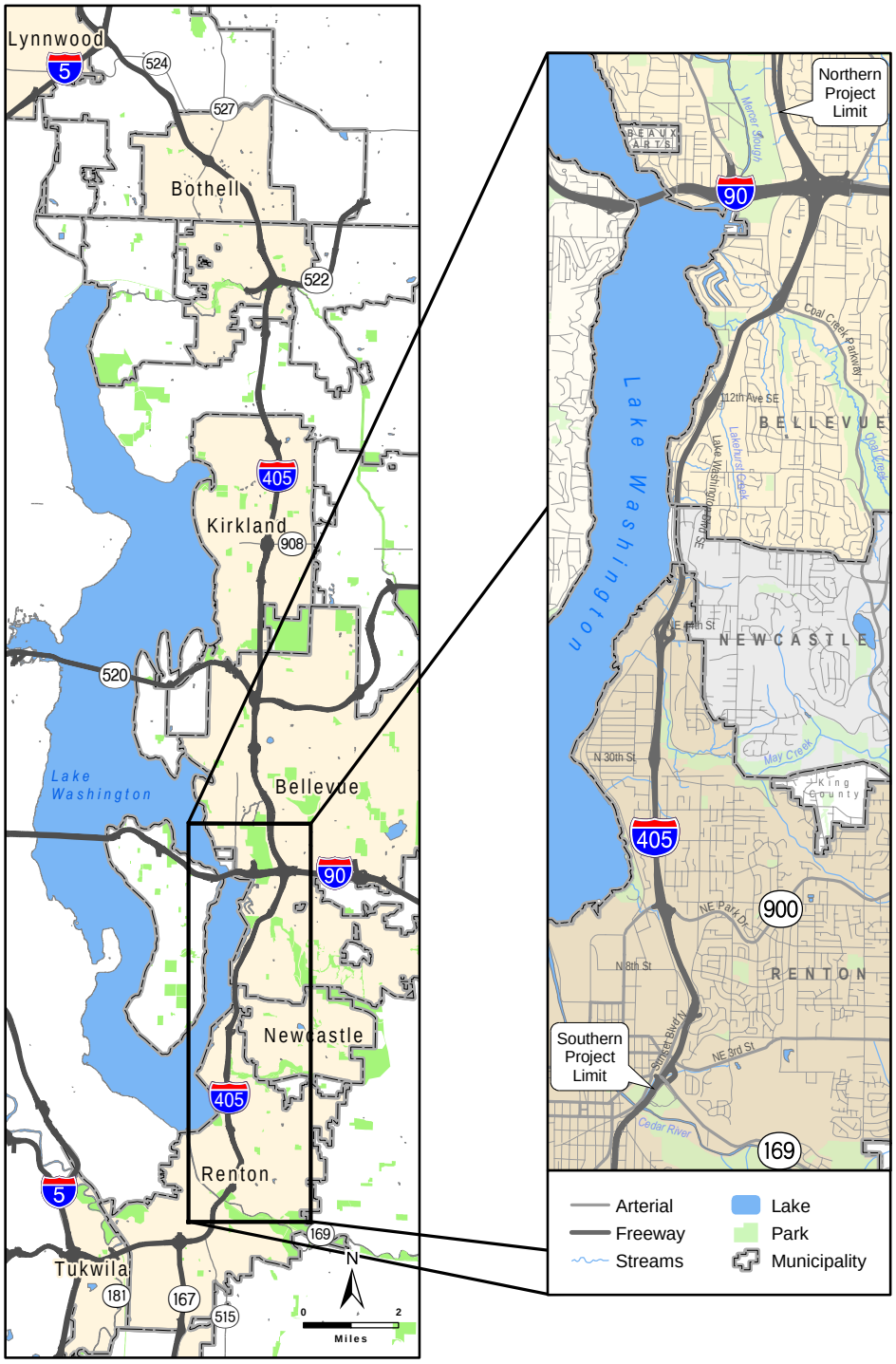
What is the I-405 Corridor Program and how does the Renton to Bellevue Project fit in?

The I-405 Corridor Program was created as a comprehensive strategy to reduce congestion and improve mobility throughout the corridor, which begins at the I-5 interchange in the City of Tukwila and extends northward 30 miles to the I-5 interchange in Lynnwood. Its overall purpose is to help to create an efficient, integrated, and multimodal system of transportation solutions that:

Where is the Renton to Bellevue Project area?

The Renton to Bellevue Project extends along I-405 for approximately eight miles (milepost 3.8 to milepost 11.9) from SR 169 through the northern on- and off-ramps of the I-90 interchange.

Exhibit 2-1: Project vicinity



- Maintain or enhance livable communities within the corridor;
- Maintain or improve air quality, protect or enhance fish-bearing streams, and promote regional environmental values such as continued integrity of the natural environment;
- Support a vigorous state and regional economy by responding to existing and future travel needs; and
- Accommodate planned regional growth.

The Renton to Bellevue Project is part of the I-405 Corridor Program that proposes to make several major roadway, structural, and transit improvements from SR 169 to the I-90 interchange (see Exhibit 2-1; see also Exhibit 4-2 in Chapter 4).

What happens if the Renton to Bellevue Project is not built?

On a typical weekday, 135,000 vehicles currently travel along the I-405 Corridor in the study area. Half of them travel northbound and half travel southbound. After the project is constructed, our traffic models predict that 188,000 vehicles will travel along this section of the I-405 Corridor in 2014; 212,000 vehicles will travel this section in 2030. If the project is not built, the flow of traffic would be constrained, which means delays would become so great that 42,000 drivers would decide not to use I-405. These drivers would seek alternative routes on the limited number of local and regional roadways, leading to increased cut-through traffic causing additional congestion on those routes, or they may choose to travel by different modes, or forego their trips entirely.

What other improvements are being implemented as part of the region's transportation plans?

WSDOT included improvements along I-405, as well as those on SR 520, I-90, and SR 522, in its *Highway System Plan* (WSDOT, May 18, 2004), which forecasts transportation needs for the next 20 years. *Destination 2030* (Puget Sound Regional Council [PSRC], May 24, 2001; revised May 22, 2003) is the Metropolitan Transportation Plan for the Central Puget Sound region and defines the transportation action plan for the next 30 years. The Renton to Bellevue Project is included in *Destination 2030* and is also consistent with the transportation plans for the cities of Renton and Bellevue.

CHAPTER 3

Developing the Alternatives

The I-405 Corridor Program Environmental Impact Statement (EIS) analyzed a wide range of alternatives and travel modes for moving people and freight, reducing congestion in the corridor, as well as mitigation measures to avoid or reduce adverse effects.

The Renton to Bellevue Project extends along I-405 for approximately 8 miles (milepost 3.8 to milepost 11.9) from SR 169 through the northern on- and off-ramps of the I-90 interchange. This environmental assessment is a focused, project-specific environmental review of two alternatives—the Build Alternative and the No Build Alternative.

How did WSDOT move forward from the I-405 Corridor Program to the Renton to Bellevue Project?

In the I-405 Corridor Program Draft EIS, decision-makers considered various modes of travel for making improvements within the corridor. The range of options evaluated included general-purpose travel, carpools, transit, and rail; general locations for improvements; and how combinations of improvements could work together as a comprehensive system. The I-405 Corridor Program environmental process, shown at the right, shows the milestones that we have achieved.

Preferred Alternative

Once we completed the Draft EIS, we recommended a *Preferred Alternative* for analysis in the Final EIS. The *Preferred Alternative* was a compilation of highway, transit, local arterial, and other improvements within the 30-mile stretch of the I-405 Corridor and immediate vicinity. The details of the *Preferred Alternative* were

THE I-405 CORRIDOR PROGRAM ENVIRONMENTAL PROCESS

Discipline Reports

A set of technical reports describing the natural and built environment that evaluate alternative methods for project design, construction, and operation. Each discipline report describes the topic's affected environment, effects of the proposed actions, and how effects will be avoided, minimized, or mitigated.

NEPA/SEPA Environmental Impact Statement

Identified the environmental effects of the proposed action and other alternatives proposed for the I-405 Corridor Program

Preferred Alternative

The alternative selected from among five analyzed in the EIS. The details of the Preferred Alternative analysis, as well as that of the other alternatives and responses to public and agency comments are included in the Final EIS.

Selected Alternative

The alternative selected and approved by FHWA and FTA as documented in the Record of Decision.

Record of Decision

The final step in the EIS process. A concise document that identifies the decision (Selected Alternative), and mitigation measures adopted for the Selected Alternative.

Renton to Bellevue Project

A specific set of project improvements contained in the Selected Alternative that focuses on the Renton to Bellevue section of the I-405 Corridor.

included in the Final EIS, along with the analyses of five other alternatives.

Selected Alternative

With some modifications, the *Preferred Alternative* in the Final EIS became the *Selected Alternative* in the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) Record of Decision (ROD). The ROD identified the basis for the decision to advance the *Selected Alternative*, and explained the adopted means to avoid, minimize, and compensate for environmental effects.

In both the EIS and the ROD, WSDOT specified that the improvements cited in the *Selected Alternative* would be re-examined prior to implementation to determine the best combinations for phased construction. WSDOT continues to examine these recommendations within the constraints of the available budget while maintaining sound engineering design.

It is expected to take 20 years or more to implement the *Selected Alternative* for the entire I-405 Corridor Program. As a result of the 2005 Transportation Partnership Account passed by the Legislature, the I-405 Corridor Program received $972 million in state funds to construct highway improvements addressing congestion chokepoints in Tukwila, Renton, Bellevue, Kirkland, and Bothell. Combined with the $485 million in the 2003 Nickel funding package, this new revenue will help to improve mobility to an even larger extent through the I-405 Corridor.

How was the Renton to Bellevue Project developed?

Using the *Selected Alternative* as the master plan, WSDOT developed congestion relief roadway improvements and began to define the Renton to Bellevue Project with the following features in mind:

- Improving the worst congestion choke points[1] along I-405;
- Reconstructing and reconfiguring eight interchanges;
- Improving safety;
- Increasing travel speeds during peak commuter hours;

[1] An area of highway with inadequate capacity or a point or area of traffic congestion.

- Facilitating freight movement;
- Implementing meaningful environmental improvements; and
- Providing a return benefit of several times the investment costs through reduced travel time, and increased freight speeds.

Throughout the planning process, WSDOT incorporated many revisions into the project. For example, WSDOT added two lanes in each direction throughout this section of roadway to provide traffic relief for one of the corridor's worst bottlenecks. Additionally, we conducted reviews to ensure that methods to avoid or minimize potential effects were evaluated and incorporated into the project. The environmental review process for the Renton to Bellevue Project will be completed in three primary stages (shown to the right).

In 2003, the City of Renton partnered with WSDOT to keep the Renton to Bellevue Project moving forward by designating a $5-million federal grant award for this section of the I-405 Corridor. The grant funding allowed footprint engineering and the environmental studies to begin.

THE RENTON TO BELLEVUE PROJECT ENVIRONMENTAL PROCESS

Discipline Reports

Each of the 21 discipline reports describes the topic's affected environment, effects of the proposed action, and how effects will be avoided, minimized, or mitigated.

Environmental Assessment

A concise document prepared in compliance with NEPA that briefly discusses the purpose and need for an action, alternatives to the action, and provides sufficient evidence and analysis of impacts to determine whether to prepare an EIS or a Finding of No Significant Impact (FONSI).

F O N S I

A FONSI presents the reasons why an action will not have a significant effect on the environment and, therefore, does not require the preparation of an EIS. Based on analyses and project feedback received to date, we anticipate preparing a FONSI for the Renton to Bellevue Project.

What alternatives are studied in this Environmental Assessment?

WSDOT evaluates two alternatives in this EA:

- A **No Build Alternative**, which would maintain the status quo, meaning only routine activities such as road maintenance, repair, and minor safety improvements necessary for continued operations of the existing I-405 facility would take place over the next 20 years. This alternative does not include improvements that would increase roadway capacity on I-405, reduce congestion, or improve safety. Therefore, the No Build Alternative does not satisfy the project's purpose.
- A **Build Alternative**, which will add two northbound and two southbound lanes to the Renton to Bellevue section from SR 169 to I-90; realign sections of I-405 to bring it up to current freeway standards; construct a new in-line bus rapid transit (BRT) station at 112th Avenue SE; construct a high-occupancy vehicle (HOV)

direct-access ramp at North 8th Street; realign and reconfigure eight interchanges; improve stormwater treatment; and make improvements to local roadways.

The description of the Build Alternative is presented in Chapter 4. A more detailed project description is found in Appendix A.

What environmental issues influenced project design?

Throughout the development of the Renton to Bellevue Project, WSDOT continues to identify design refinements to avoid or minimize effects to the environment. For example, proposed construction and stormwater treatment areas have been modified several times to limit contact with streams and wetlands. In some situations, retaining walls around culverts (headwalls) will be installed on culverts to avoid encroachment into streams and surrounding areas.

Project scoping meeting
September 17, 2003

The purpose of scoping is to:

- Inform the public and agencies of proposed actions and alternatives;
- Serve as a forum to gather comments to help identify potential environmental effects;
- Ensure that the environmental documents consider reasonable alternatives; and
- Help identify issues or concerns important to the local community and to agencies.

What is the objective of this Environmental Assessment?

This EA offers a detailed evaluation of the effects that can occur as a result of this project. Using this evaluation, FHWA and WSDOT will determine whether an EIS or a Finding of No Significant Impact (FONSI) will be prepared. The EA does not re-examine corridor-level alternatives, effects, or other measures that were already analyzed and resolved in the Corridor Program EIS.

How has the public been involved?

WSDOT has involved the public in the Renton to Bellevue Project through a wide range of activities such as:

- Inviting citizens to participate in the project scoping and development process;
- Conducting public open houses, producing newsletters with project information, presentations at neighborhood meetings, etc.;
- Providing other outreach efforts such as Executive, Steering, and Advisory committee meetings;
- Responding to individual correspondence by telephone, email, and in person;
- Holding a discipline report meeting to present preliminary findings; and

- Holding a public meeting and hearing on this environmental assessment.

Project Scoping and Development

On August 22, 2003, WSDOT met with cities and agencies that have jurisdiction in the project area to identify and incorporate their concerns and comments. More than 75 citizens attended the Renton to Bellevue Project scoping meeting on September 17, 2003. They were invited to submit written and verbal comments to WSDOT during a public comment period.

Following these meetings, WSDOT categorized and compiled the comments into the Renton to Bellevue Project Scoping Report. The comments addressed topics such as noise, parks, water quality, stormwater management, and the purpose and need for the project (see Exhibit 3-1). Throughout the environmental assessment process, WSDOT has actively communicated with citizens through letters, emails, in-person meetings, and phone conversations.

Renton to Bellevue Project Outreach

Renton to Bellevue Charette:
August 19, 2002

Scoping Meeting with Resource Agencies and Jurisdictions:
August 22, 2003

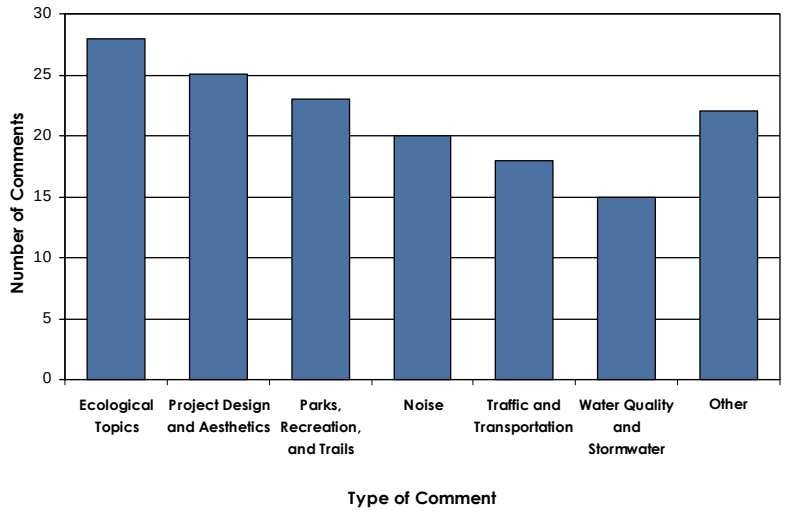
Public Scoping and Open House:
September 17, 2003

Neighborhood Meetings:
Ongoing

Renton to Bellevue Project Open House
December 8, 2005

EA Public Hearing
March 22, 2006

Exhibit 3-1: Public scoping comments



Public Outreach

Public outreach for the Renton to Bellevue Project has been ongoing since 1999, when scoping for the I-405 Corridor Program EIS began. The corridor public involvement program included a large (40 members) community advisory committee (I-405 Corridor Program Citizens Committee) representing a wide range of interests and backgrounds throughout the corridor, a media outreach program, public meetings, project

newsletters, electronic newsletters, a project web site, and a speakers bureau to make presentations to the large number of community organizations in the corridor.

WSDOT developed a public involvement plan to support the Renton to Bellevue EA, with goals to:

- Support the successful delivery of the project;
- Communicate with the public about the mobility, economic, and environmental benefits of the project;
- Identify and address any disproportionately high and adverse impacts on minority, low-income and non-English-speaking populations;
- Provide construction information;
- Reinforce positive relationships with other agencies, individuals, and groups; and
- Communicate the need, vision, and context for the project.

In early 2004, preparation of the Renton to Bellevue EA was temporarily put on hold as the project team turned its focus to completing the funded "Nickel Project" EAs in Kirkland, Bellevue, and Renton. During this time, some of the targeted outreach slowed down as well. The Renton to Bellevue Project engineering team continued to work toward completing the project's preliminary design, and the public involvement team maintained contact with area residents through phone calls, email correspondence, and neighborhood meetings.

In March of 2005, the Renton to Bellevue Project was restarted. With the project's renewed schedule, the project team visited more neighborhoods in 2005. A major concern for most neighborhood residents along I-405 is noise. When noise analyses were completed for the Renton to Bellevue Project, WSDOT scheduled special noise meetings with neighborhoods.

To date, the project team has communicated with the following neighborhoods:

2003-2004:

- Kennydale in Renton
- North Renton in Renton

2005:

- Bellemont in Bellevue
- Kennydale (re-visit)
- North Renton (re-visit)
- Highbury Park in Renton
- Highlands in Renton
- Liberty Ridge in Renton
- Monterey Terrace in Renton
- Factoria in Bellevue
- Newport in Bellevue
- Somerset in Bellevue
- Neighborhoods in Newcastle

What special efforts have been made to reach minority, low-income, and non-English-speaking individuals?

By implementing a comprehensive outreach plan, the public involvement team conducted extensive outreach efforts to minority, low-income, and non-English-speaking populations in the Renton to Bellevue project area. The team contacted civic agencies and private organizations to identify and locate these communities and learn about their needs. The public involvement team contacted the following organizations in an effort to keep traditionally hard-to-reach communities informed of project plans and progress:

Agencies:

- Bellevue Multicultural Fair
- Bellevue World Impact Food Bank
- City of Bellevue Human Services
- City of Kent Housing and Human Services
- East King County Catholic Community Services
- Eastgate Health Clinic
- HopeLink
- King County Housing Authority
- Renton Clothing Bank
- Renton Food Bank

How WSDOT communicates with the public:

Speaker's Bureau – Formal presentations by WSDOT personnel to community organizations.

Environmental Outreach – Field studies put I-405 environmental team members in touch with neighbors. For example, WSDOT contacted agencies who provide services to low-income and minority populations to discuss the project and how it could affect their services.

Project Website – The I-405 Project Team Website, at www.wsdot.wa.gov/projects/I-405 is designed as a resource for the public, and has been updated regularly.

Newsletters/Project Updates – Newsletter mailings and email updates offer an ideal opportunity to inform the public on project progress.

Return Mail Postcard – Mailings included a return postcard offering an opportunity to comment on the project and to request a visit by I-405 Project Team members at organization meetings. Individual postcards were distributed to libraries, multi-family apartment/ condominium associations, and special housing establishments.

- Renton Housing Authority
- Renton School District
- Renton Technical College
- Seattle Human Services
- South County YWCA
- South King County Family Services
- South King County Salvation Army
- St. Anthony's Catholic Church, Renton
- Ukrainian Community Center

Residential:

- Heritage Grove Apartments
- Royal Hill Apartments
- Summer Wind Community
- Sunset Terrace (RHA Property)

In the Renton to Bellevue project area, one of the primary concerns is the impact of construction. For example, most of the minority and low-income populations within the study area rely on transit facilities for daily needs such as education, employment, childcare, and healthcare, among others. Because of this reliance, these individuals must deal with delays and other challenges from the current inefficiencies of I-405. Additional effects on transit and interruptions in service on I-405 during construction are a big concern. Additional targeted outreach and the provision of alternative travel opportunities (such as increased bus or traffic demand management [TDM] options) may be necessary to ensure these populations will not be disproportionately affected from the construction activities.

In what other ways has the public been involved?

Several standing committees meet regularly to provide ongoing dialogue and coordination for the Renton to Bellevue Project. These groups include:

- Briefings with the Renton City Council, the Renton Transportation Committee, and the Mayor;
- Meetings with City of Bellevue staff to coordinate project activities;

- The I-405 Executive Committee, comprised of executives from FHWA, Federal Transit Administration (FTA), WSDOT, King County, and Sound Transit, as well as members of the Washington State Transportation Commission and elected officials from cities along the I-405 Corridor, provide input on policy matters; and
- The I-405 Steering Committee, comprised of senior staff from the local, regional, state, and federal agencies having jurisdiction within the Renton to Bellevue Project area, provides technical and policy guidance. The Steering Committee meets to provide feedback on technical feasibility, environmental acceptability, costs, and performance.

In addition to the outreach described above, the following outreach is being conducted throughout the duration of the project:

- A corridor-wide newsletter is distributed via email;
- A project brochure (or "folio") tells the I-405 story, while fact sheets on frequently asked questions target specific areas of interest;
- Affected property owners are briefed throughout the project by one-on-one meetings, citizen group meetings;
- The media is informed through press releases and press kits, meetings with reporters, and editorial board briefings;
- A Renton to Bellevue Project website provides information on public involvement opportunities, funding, benefits, timeline, etc.; and
- A Speakers Bureau consisting of I-405 project team staff meets with civic organizations in the area to brief members on project progress and to answer questions.

How have government agencies been involved?

Government agencies have played major roles in the development of the Renton to Bellevue Project. WSDOT involves governmental agencies by conducting meetings to address issues on an as-needed basis. Examples of these methods are:

- Congressional and legislative briefings were conducted in 2004 and 2005. Washington State legislators within the I-405 Corridor study area and U.S. Congress members from the Washington State delegation received project updates;
- Scoping meetings with agencies to discuss traffic, air, noise, endangered species, water, wetlands, and mitigation strategies;
- Steering Committee meetings; and
- Regular meetings with the cities of Renton and Bellevue staffs.

How have we involved tribal governments in the project?

Tribal governments can help identify social issues and solutions that may affect tribal members or other social resources of interest to the tribes. WSDOT commits itself to respectful, effective consultation and communication with tribal governments in recognition that project activities may affect their rights and interests. WSDOT Executive Order E1025.00 on Tribal Consultation (February 19, 2003) established this commitment to an effective working relationship with tribal governments.

WSDOT initiated consultation with the following tribal governments during preparation of the I-405 Corridor Program EIS: Muckleshoot Tribe, Confederated Tribes and Bands of the Yakama Nation, Snoqualmie Tribe, and Duwamish Tribe. The consultation continues as part of the Renton to Bellevue Project and will help to involve tribal governments in each stage of the environmental analysis. To date, tribal representative have participated in the Renton to Bellevue Project by attending project scoping meetings, site visits, participating in public outreach efforts, and meetings with WSDOT to discuss issues of interest.

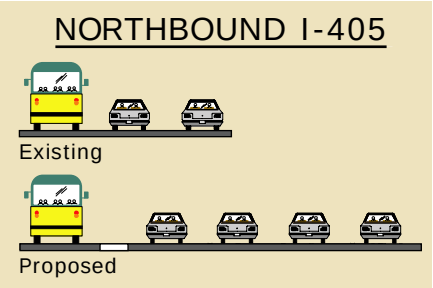
What future public outreach is planned for the Renton to Bellevue Project?

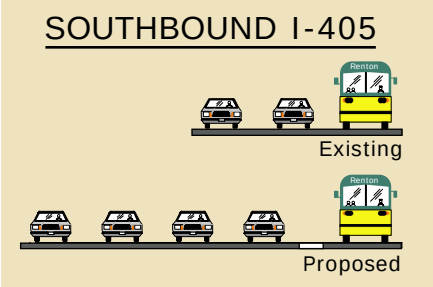
An Open House was held on December 8, 2005, to share early findings from the environmental discipline reports. A public meeting and hearing on the EA will be held on March 22, 2006, at the Renton Senior Activity Center, 211 Burnett Avenue N, Renton, from 4 PM to 7 PM.

CHAPTER 4

Description of the Project

The I-405, SR 169 to I-90, Renton to Bellevue Project is being designed to add bus rapid transit (BRT) facilities, make substantial lane and interchange improvements, and improve stormwater management throughout an 8-mile section of I-405 from SR 169 north to the northern on- and off-ramps of the I-90 interchange. This project description provides an overview of the project's principal features as well as other features that are necessary to support these improvements.





What are the principal features of the Renton to Bellevue Project?

The Renton to Bellevue Project extends approximately 8 miles (milepost 3.8 to milepost 11.9) from SR 169 north to the northern on- and off-ramps of the I-90 interchange (Exhibit 4-1). The principal features of the Build Alternative are (See Exhibit 4-2):

- Addition of two new general-purpose lanes on I-405 in each direction from SR 169 through the I-90 interchange;
- Realignment of I-405 to bring it up to current freeway standards where feasible;
- Construction of a new in-line BRT station in the vicinity of 112th Avenue SE;
- Construction of a transit/high occupancy vehicle (HOV) direct access ramp at N 8th Street in coordination with Sound Transit;
- Realignment and reconfiguration of eight interchanges;
- Changes to local roadways related to interchange improvements and I-405 widening;
- Construction of stormwater management facilities; and

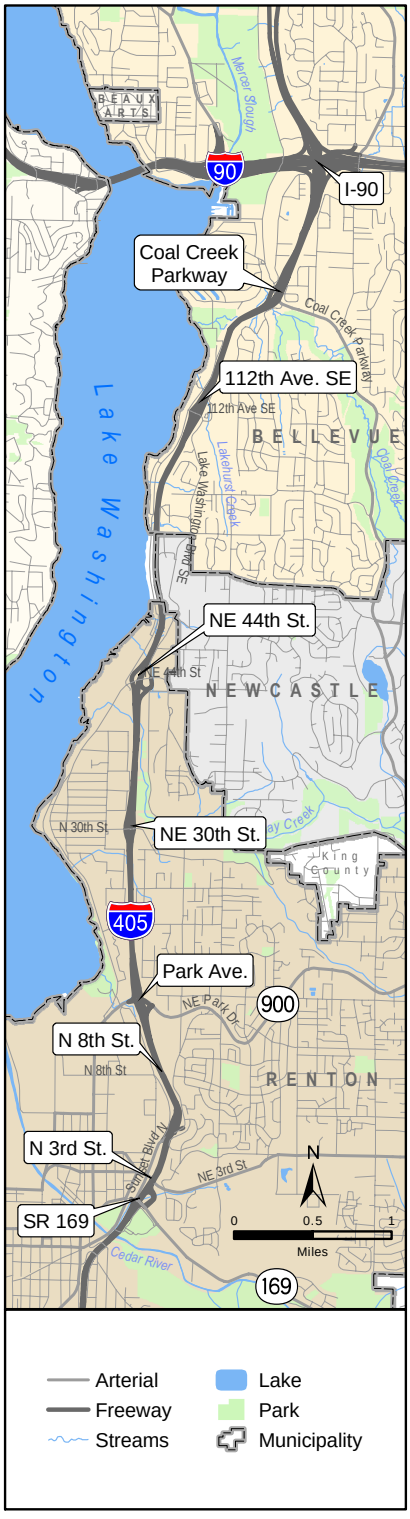
What are general-purpose lanes?

General-purpose travel lanes are lanes available to all traffic.

What are high-occupancy vehicle lanes?

High-occupancy vehicle lanes, or HOV lanes, are designed to carry a specified minimum number of passengers, such as an automobile carrying more than one person. HOV lane users include carpools and vanpools, as well as buses, motorcycles, emergency vehicles, and trucks under three axles.

Exhibit 4-1: Project interchanges



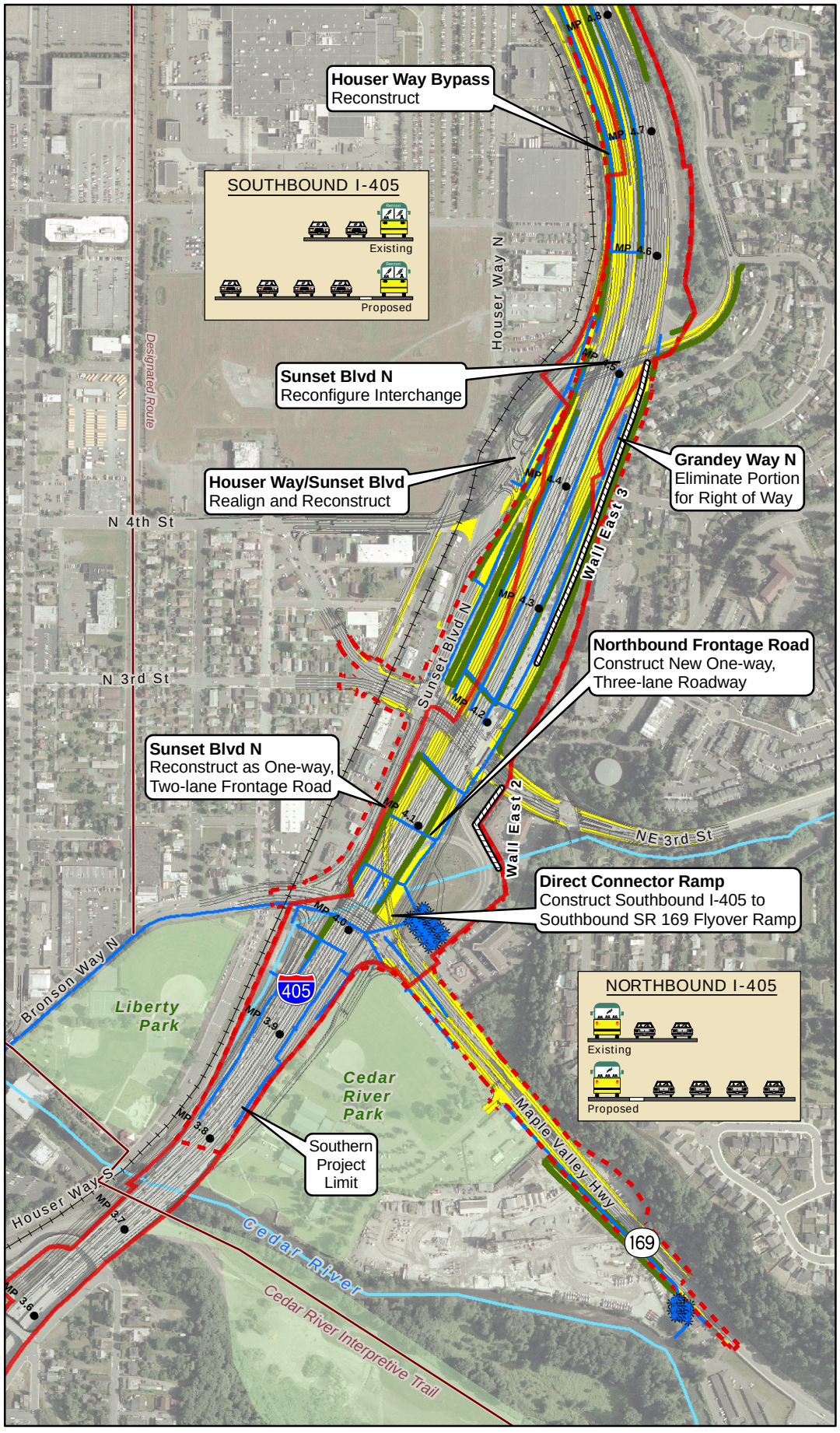
- Application of Context Sensitive Solutions (CSS) to incorporate visually-pleasing and community-oriented features into the project design.

What benefits will the project provide?

The Renton to Bellevue Project will provide many short- and long-term benefits. Some of these benefits are:

- Shortening periods of congestion on I-405 between Renton and Bellevue;
- Increasing transit reliability and safety with the addition of a new in-line station, direct access ramps, and other transit improvements;
- Improving operations at eight interchanges;
- Improving water quality conditions in the project area by treating approximately 290 acres of new and existing impervious surfaces;
- Providing benefits to threatened salmon species by improving water quality;
- Improving fish passage by installing fish-friendly culverts or structures beneficial to fish on several streams within the area;
- Constructing four new noise walls and relocating five existing noise walls to the edge of right of way; and
- Implementing CSS design principles to improve project appearance.

The design and construction contract will include many provisions to protect the environment and to ensure compliance with project-specific permit conditions and project commitments.



Legend

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- Lane Striping
- Proposed Retaining Wall
- Proposed New Noise Wall
- Relocated Noise Wall
- Proposed Stormwater Conveyance
- Proposed Water Treatment Facility
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- Railroad
- Existing Right of Way
- Proposed Right of Way
- Stream or Natural Drainage
- New Lanes and Shoulders
- Park
- Municipality

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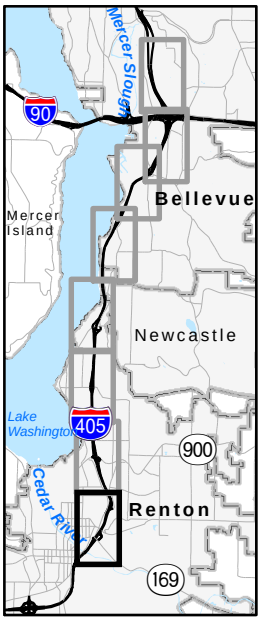

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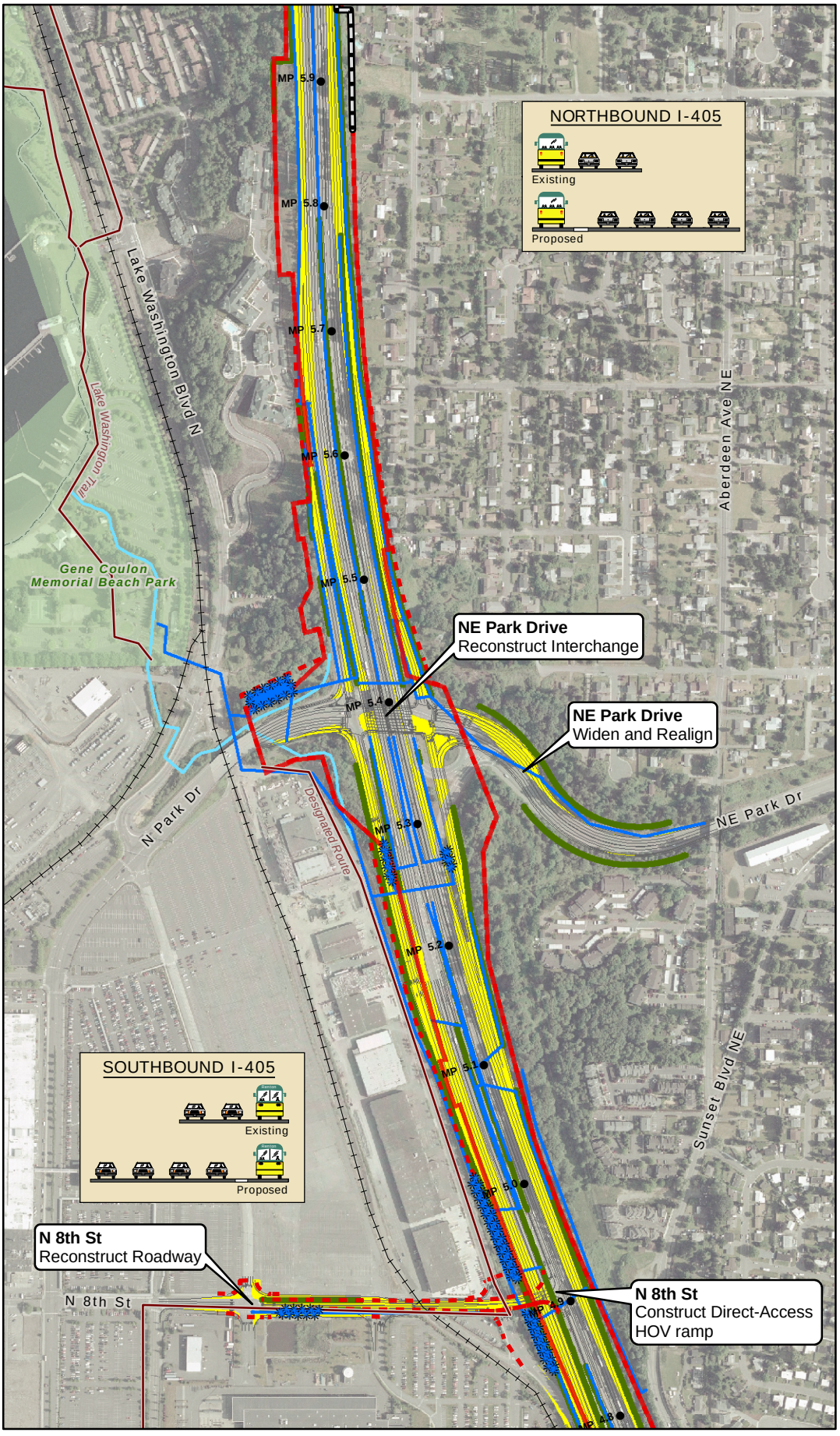
Renton to Bellevue Project Proposed Improvements

EXHIBIT 4-2 | SHEET 1 of 8



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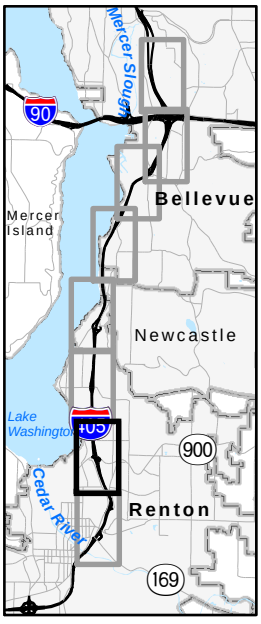

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Renton to Bellevue Project Proposed Improvements

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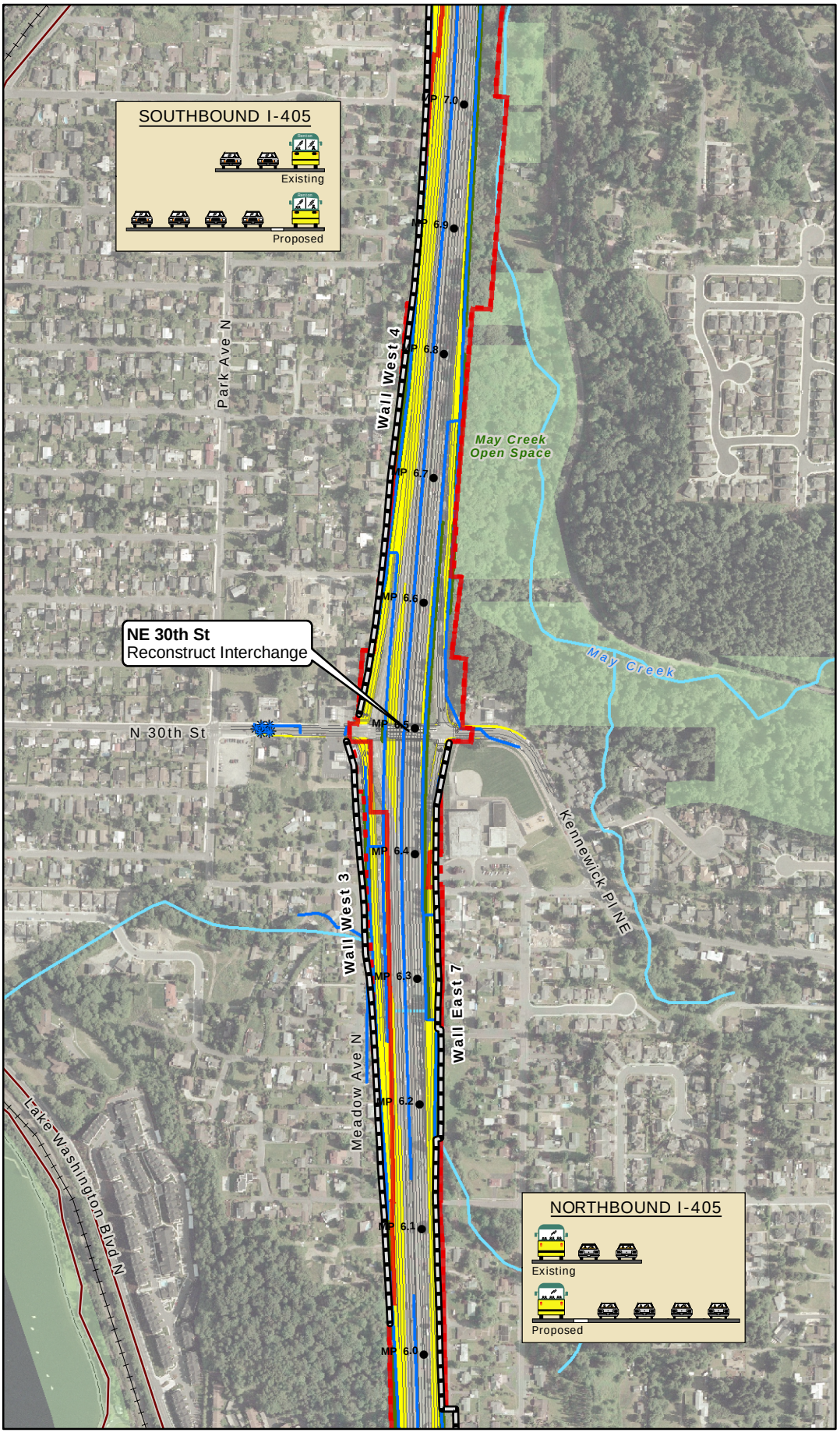

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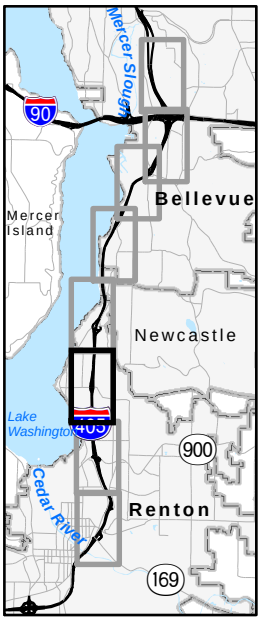

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Renton to Bellevue Project Proposed Improvements

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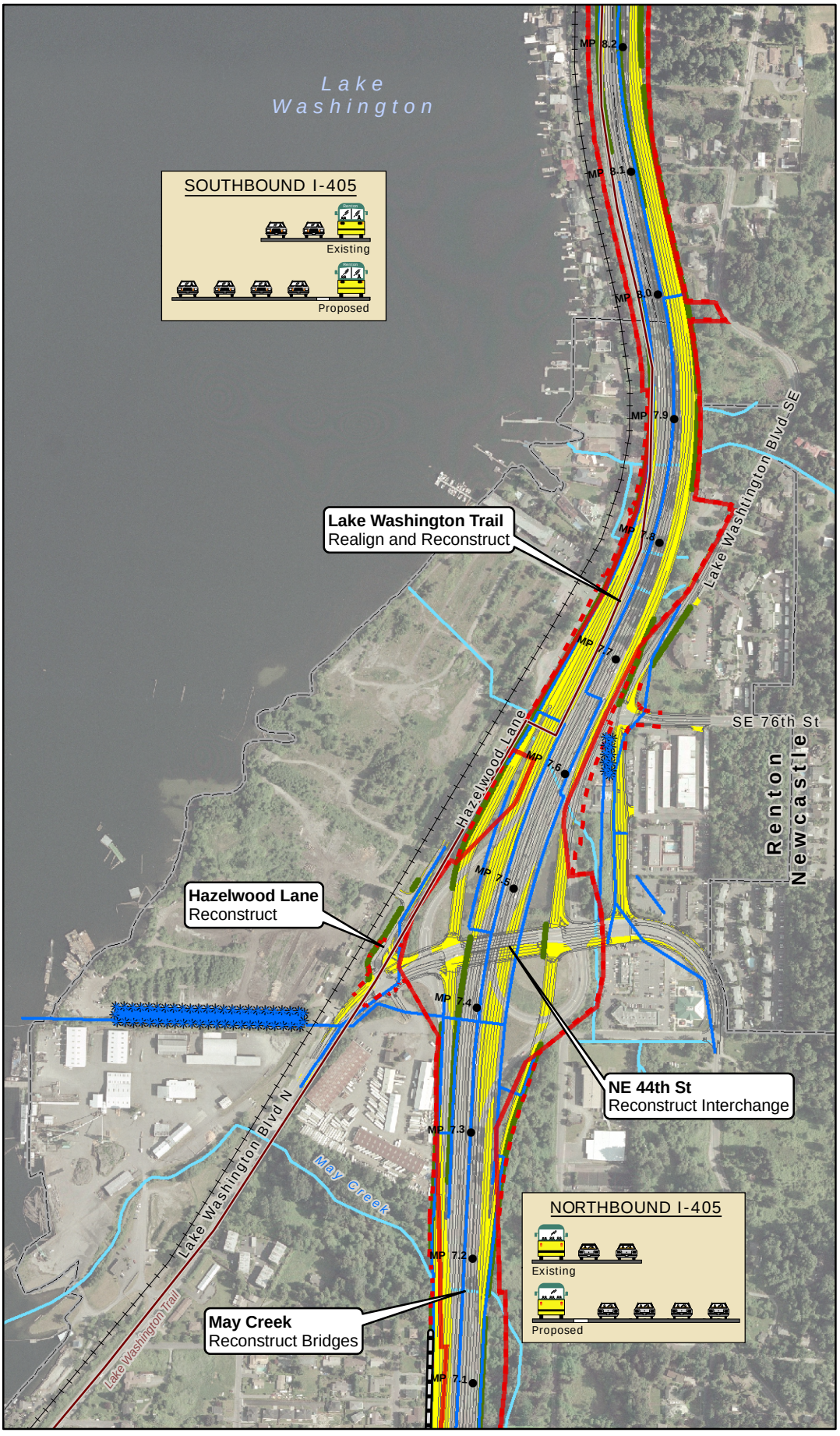

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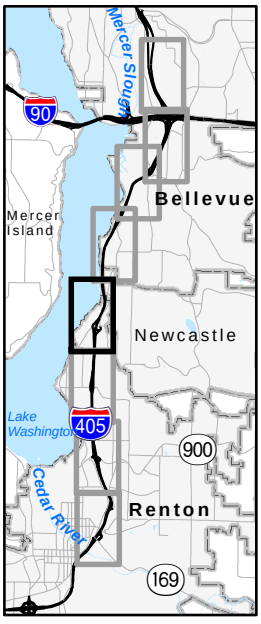

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Renton to Bellevue Project Proposed Improvements

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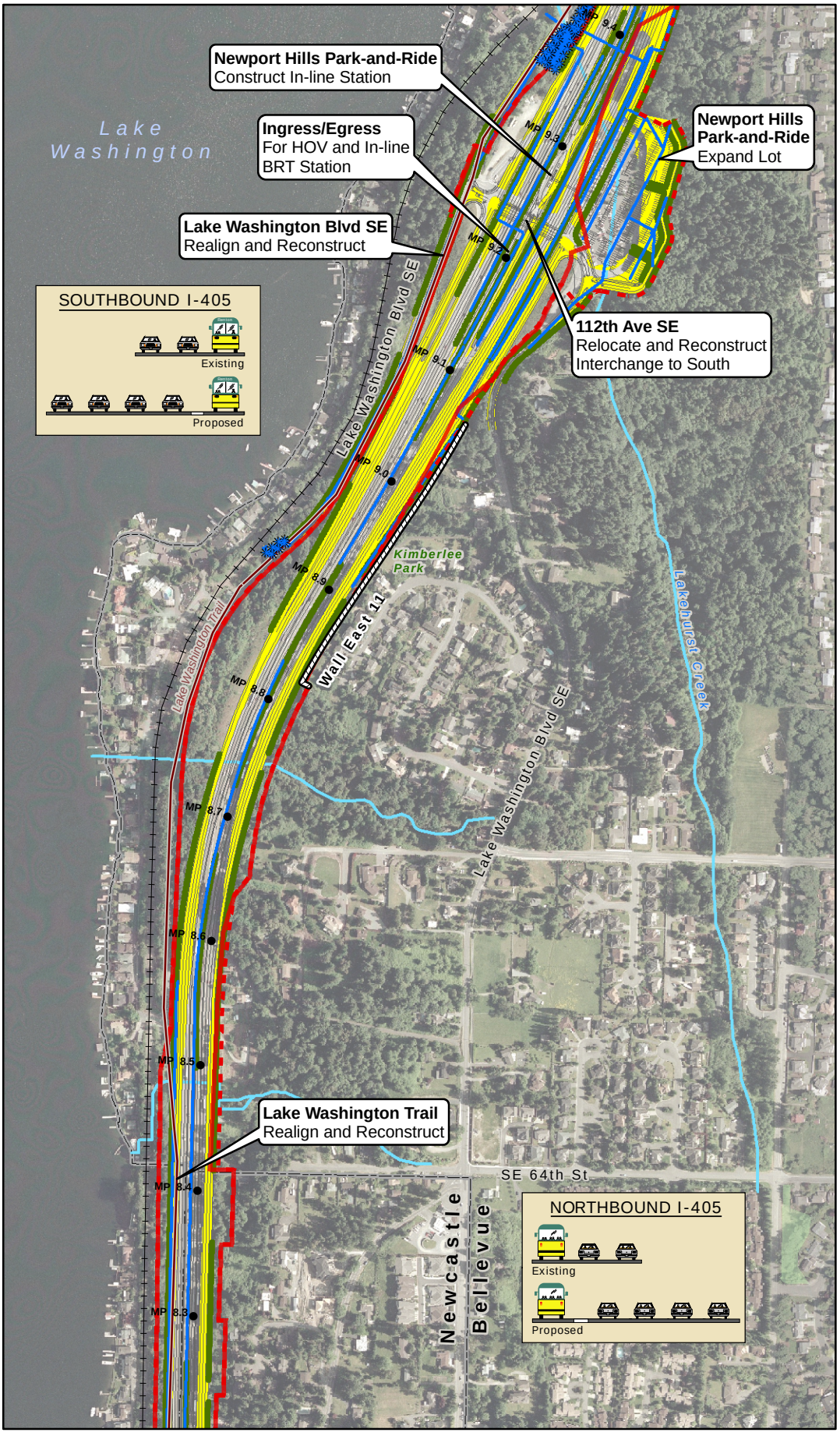

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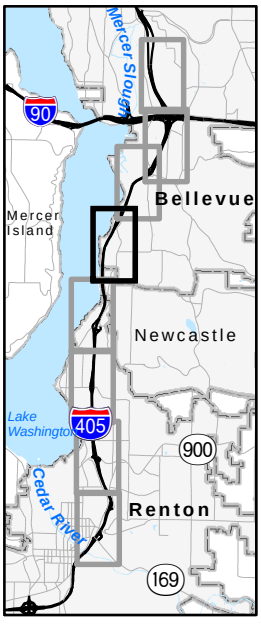

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Renton to Bellevue Project Proposed Improvements

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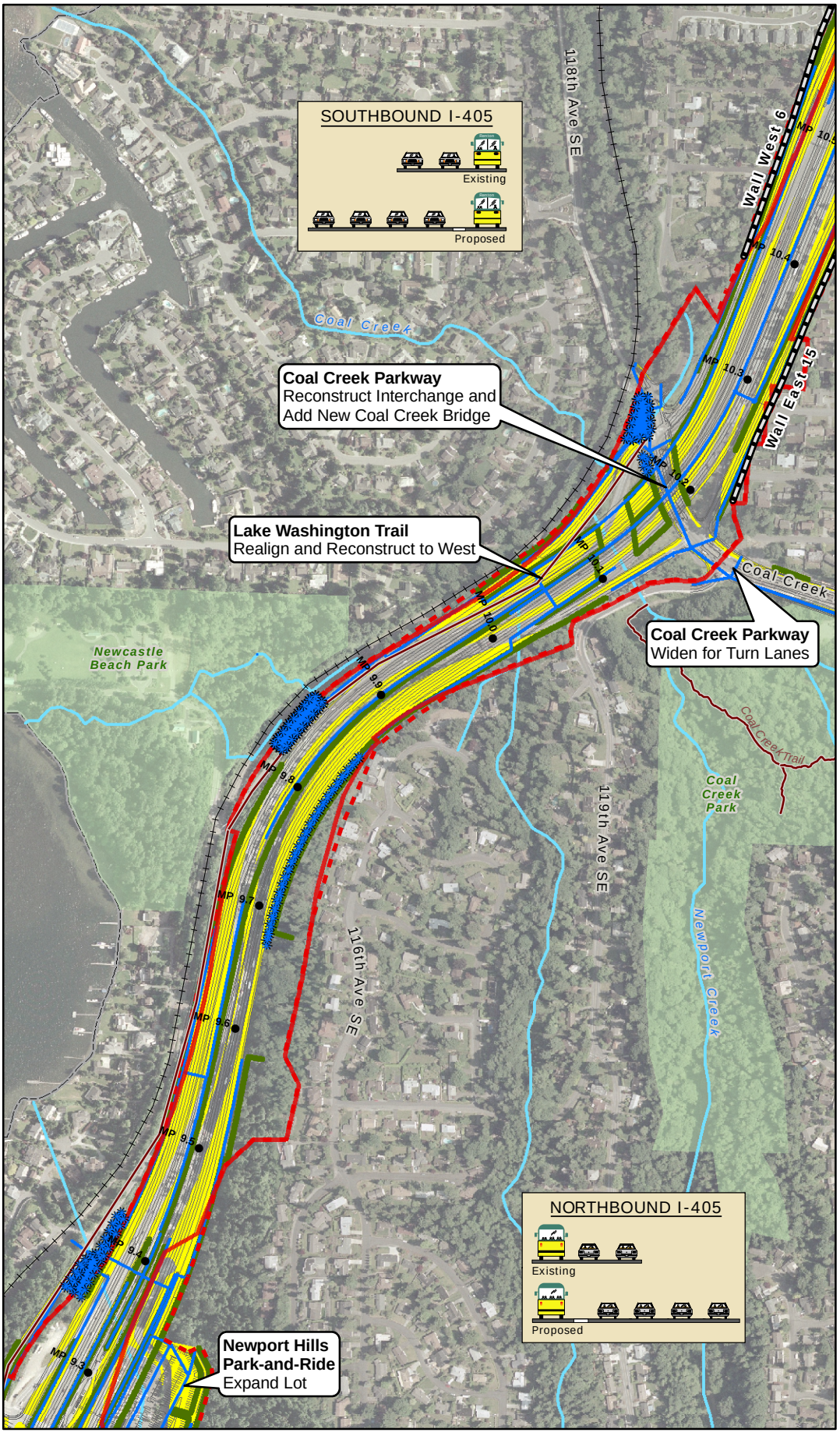

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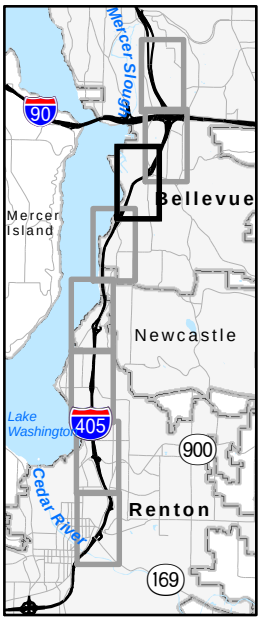

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Renton to Bellevue Project Proposed Improvements

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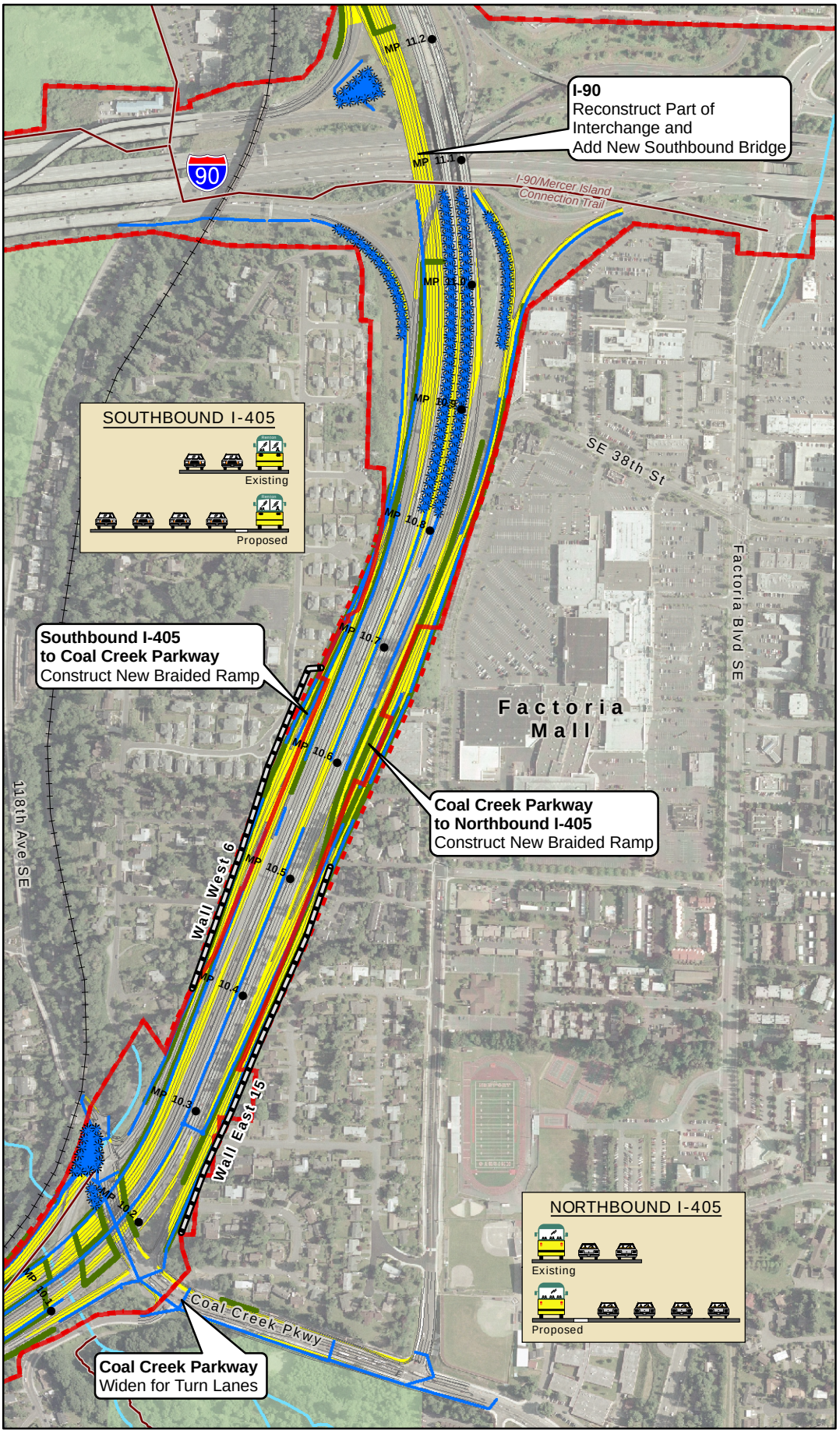

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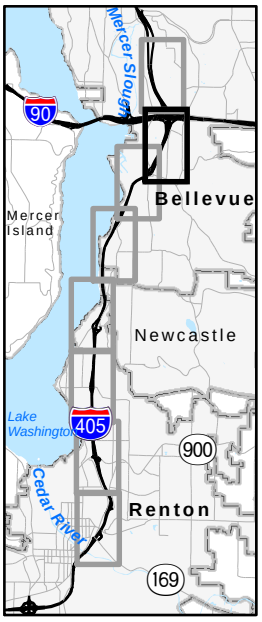

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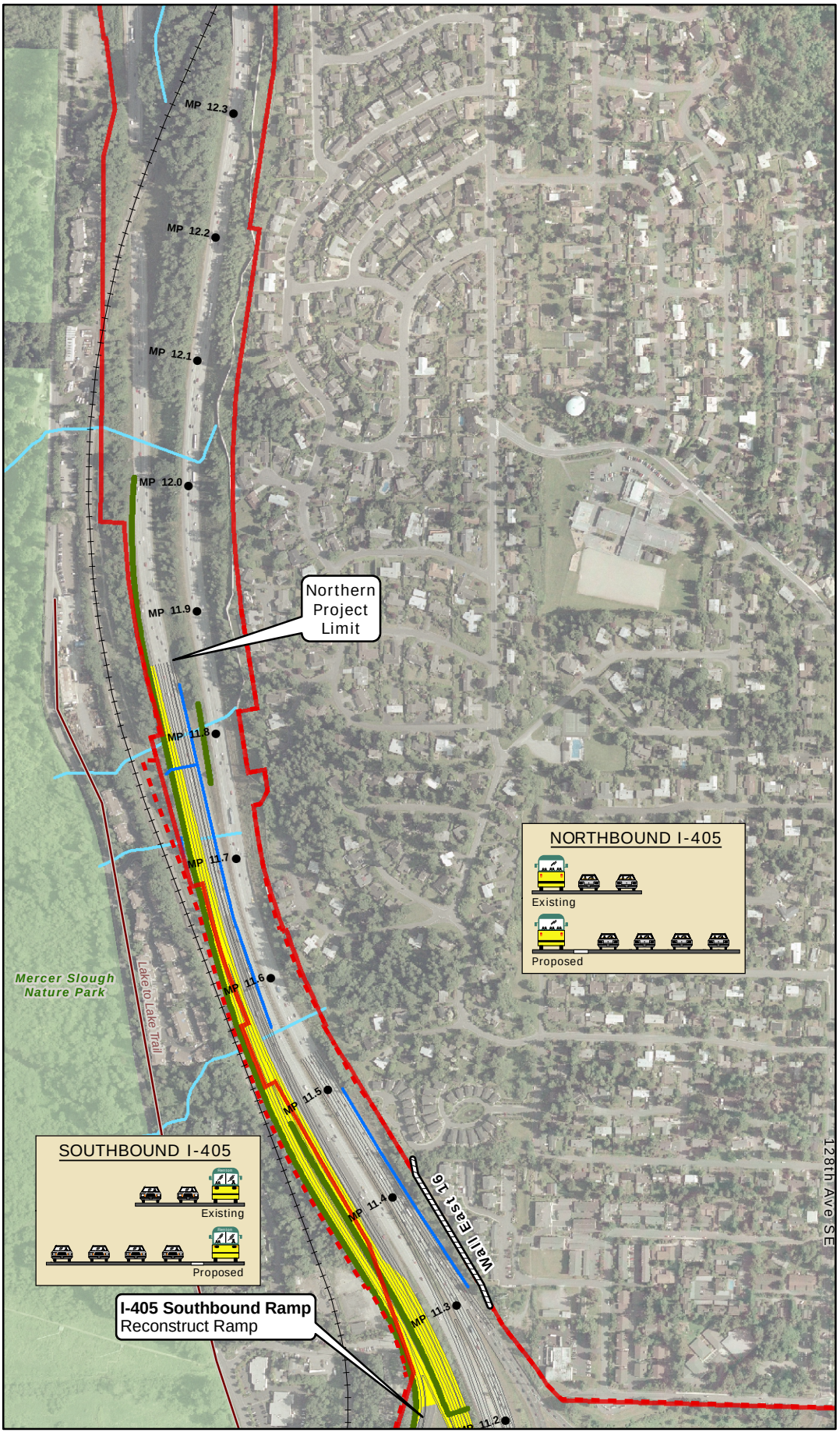
Renton to Bellevue Project Proposed Improvements

EXHIBIT 4-2 | SHEET 7 of 8



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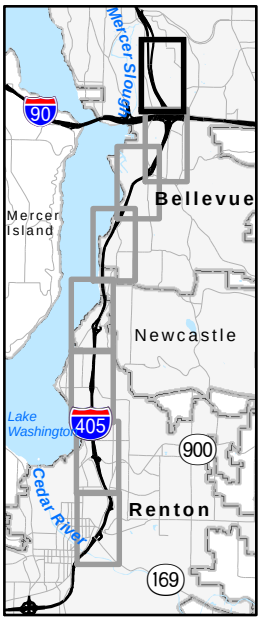

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Renton to Bellevue Project Proposed Improvements

EXHIBIT 4-2 | SHEET 8 of 8

What types of improvements will be made?

Lane Improvements

WSDOT will realign and reconstruct I-405 to add two, 12-foot general-purpose lanes in both the northbound and southbound directions (Exhibit 4-2). The roadway will be improved with approximately 10-foot inside shoulders (to the driver's left) and 12-foot outside shoulders (to the driver's right) in both directions. The freeway design will include a four-foot painted buffer to separate the general-purpose lanes from the inside HOV lane (see northbound and southbound inserts in Exhibit 4-2). In addition to adding the new lanes, the existing lanes will be reconstructed.

Intelligent transportation system (ITS) features will be incorporated into the project. In addition to the planned ramp meters, these features may include electronic variable message signs, highway advisory radio, and enhanced data and communication equipment for incident response. The specific ITS components will be determined during the final design phase of the project.

Transit and HOV System

WSDOT uses the term bus rapid transit (BRT) to describe high-frequency bus service that incorporates capital facilities designed to increase travel speed, reliability, and passenger convenience and comfort. The Renton to Bellevue Project proposes many elements of BRT including maintaining HOV lanes, providing HOV bypasses where ramp meters exist, construction of a transit/HOV direct-access ramp, an in-line BRT station, and park-and-ride lot expansion.

HOV Lanes

WSDOT will maintain one HOV lane in each direction. The project includes a buffer area, envisioned as a four-foot-wide strip of painted pavement separating the general-purpose lanes from the HOV lane. Access to the HOV lanes will be at the direct-access ramps and at specific locations along I-405.

WSDOT will reconstruct the eight interchanges in the Renton to Bellevue project area with ramp meters that give HOV and transit priority over single-occupant vehicles.

Transit/HOV Direct-Access Ramps

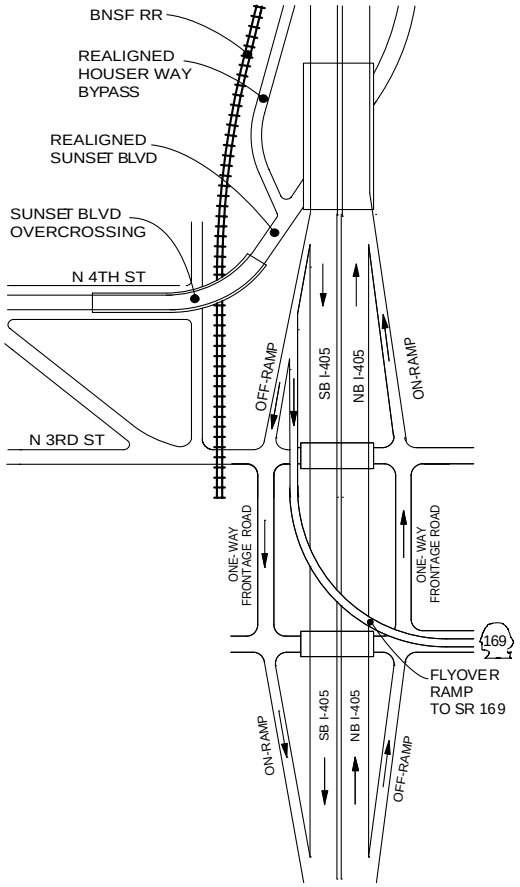
In conjunction with Sound Transit, WSDOT will construct a transit/HOV direct-access ramp at N 8th Street that will allow buses and other HOVs to efficiently enter and leave I-405. The direct-access ramps will eliminate the need for transit, carpools, and vanpools to weave across mainline traffic to exit or enter the freeway HOV lane.

In-line Transit Station

WSDOT will construct a new in-line transit station on I-405 in the vicinity of the 112th Avenue SE interchange. The facility will include a pedestrian bridge over the northbound I-405 mainline lanes to the Newport Hills Park-and-Ride lot. The in-line transit station will eliminate the need for buses to leave the corridor to serve riders. The Newport Hills Park-and-Ride lot will be expanded to add approximately 150 more spaces.

Interchange Improvements

Exhibit 4-3: Reconfiguration of the SR 169 interchange area



Because I-405 is being widened to add two new lanes in each direction, interchange bridges will need to be replaced with longer and/or wider structures to accommodate the new lanes. WSDOT will reconstruct the interchange overcrossings/ undercrossings so that they are in compliance with the Americans with Disabilities Act (ADA). Pedestrian and bicycle facilities will also be provided at many locations. Ramp meters will be installed on all on-ramps except at the I-90 interchange.

SR 169 to N 3rd Street Interchange Area

WSDOT will make the following improvements between SR 169 and N 3rd Street (Exhibit 4-3):

- Widen the northbound off-ramp to SR 169 and the southbound on-ramp south to I-405;
- Construct a one-way, three-lane frontage road northbound from SR 169 to N 3rd Street on the east side of I-405;
- Realign and reconstruct Sunset Boulevard N as a one-way, two-lane frontage road from N 3rd Street to SR 169;

- Realign and improve Sunset Boulevard as a T-intersection with the Houser Way Bypass (the Houser Tunnel will be eliminated);
- Construct a new on-ramp with HOV bypass from N 3rd Street to I-405 northbound; and
- Construct an off-ramp from southbound I-405 to N 3rd Street and a direct connector flyover to southbound SR 169.

N 8th Street HOV Direct Access

In coordination with Sound Transit, WSDOT will make the following improvements at N 8th Street (Exhibit 4-4):

- Reconstruct and widen N 8th Street to accommodate transit/HOV direct access ramps;
- Construct an HOV ramp over Houser Way N, the Burlington Northern Santa Fe Railway (BNSF) tracks, the entrances to PACCAR and Java Trading and the southbound I-405 lanes; and
- Construct on- and off-ramps to both northbound and southbound I-405 HOV lanes.

Park Avenue (SR 900) Interchange Area

WSDOT will make the following improvements to Park Avenue (SR 900) (Exhibit 4-5):

- Replace the I-405 bridges over Park Avenue with longer and wider bridges and reconstruct on- and off-ramps to accommodate the mainline widening; and
- Realign and widen Park Avenue to accommodate right- and left-turn lanes in the vicinity of the interchange.

NE 30th Street Interchange Area

WSDOT will make the following improvements to the NE 30th Street interchange (Exhibit 4-6):

- Construct a northbound auxiliary lane between the Park Avenue on-ramp and NE 30th Street off-ramp;
- Widen NE 30th Street, from Meadow Avenue N to the Kennydale Elementary School to accommodate turn lanes at the interchange and add signals at the intersections with the I-405 ramps; and
- Replace the NE 30th Street bridge over I-405.

Exhibit 4-4: N 8th Street HOV direct access improvements

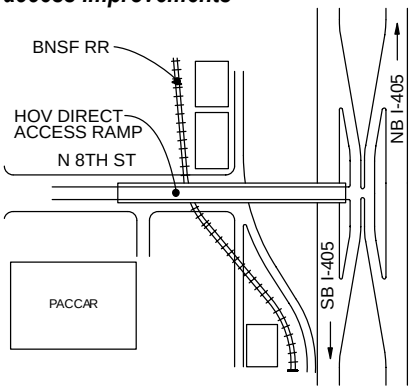


Exhibit 4-5: Park Avenue interchange improvements

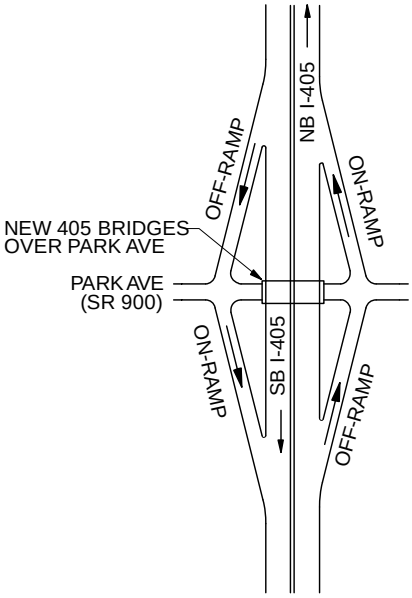


Exhibit 4-6: NE 30th Street interchange improvements

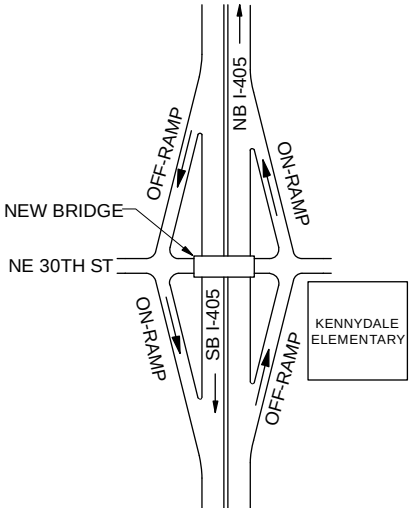


Exhibit 4-7: NE 44th Street interchange improvements

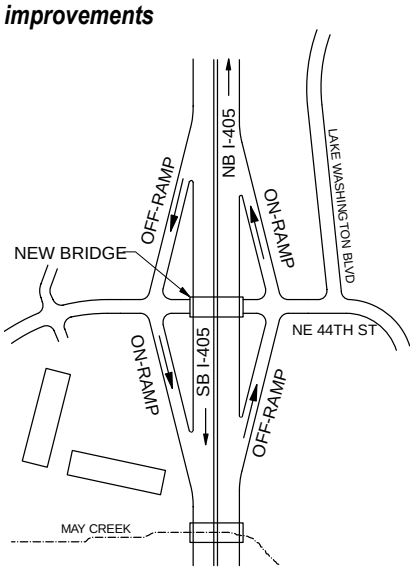
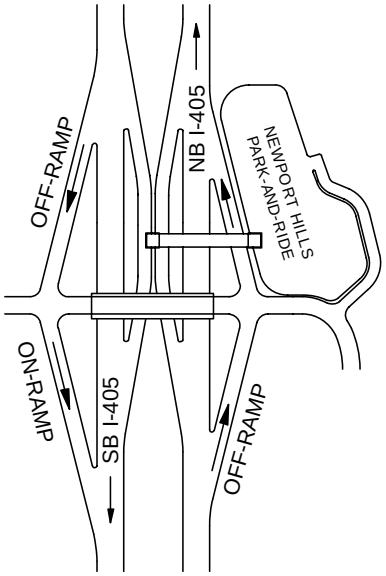


Exhibit 4-8: 112th Avenue SE interchange improvements



NE 44th Street Interchange Area

WSDOT will make the following improvements to the NE 44th Street interchange (Exhibit 4-7):

- Construct northbound and southbound auxiliary lanes between the NE 30th Street and the NE 44th Street on- and off-ramps;
- Replace the NE 44th Street bridge with a longer and wider bridge and reconstruct the on- and off-ramps to accommodate the mainline widening; and
- Reconstruct the northbound and southbound I-405 bridges over May Creek.

112th Avenue SE Interchange Area

WSDOT will make the following improvements to the 112th Avenue SE interchange (Exhibit 4-8):

- Replace the 112th Avenue SE bridge with a longer and wider bridge and reconstruct the on- and off-ramps to accommodate the mainline widening and HOV bypass;
- Construct a new in-line BRT station in the vicinity of 112th Avenue SE with a pedestrian bridge over the northbound I-405 mainline lanes to the Newport Hills Park-and-Ride lot; and
- Expand the Newport Hills Park-and-Ride lot by approximately 150 more spaces.

Coal Creek Parkway Interchange Area

WSDOT will make the following improvements between the 112th Avenue SE interchange and Coal Creek Parkway (Exhibit 4-9):

- Construct a northbound auxiliary lane between 112th Avenue SE and I-90;
- Construct longer and wider northbound and southbound I-405 bridges to span both Coal Creek Parkway and Coal Creek;
- Reconstruct a portion of the Lake Washington Trail;
- Reconstruct the on- and off-ramps to accommodate the mainline widening and HOV bypass; and

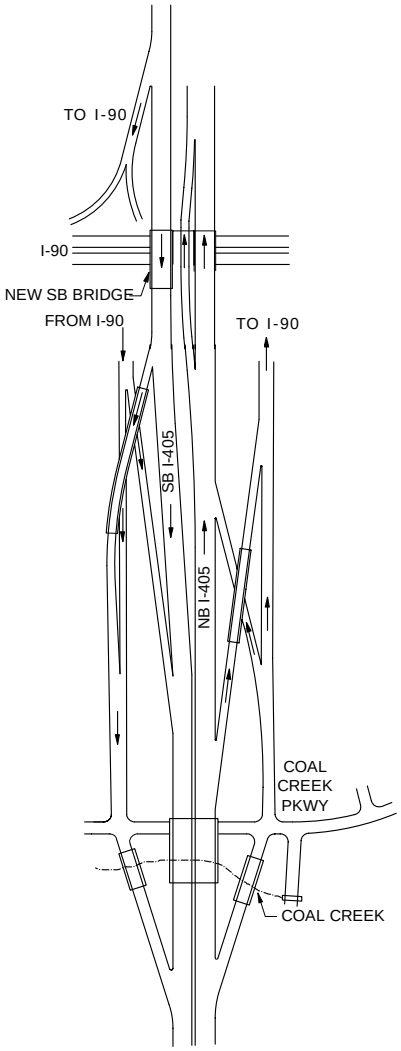
- Construct a southbound auxiliary lane between the Coal Creek Parkway and the 112th Avenue SE on- and off-ramps.

Coal Creek Parkway to I-90 Area

WSDOT will make the following improvements between Coal Creek Parkway and I-90 (Exhibit 4-9):

- Construct a northbound braided on-ramp from Coal Creek Parkway to I-405 crossing under the I-405 off-ramp to I-90 (access from Coal Creek Parkway to I-90 will be accommodated);
- Add a new northbound lane over I-90 by restriping the existing bridge;
- Convert the existing southbound structure to a northbound HOV lane;
- Reconstruct the I-405 southbound off-ramp to I-90 on a new alignment to accommodate widening of I-405;
- Construct a new five-lane southbound bridge over I-90, to the west of, and adjacent to, the existing southbound bridge; and
- Construct a southbound braided off-ramp from I-405 to Coal Creek Parkway, crossing over a reconstructed southbound on-ramp from I-90 (access from I-90 to Coal Creek Parkway will be accommodated).

Exhibit 4-9: Coal Creek Parkway to I-90 interchange improvements



Other Improvements

Local roadway improvements

WSDOT will realign or widen some local streets. Specific project improvements include:

- Install a new traffic signal at the intersection with N 3rd Street and the new northbound frontage road;
- Realign Sunset Boulevard (SR 900) as a T-intersection with the Houser Way Bypass, rather than merging at an angle;
- Realign Sunset Boulevard and Houser Way Bypass to form a new intersection with N 4th Street;
- Remove the Houser Way tunnel;

- Close off a portion of Grandey Way NE/Windsor Way NE nearest I-405 and construct cul-de-sacs at the termini;
- Widen NE Park Drive (SR 900) from Aberdeen Avenue NE to the bridge over the BNSF tracks to accommodate turn lanes;
- Widen NE 30th Street, from Meadow Avenue N to the Kennydale Elementary School to accommodate turn lanes at the interchange and add signals at the intersections with the I-405 ramps;
- Widen NE 44th Street, from NE 30th Place (SE 80th Street in Newcastle) to the vicinity of Hazelwood Lane, including reconstruction of the intersection with Hazelwood Lane, for turn lanes;
- Relocate a portion of Lake Washington Boulevard SE approximately 200 feet to the east so that the NE 44th Street interchange can be reconfigured; and add signals at the intersection with the I-405 ramps;
- Remove 109th Avenue SE and adjacent properties purchased for widening of I-405;
- Realign 112th Avenue SE within the vicinity of the 112th Avenue SE interchange and add signals at the intersection with the I-405 ramps and reconstruct a portion of Lake Washington Boulevard SE; and
- Widen Coal Creek Parkway from 120th Avenue SE to 124th Avenue SE for an additional eastbound lane. As part of this widening, WSDOT may construct a multi-use boardwalk (timber trail) in Coal Creek Park adjacent to the roadway.

Existing noise wall

Retaining walls

WSDOT will construct retaining walls along much of the project. Retaining walls will be used to limit areas of extensive cuts and fills and reduce the project footprint and, consequently, reduce impacts to adjacent properties and environmentally-sensitive areas. Fill walls will be used to confine the fill material used to support the mainline. Cut walls will be used to confine the earth that remains after material has been cut from adjacent hillsides. Retaining walls will also be necessary at the approach roads.

Noise walls

WSDOT is proposing to construct four new noise walls in the project area and reconstruct five existing noise walls closer to the edge of the right of way to reduce noise effects. These nine noise walls (new and reconstructed) will have a total length of almost 3 miles; the locations of new noise walls are identified in Exhibit 4-2. The noise walls will be built only if desired by the neighborhood residents.

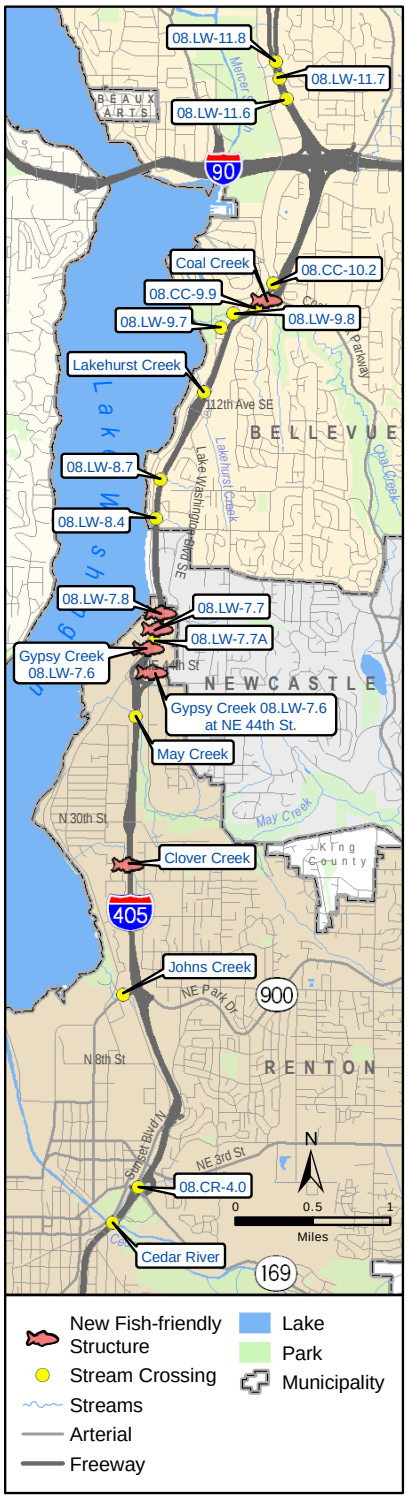
Stream Crossings

Construction of the Renton to Bellevue Project will require crossing 22 streams. Coal Creek and May Creek will be bridged, while other streams crossing under I-405 will remain in culverts. In a number of cases, existing culverts will be replaced with new fish-friendly structures. The stream crossings are summarized in Appendix B, which also lists the project activity associated with each stream. Stream crossing locations are shown in Exhibit 4-10.

WSDOT will make fish passage improvements at the following locations:

- Clover Creek crossing – a new fish-friendly culvert and new stream channel;
- Gypsy Creek crossing – two new fish-friendly culverts;
- Steam 08.LW-7.7A crossing – new fish-friendly culvert;
- Stream 08LW-7.8 crossing – new fish-friendly culvert; and
- Coal Creek crossing – replacement of culvert with a bridge.

Exhibit 4-10: Stream crossings



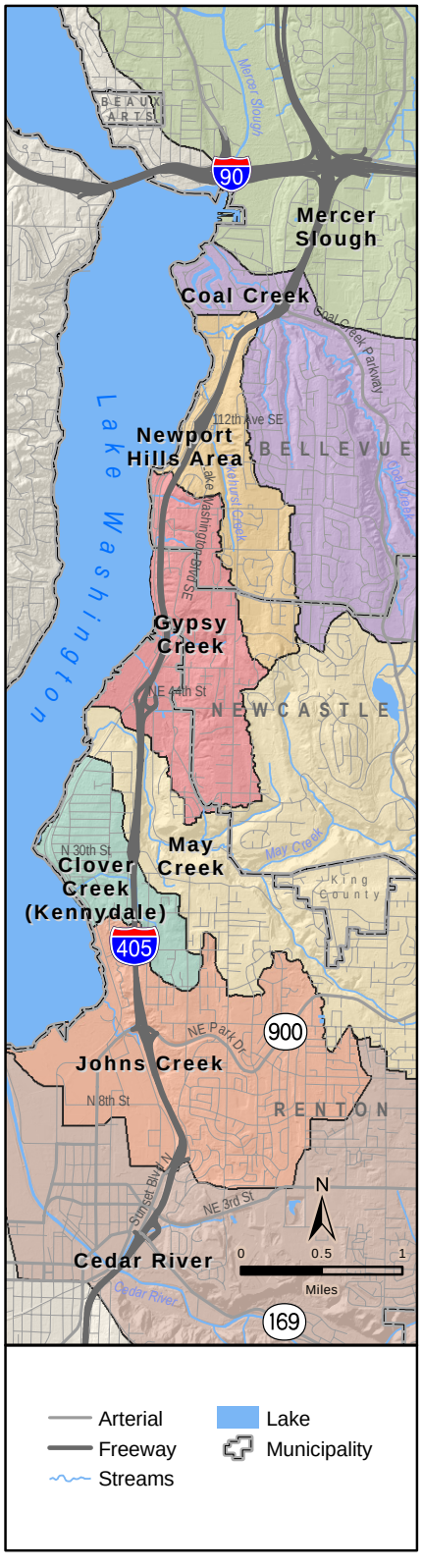
How will stormwater from the project be managed?

Stormwater Design Standards

We have designed the stormwater management facilities for the project to comply with the guidelines and procedures in the WSDOT *Highway Runoff Manual* M 31-16, March 2004, and the WSDOT *Hydraulics Manual* M 23-03, March 2004.

The I-405 Renton to Bellevue Project spans eight primary watersheds or drainages that drain to Lake Washington. The watersheds, listed from south to north, are:

Exhibit 4-11: Watersheds



- Cedar River
- Johns Creek
- Clover Creek (Kennydale Area)
- May Creek
- Gypsy Creek
- Newport Hills Area (a collection of small drainages)
- Coal Creek
- Mercer Slough

The approximate watershed boundaries are shown in Exhibit 4-11. The watersheds are further broken down into on-site and off-site drainage subbasins. The on-site subbasins are project areas where the stormwater is contained and treated prior to discharge into the local aquatic environment. Each on-site subbasin, called a threshold discharge area, drains treated stormwater to a single existing discharge location within 0.25 miles downstream of the freeway.

Drainage from off-site subbasins will be usually kept separate from the on-site drainage, passing through the highway corridor in bridges, culverts, or cross-drain storm drains. Some off-site drainage modifications will include improvements for fish passage and flow capacity. Otherwise, the off-site drainage will not be treated and will continue to pass under I-405 as it currently does.

Stormwater from project area subbasins will be collected and conveyed according to the safety and hydraulic criteria contained in the *WSDOT Hydraulics Manual* (2004). The project will be constructing a new collection and conveyance system that will use, for the most part, new inlets and storm drain pipes. Prior to discharge, the new and replaced pavement runoff will be treated for water quality. The peak rate and duration of discharge will be controlled to mimic the theoretical flows as if the area was in a natural land cover condition, which would release runoff at a much slower rate than the urban land cover that exists today. Where stormwater can be directly discharged to either the Cedar River or Lake Washington, WSDOT will not be required to control discharge rates. Water quality and flow control performance will be designed and constructed in accordance with the *WSDOT Highway Runoff Manual*, March 2004.

Stormwater Treatment Facilities

The Renton to Bellevue Project will provide water quality treatment for the new and replaced project pavement areas. A total of approximately 176 percent of new pavement area will be treated for water quality (see Exhibit 4-12). The primary treatment for the I-405 Corridor area will be by ecology embankment (see Exhibit 4-13). Best management practices (BMPs), such as wet ponds or vaults, will be required for some of the city street improvements.

Exhibit 4-12: Summary of runoff treatment by watershed

Watershed	Existing Lanes and Shoulders (Impervious Area[1]) (acres)	New Lanes and Shoulders (Impervious Area) (acres)	Total Lanes and Shoulders (Impervious Area) Treated (acres)	Percent of New Lanes and Shoulders (Impervious Area) Treated
Cedar River	17	16	33	190%
Johns Creek	39	17	56	152%
Gypsy Creek[2]	51	45	96	88%
Newport Hills Area	21	35	56	267%
Coal Creek	13	2	15	117%
Mercer Slough	21	9	30	141%
Project Total	**162**	**124**	**286**	**176%**

(Numbers have been rounded)

[1] Includes I-405, interchanges, and some surface streets where construction will occur.

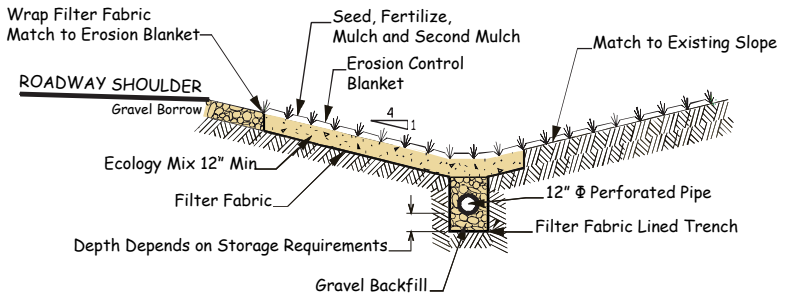
[2] Includes impervious areas in the Clover Creek and May Creek watersheds, since no stormwater is discharged to either of these two watersheds.

What is an ecology embankment?

An ecology embankment is a linear stormwater treatment and conveyance feature that infiltrates and filters runoff from roadway shoulders.

Ecology embankments are the preferred method of treatment because of their flexibility in construction and maintenance, enhanced treatment capabilities, and relatively low cost. The use of ecology embankments actually exceeds the HRM requirements, since direct discharge to Lake Washington only requires "basic treatment" instead of this proposed "enhanced treatment" type of BMP. WSDOT is proposing to construct a total of 17 ecology embankments in the project area that total

Exhibit 4-13: Ecology embankment cross-section



approximately 3,800 linear feet and cover approximately 127,000 square feet.

WSDOT is proposing to construct water quality treatment facilities at N 8th Street, in the Johns Creek Watershed at MP 4.4, and in the Mercer Slough Watershed near the I-90 interchange.

What is direct discharge?

Direct discharge refers to release of stormwater to a large body of water without prior detention.

A final determination of the exact treatment facilities (for example, placement, size/capacity, and mix of quantity and quality treatment) necessary to meet highway runoff discharge criteria has not yet been made.

WSDOT is exploring several approaches to collection, treatment, and discharge of stormwater from I-405 in the vicinity of Coal Creek and Newcastle Beach Park. The most innovative approach would collect I-405 stormwater, treat it, and divert it away from Coal Creek into a channel that flows directly into Lake Washington through Newcastle Beach Park. This approach avoids adding more I-405 stormwater to Coal Creek, which currently experiences flooding and water quality problems. One of the features of this plan is that it would include City of Bellevue stormwater and local groundwater as part of the discharge to Lake Washington. This approach discharges treated stormwater through an existing stream channel that runs along the park entrance road, crosses the road, and flows into Lake Washington just south of the park's recreation area. Wetland, stream, and park enhancements may be provided with this approach. The enhancements may include parking lot improvements to eliminate flooding and pedestrian access improvements across the channel. Improvements will be coordinated with the City of Bellevue. WSDOT may also choose a more conventional method of

stormwater management that would provide treatment and detention in vaults or ponds and subsequent discharge to Coal Creek.

Stormwater Flow Control

Project stormwater will be treated and then discharged directly to either the Cedar River or Lake Washington. Stormwater detention is not required for discharge to Lake Washington or the Cedar River, because these water bodies are so large that no measurable increase in hydraulic conditions and velocities will occur with the increased runoff.

Drainage Collection and Conveyance

Due to the reconfiguration and new construction of the highway for this project, almost all of the existing drainage system will need to be replaced. Ecology embankments on the edge of the roadway shoulders will be used as the preferred conveyance method; however, where the corridor is tightly confined by adjacent property development and sensitive areas, stormwater collection will be done using inlets and pipes.

In addition to ecology embankments, proposed collection and conveyance systems will consist of standard WSDOT catch basin and manhole structures connected to the treatment and flow control facilities. Pipe sizes will generally range from 12 to 30 inches in diameter and be installed on grades and at depths necessary for proper vertical clearances and stormwater flow. Inlets will be placed at specific locations to limit the spread of stormwater into the travel lanes, as required by the WSDOT Hydraulics Manual.

Culverts

WSDOT anticipates that improvements to the freeway mainline and associated interchanges will impact the existing cross-culverts. Since the highway is being reconfigured and the age of the culverts exceeds their design lifespan, WSDOT expects that most of the existing culverts will be replaced; five of the culverts will be replaced with fish-friendly structures.

Right of Way Requirements

WSDOT will acquire approximately 44 acres of land for right of way. This new right of way will be used for construction of additional lanes on the I-405 mainline, reconstruction of the interchanges, construction of the transit/HOV direct access

ramps, and realignment of local roadways. Additional properties will be acquired for environmental enhancements, such as wetland mitigation and stormwater facilities.

At this stage of project design, WSDOT estimates that the Renton to Bellevue Project will affect approximately 163 parcels: 102 properties within the City of Renton (53 commercial, 48 residential, and 1 publicly-owned); 51 in Bellevue (4 commercial and 47 residential); and 10 in Newcastle (all residential). Of the affected parcels, 105 are residential (43 partial and 62 full acquisitions) and 57 are commercial (38 partial and 19 full acquisitions).

How will the project incorporate community design preferences?

The Renton to Bellevue Project is being planned, developed, and designed in accordance with guidelines called Context Sensitive Solutions (CSS), also referred to as Context Sensitive Design. These guidelines provide a means of incorporating community design preferences into the project.

What are Context Sensitive Solutions?

Context Sensitive Solutions is a design process that incorporates community values on appearance, the environment, mobility, and safety. WSDOT incorporated CSS into the design of the facility by working with local agencies and citizens on the "look and feel" of the project design.

How are Context Sensitive Solutions guidelines being incorporated?

The guidelines that were developed with each of the communities have been incorporated into the aesthetics and urban design elements throughout the corridor. These design elements include abutment walls ornamented with organic geometric designs and patterned stone finish, pedestrian-scale lights of enhanced design for walkways under and over the bridges. These lights are similar to those found at Renton's downtown Transit Station/Urban Center. Other elements include sidewalk designs, consistent color schemes to concrete and metal surfaces, new noise wall patterns including design for transitions from existing to new, and enhanced landscaping that blends with the natural environment.

How does the Context Sensitive Solutions process work?

Working with the public and elected officials, WSDOT developed design themes to be used with future improvements along the corridor. WSDOT's CSS team prepared illustrations and photos of design features, beginning with examples of local baseline design, and compared them to options implemented in other parts of the country. Committee preferences were then narrowed down to

features that could be incorporated into the Urban Design Guidelines Manual (unpublished) for the I-405 Corridor. These preferences were later reviewed by WSDOT's Technical Committee and others within corridor jurisdictions to ensure they fit with corridor-wide features and maintenance standards.

How will the project be constructed?

WSDOT expects to construct this project using a design-build contract. Design build is a method of project delivery in which WSDOT executes a single contract with one entity for design and construction services to provide a finished product. With design-build projects, contractors have the flexibility to offer innovative and cost-effective alternatives to deliver the project. None of the design modifications that the contractor may make will affect the project footprint or project effects described in this environmental assessment. All WSDOT design standards, performance measures and activities to avoid or minimize effects to the environment will be met.

Project construction is expected to last from three to five years. The at-grade roadway construction work will include the removal of existing asphalt and concrete surfaces, clearing and grading adjacent areas, laying the aggregate roadway foundation, and placing of asphalt and concrete surfaces. Changing the vertical and horizontal alignments of the I-405 mainline will require substantial earthwork, with approximately 2.7 million cubic yards of cut and approximately 2.2 million cubic yards of fill.

Construction equipment such as backhoes, excavators, front loaders, pavement grinders, jack hammers, pile drivers, trucks, as well as grading and paving equipment will be used. Equipment used for construction will include cranes, pile drivers, drilling rigs and augers, backhoes and excavators, jack hammers, concrete pumping equipment, and slurry processing equipment.

Staging areas in unused right of way will provide room for employee parking, large equipment storage, and material stockpiles. Construction staging will not be permitted within the Zone 1 area of the City of Renton's sole source aquifer but will occur within areas of existing or newly-acquired right of

way adjacent to the mainline. The contractor may also find other locations for staging.

What is the project construction schedule?

Construction is expected to take place in steps, with the entire construction phase lasting at least five years. It is likely that sections of the Renton to Bellevue Project will be constructed in two steps. WSDOT expects that during the first step, traffic will be maintained on the current roadway while the new roadway is constructed to the outside. The first step of construction will include the following activities:

- Utility relocation;
- Construction of drainage and stormwater treatment facilities;
- Grading and paving for new roadway;
- Retaining wall construction;
- Bridge demolition and construction; and
- Environmental improvements.

During subsequent steps, traffic will be shifted to the previously constructed portion so that we can remove and reconstruct existing lanes.

What is the No Build Alternative?

The No Build Alternative is WSDOT's continued routine maintenance. These activities include short-term minor construction necessary for continued operation of the existing I-405 facility and minor safety improvements, as required, within the project limits.

CHAPTER 5

How will the environment be affected?

This chapter presents an analysis of the potential effects of the Renton to Bellevue Project on people and the environment. The WSDOT project team conducted 21 different studies and summarized their analyses in discipline reports to illustrate how the project might affect the area. We used this information to evaluate changes that can occur as a result of constructing improvements to I-405.

Mature oak tree in Cedar River Park

How did WSDOT analyze the Renton to Bellevue Project's effects on the environment?

The WSDOT project team prepared the following discipline reports for the project. The complete discipline reports (listed below in alphabetical order) are found in Appendices F through AA on a CD included with this Environmental Assessment.

- Air Quality (Appendix S)
- Cumulative Effects (Appendix AA)
- Economic Elements (Appendix L)
- Energy (Appendix K)
- Environmental Justice (Appendix M)
- Fish and Aquatic Resources (Appendix X)
- Geology, Soils, and Groundwater (Appendix Y)
- Hazardous Materials (Appendix Z)
- Historic, Cultural, and Archaeological Resources (Appendix P)
- Land Use Patterns (Appendix J)
- Land Use Plans and Policies (Appendix I)
- Noise (Appendix H)
- Public Services and Utilities (Appendix Q)
- Section 4(f) Evaluation (Appendix O)
- Social Elements (Appendix N)

What is a discipline report?

A discipline report focuses on an environmental topic (discipline) of concern, such as wildlife, noise, water quality, or other built or natural resources. It presents an analysis of the environment with respect to that discipline, how the project may affect that element of the overall environment, and provides strategies to avoid or minimize adverse effects to that environment.

- Surface Water and Floodplains (Appendix T)
- Transportation (Appendix G)
- Visual Quality (Appendix R)
- Water Quality (Appendix U)
- Wetlands (Appendix V)
- Wildlife and Vegetation (Appendix W)

What are potential effects?

Potential effects are impacts or changes that could occur as a result of a proposed action. The effects may be ecological, aesthetic, historic, cultural, economic, social, or health-related. Examples might include the encroachment upon nearby wildlife that occurs from widening a roadway; the improvement of fish passage from retrofitting a blocked culvert; or how increased noise levels from traffic flow might affect nearby residents.

The study area for each discipline report varied, depending on the geographic extent of the potential effects being evaluated and the type of data needed for the analysis. For example, the analysis of recreational facilities as evaluated in Section 4(f) required WSDOT to collect data on parks within 0.25 miles of the I-405 right of way. To assess effects on social characteristics, WSDOT used Census information and the Puget Sound Regional Council's (PSRC) Forecast Analysis Zone data, because these data cover a wider geographic area around I-405.

How was environmental information used to improve the project?

Our project team collected environmental baseline data, and then identified places where project construction could have an effect on the environment. For example, to reduce effects to wetlands, we overlaid wetland locations on the preliminary design plans and made adjustments in the roadway alignment, roadside slopes, and location of stormwater facilities. Our team made several field visits to examine culvert crossings along the corridor and to propose ways of modifying the grading plan to avoid the need to extend culverts, and to minimize or avoid effects to streams. We also used information about the sole source aquifer protection area in Renton to modify the location of stormwater discharge points to avoid potential effects on water quality and aquifer recharge. We made similar efforts to reduce or avoid effects to visual quality, vegetation, and noise.

How were potential effects evaluated?

After making design modifications to minimize or avoid effects, our project team compared the project design to the baseline conditions. By making this comparison, we determined environmental, social, and economic changes that will result from the Renton to Bellevue Project compared to

the No Build Alternative. For example, we evaluated what can happen to water quality both during and after construction. Economists examined the effects of property acquisitions on social and economic conditions.

Our team members evaluated these and other aspects of the environment and documented their findings in separate discipline reports. The results of these analyses are summarized in this chapter.

For a cross reference of how discipline reports were grouped in this EA with respect to the NEPA Elements of the Environment, please see Appendix D.

5.1 Traffic and Transportation

The I-405 Corridor serves as an important transportation thoroughfare for the region. Increased traffic is a result of growth of the state and regional economies and associated changes in employment and population. Understanding how existing traffic and transportation conditions will change over time is important to many people within the region. WSDOT has assessed the data for both the proposed project and the No Build Alternative to provide an accurate depiction of how traffic conditions along I-405 will look in the future with or without the project.

Traffic on I-405 in the project area

How did we evaluate traffic and transportation data for the Renton to Bellevue Project?

WSDOT used a travel demand forecasting model, consistent with the Puget Sound Regional Council's (PSRC) forecasts, to provide information about future year traffic volumes on I-405. WSDOT reviewed the results of these forecasts for consistency with the cities of Kirkland, Bellevue, and Renton, King County Metro, Sound Transit, and the PSRC. Then, we used a microsimulation model to analyze freeway operations.

Please refer to the Renton to Bellevue Project Transportation Discipline Report in Appendix G (on CD) for a complete discussion of the traffic analysis.

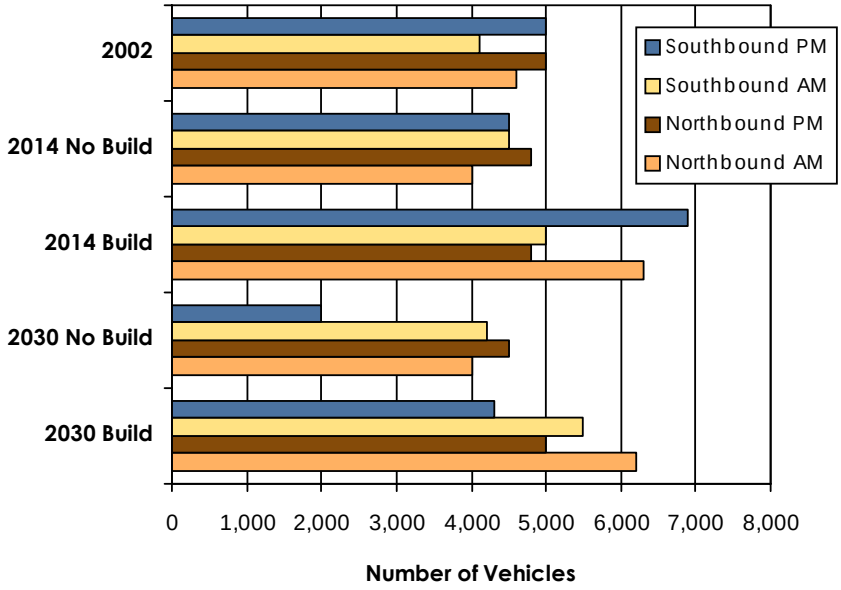
What is traffic like now along the freeway and what will happen in the future?

On a typical weekday, 135,000 vehicles currently travel along the I-405 Corridor in the study area. Half of them travel northbound and half travel southbound. After the project is constructed, our traffic models predict that 188,000 vehicles will travel along this section of the I-405 Corridor in 2014; 212,000 vehicles will travel this section in 2030. If the project is not built, the flow of traffic would become so constrained that not all drivers wishing to travel on I-405 will be able to do so. Delays would force 40,000 drivers to seek alternative routes on local and regional roadways, choose to travel by different means, or forego their desired trips altogether. Exhibit 5.1-1 shows existing traffic volumes and projected volumes for 2014 and 2030 for the project and the No Build Alternative during peak hours.

What is the Puget Sound Regional Council?

The Puget Sound Regional Council is the regional transportation, economic and growth planning agency for the central Puget Sound region. It serves as a forum for cities, counties, ports, transit agencies, tribes, and state agencies to coordinate on important regional issues.

Exhibit 5.1-1: Vehicles traveling I-405 through the project area during the peak hours (modeled at the NE 44th Street Interchange)



Typical traffic congestion on southbound I-405 (I-90 to I-405 south on-ramp)

During the peak period, the Renton to Bellevue section of I-405 commonly experiences bumper-to-bumper and stop-and-go traffic with more rear-end collisions than during non-peak periods. The usual morning peak hour traffic congestion occurs around 7:00 AM to 8:00 AM; in the evening the greatest congestion occurs from 4:00 PM to 5:00 PM. Congestion is typically the worst for northbound morning commuters and southbound evening commuters. As congestion has increased in the region, it has extended these peak periods to the point that congestion commonly lasts for several hours in both the morning and evening.

Exhibit 5.1-2 presents a general overview of southbound and northbound traffic conditions during the morning and evening peak periods, while Exhibits 5.1-3 and 5.1-4 provide visual comparisons between the Build and No Build alternatives in 2014. In the analysis of future traffic conditions, we assume a change in HOV lane eligibility by 2014 from two or more persons per vehicle (HOV 2+) to three or more persons per vehicle (HOV 3+). WSDOT expects to implement this change once the HOV average speed drops below 45 mph.

The Corridor EIS identified possibilities to better manage the corridor through tolling. WSDOT could achieve this through the use of High Occupancy Toll (HOT) lanes so that HOVs and transit could use the lane for free and other vehicles would pay a toll to use the lane. HOT lanes could be created through

Exhibit 5.1-2: Traffic conditions today

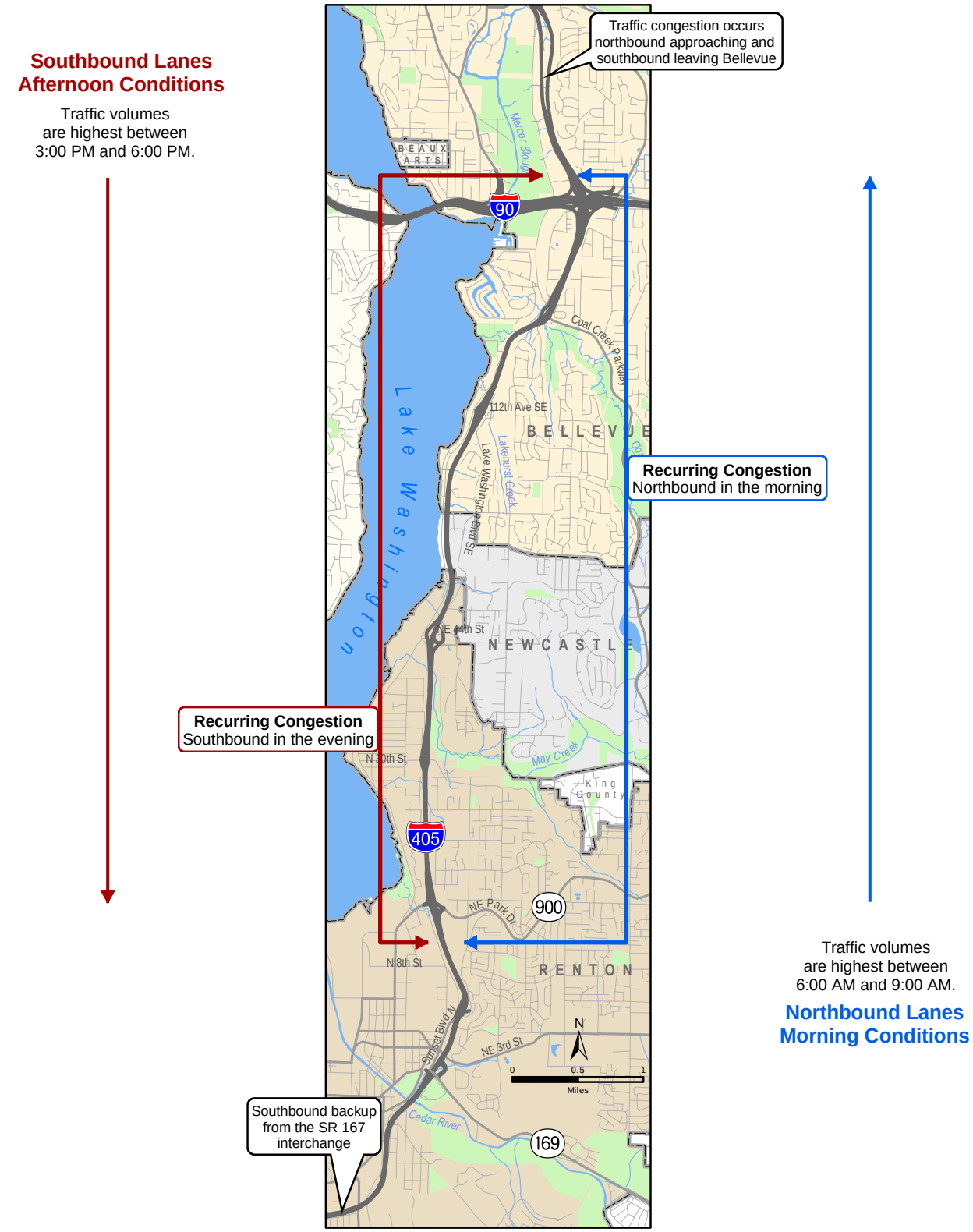


Exhibit 5.1-3: Northbound morning freeway speeds in 2014, compared with the No Build Alternative

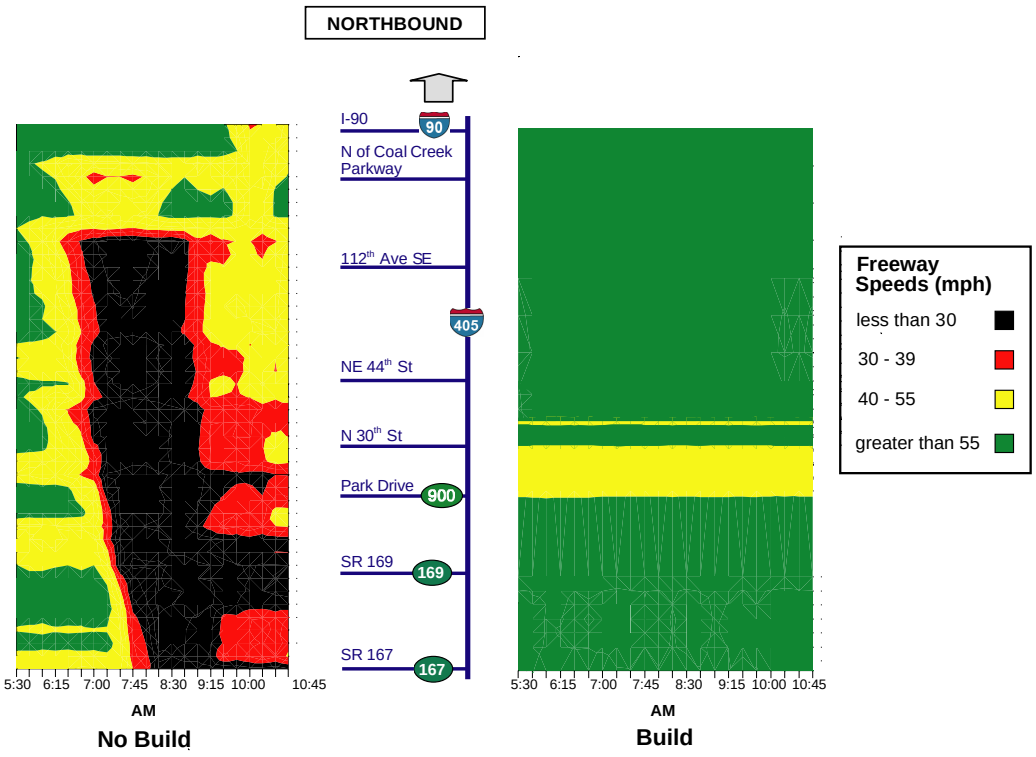
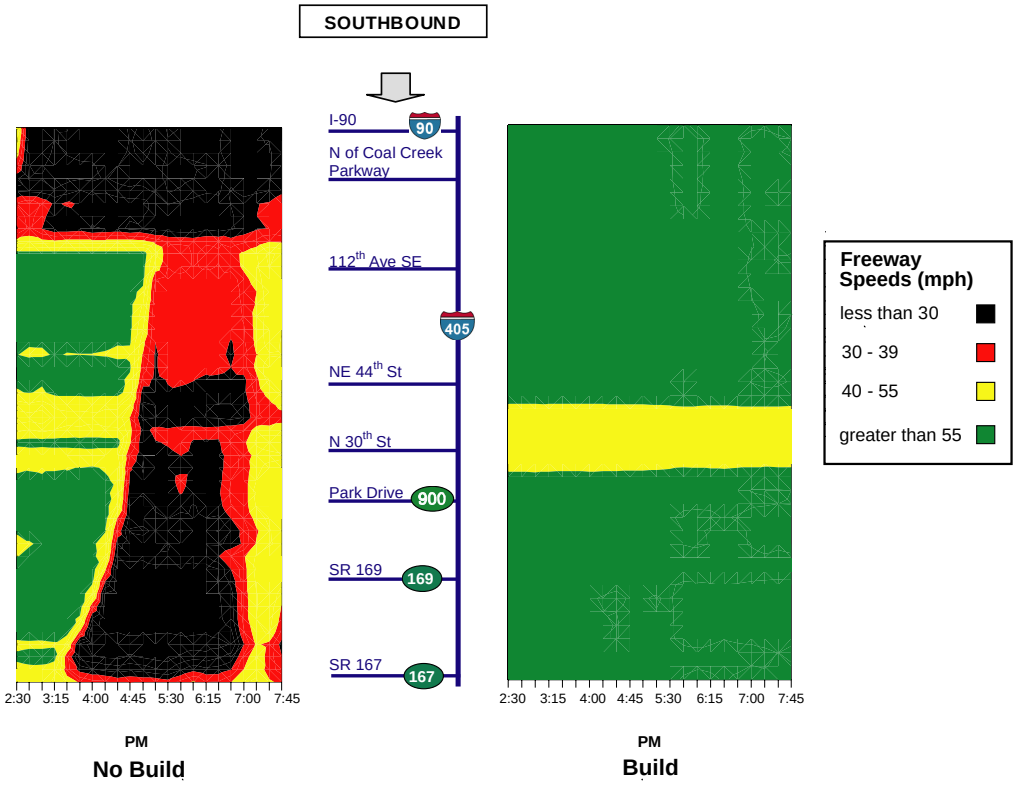


Exhibit 5.1-4: Southbound evening freeway speeds in 2014, compared with the No Build Alternative



the conversion of the existing HOV lane or by using one of the new lanes proposed by this project. The footprint identified in this document would not preclude implementation of HOT lanes. The freeway system would, however, operate differently if HOT lanes are used. If HOT lanes are to be implemented in the future, additional operational analysis and any necessary environmental documentation would be prepared. An operational change to HOT lanes would be a future decision.

The following paragraphs give a snapshot of traffic conditions today and how they will look in the future on this section of I-405.

Northbound in the Morning

Today

The typical northbound morning peak hour has between 4,100 and 5,500 vehicles; 15 to 20 percent of these are in the HOV lane. General-purpose traffic is so congested that average speeds are much less than 45 mph (often less than 25 mph) with frequent stop-and-go conditions. Typically, this means it can take up to 19 minutes to travel 7 miles from SR 169 to the Coal Creek Parkway interchange[1]. Traffic in the HOV lane tends to move at the posted speed limit and makes the same trip in over 6 minutes.

No Build Alternative in 2014

If WSDOT does not build the project, the freeway would carry 3,000 to 5,000 vehicles during the peak hour by 2014. This represents a decrease of 500 to 1,000 vehicles compared with existing conditions. The decrease in traffic flow would result from growing congestion within the corridor, restricting the amount of traffic that could move along the freeway. Another contributing factor is the assumed change in HOV lane eligibility by 2014 from two or more persons per vehicle (HOV 2+) to three or more persons per vehicle (HOV 3+). A change to HOV 3+ would create additional congestion within the general-purpose traffic lanes. A trip from SR 169 to Coal Creek Parkway would increase by 1 to 2 minutes compared with existing conditions. HOV 3+ vehicles would travel at the posted speed limit.

[1] In the I-405, SR 169 to I-90, Renton to Bellevue Transportation Discipline Report, this trip is also referred to as Renton to Factoria.

Build Alternative in 2014

The proposed project will add capacity to I-405 and improve traffic conditions. Most of the congestion that currently exists along this section of freeway will be relieved. For example, with improvements, the northbound freeway will be able to carry 5,100 to 7,200 vehicles per hour and travel times will drop from 19 minutes to less than 7 minutes for the 7-mile trip from SR 169 to Coal Creek Parkway. The HOV lane traffic volumes and average speeds will be similar to 2014 No Build conditions.

No Build Alternative in 2030

In 2030, the northbound commute would be similar to that in 2014. However, northbound congestion on I-5 in Tukwila and on SR 167 approaching Renton would worsen and constrain the traffic volumes from reaching the project area. Traffic congestion would also spread throughout the morning period.

Build Alternative in 2030

In 2030, most of the congestion will still be relieved despite carrying between 4,300 and 7,200 vehicles in the morning peak hour. The travel times will remain in the 6- to 7-minute range at speeds near 60 mph, the posted speed limit.

Southbound in the Evening

Today

Currently, the southbound evening traffic congestion is better than the morning northbound peak period. However, conditions vary widely from day to day. The freeway carries up to 5,000 vehicles per hour during this period. Typically, general-purpose traffic takes between 7 to 8 minutes to travel from Coal Creek Parkway to SR 169[2]. Traffic in the HOV lane tends to move at the posted speed limit.

No Build Alternative in 2014

If WSDOT does not build the project, then congestion would increase along I-405 during the evening commute. Traffic volumes in the southbound direction would be in the range of 2,900 to 4,800 in the evening peak hour, which would be 500 to 800 vehicles less than today. The decrease in traffic flows would mostly be the result of growing congestion within the

[2] In the I-405, SR 169 to I-90, Renton to Bellevue Transportation Discipline Report, this trip is also referred to as Factoria to Renton.

corridor and backups that would lengthen from the worsening bottleneck at the SR 167 interchange. In 2014, a trip from Coal Creek Parkway to SR 169 would increase to nearly 13 minutes compared with existing conditions of over 7 minutes. HOV speeds would be near the posted speed limit.

Build Alternative in 2014

The proposed project will add much greater capacity to I-405 and improve traffic conditions. The southbound freeway will be able to carry 50 percent more traffic (5,200 to 7,200 vehicles per hour), and travel times will drop from 12 to 13 minutes in the 2014 No Build to about 7 minutes for the 7-mile trip from Coal Creek Parkway to SR 169. The HOV lane traffic volumes and average speeds will be similar to 2014 No Build conditions, near the posted speed limit.

No Build Alternative in 2030

In 2030, the southbound traffic volumes would drop to between 1,000 and 2,200 vehicles in the evening peak hour. Severe backups would develop with vehicles trying to access I-5 in Tukwila and SR 167 in Renton. These backups would likely substantially reduce the volumes of traffic that could pass through the project area. Speeds would drop to less than 15 mph, making the length of a trip 33 minutes from Coal Creek Parkway to SR 169. HOV traffic would remain near the posted speed limit.

Build Alternative in 2030

With the proposed improvements to I-405, the freeway will carry between 2,600 and 6,600 vehicles in the evening peak hour. These southbound volumes will be more than double the traffic that could be handled if nothing is built. Many of the major bottlenecks will be removed and traffic will flow better. However, since backups from I-5 and SR 167 are assumed to still exist, persistent congestion will remain in the southbound direction in both the morning and the evening, and travel times will average around 28 minutes. These backups will be addressed in WSDOT's Master Plan improvements for I-405.

What is the reverse commute?

The reverse commute is commuter trips made in the opposite direction of the main flow of traffic.

What about the reverse commute?

The morning *reverse commute* (southbound) is substantially better than the northbound commute (see Exhibit 5.1-2). While the northbound morning commute from SR 169 to Coal

Creek Parkway takes almost 19 minutes, the southbound trip through the same area takes less than 7 minutes. However, traffic backups frequently occur on the section immediately to the south at the I-405 and SR 167 interchange. The congestion at the interchange often creates problems for southbound traffic further north. The traffic forecasting model indicates that the southbound morning traffic will continue to increase and congestion will worsen by 2014.

Similarly, in the evening, the northbound traffic flows are variable, depending on traffic conditions at I-90 and downtown Bellevue at the north end. By 2014, extensive congestion is forecasted throughout the evening commute period, resulting in travel times increasing from 7 minutes in 2002 to over 13 minutes in 2014.

The proposed project will greatly relieve the reverse commute traffic problems within the corridor. Relatively free-flow speeds can be expected southbound in the morning and northbound in the afternoon.

How will the project affect freight movements?

This section of I-405 is the most heavily-traveled freight corridor along the east side of Lake Washington. The additional lanes on I-405 will provide more capacity for freight movement throughout the day. Without the improvements, congestion would increase on I-405 and further affect the off-peak times when truck movements are heaviest. The *I-405 Corridor Program EIS* analysis indicated that improvements to the south section of I-405 will encourage trucks to use I-405 as the route of choice traveling to and from I-90.

What safety improvements will be included in the project?

In the Renton to Bellevue section of I-405, the overall accident rate for 2002 was 1.65 accidents per million vehicle miles, which is slightly higher than the average of 1.48 for the whole I-405 Corridor. The statewide average accident rate for urban freeways is 1.37. Most accidents on the mainline are rear-end-collisions. Additional roadway capacity northbound and southbound will improve safety by reducing stop-and-go traffic. Five on- and off-ramps to I-405 in this section are included in WSDOT's 2004 High Accident Location (HAL) Review. Accidents at these locations predominately occur at the intersection of the ramps with the cross arterials. Based on

WSDOT's accident review of the HALs, these accidents occur primarily because of high turning volumes to and from the ramps. Improvements to all eight interchanges in this section will be constructed to current standards to accommodate future demand volumes. These interchange improvements will have a positive effect on safety.

How will the project affect transit?

As part of this project, WSDOT is building infrastructure that will allow Sound Transit and/or King County Metro to implement bus rapid transit (BRT) within the I-405 Corridor. A new in-line transit station, HOV bypasses at general-purpose ramps, and HOV direct access on- and off-ramps will improve bus reliability by offering easier access to and from the HOV lanes. More buses, along with larger park-and-ride facilities, will contribute to higher ridership.

What measures are proposed to avoid or minimize effects on traffic during construction?

- WSDOT will prepare a traffic management plan before making any changes to the traffic flow. We will advise the public, school districts, and emergency service providers of the changes ahead of time through a public information process.
- Prior to and during construction, WSDOT will implement strategies to manage the demand on transportation infrastructure. These transportation demand management (TDM) strategies, such as support for the use of carpools, vanpools, and public transportation programs, will form an important part of the construction management program and will be aimed at increasing public awareness of their travel options in the corridor.

5.2 Noise

Noise is sound that can be perceived as unpleasant, unwanted, or disturbing. Noise levels are a consideration in transportation projects because noise from construction and operation of a roadway or other transportation facility can affect daily life. When transportation systems expand to add capacity, noise levels generally increase, which can interfere with conversations, work and family activities, and sleep. Prolonged or heightened exposure to intense noise can also result in hearing loss. The project team is working alongside local agencies and the public to evaluate and address traffic noise, ultimately lessening noise effects from the freeway.

Noise measurement in the project area

Please refer to the Renton to Bellevue Project Noise Discipline Report in Appendix H (on CD) for a complete discussion of the noise analysis.

How did we evaluate noise levels for the Renton to Bellevue Project?

WSDOT uses the Federal Highway Administration (FHWA) Traffic Noise Model to estimate traffic noise levels. To evaluate levels in the area, WSDOT obtained actual field measurements of current noise levels and current traffic volumes. We used the FHWA Traffic Noise Model to compare these data and to make noise projections for the future.

How noisy is the project area?

WSDOT measured noise levels at 53 sensitive receptor sites and modeled levels at an additional 89 sensitive receptor sites (for a total of 142 locations). From these measurements and modeling data, analysts concluded that current noise levels in the project area range between 49 and 77 A-weighted decibels (dBA). Further, current noise levels at 56 of the 142 sites either approach or exceed the FHWA noise abatement criterion of 67 dBA. WSDOT considers noise abatement measures when noise levels reach 66 dBA and above. These 56 sites represent about 230 residences and other noise-sensitive uses.

What is FHWA's noise abatement criterion?

If future noise levels with a project are predicted to approach or exceed the FHWA noise criterion at a sensitive receptor, then mitigation is evaluated at the receptor. For residences, the criterion is 67 A-weighted decibels.

A-weighted decibels measure how the human ear perceives sound.

How will project construction affect noise levels?

Construction will be completed in phases, with each phase having its own noise characteristics depending on the types of equipment being used. Roadway construction, for instance,

What are sensitive receptors?

Sensitive receptors represent all land use activity categories where the FHWA noise abatement criteria specify exterior and interior noise levels. Land use activity categories include residences, recreation areas, hotels, schools, churches, libraries, and hospitals.

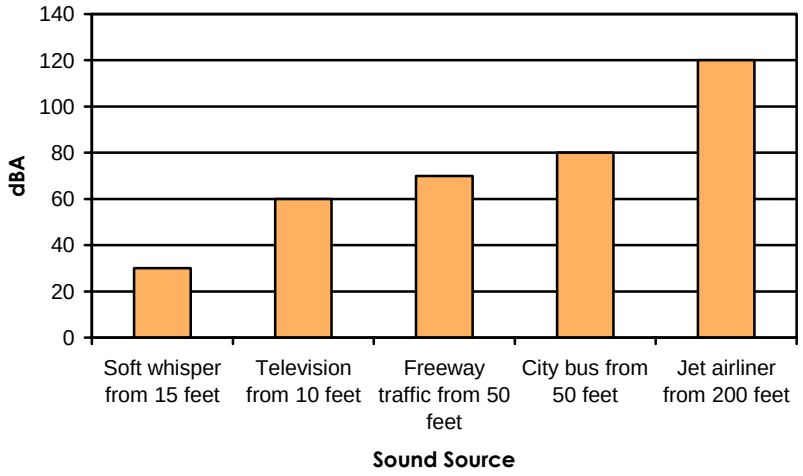
will involve clearing, cut-and-fill (grading), removing old pavement, and paving activities.

For the duration of the project, the most prevalent source of noise will be from engines. The loudest noises will be from high-impact equipment, such as jack hammers and pile drivers.

How will the completed project affect noise levels?

WSDOT compared projected future traffic noise levels to the FHWA noise abatement criterion to estimate traffic noise impacts for the proposed project. For all locations that exceeded the FHWA criterion, WSDOT evaluated the effectiveness of noise walls to reduce the noise. Typical noise levels are shown in Exhibit 5.2-1. Exhibit 5.2-2 describes specific locations for new and relocated noise walls in the project area, and Exhibit 5.2-3 shows on a map the locations where noise walls may be constructed or relocated. Although WSDOT evaluated noise walls at a number of locations, those that are being proposed are shown in Exhibits 5.2-2 and 5.2-3.

Exhibit 5.2-1: How loud are the sounds we hear?



To include a noise wall in a project, the wall must meet criteria for both feasibility and reasonableness. To be *feasible*, a noise wall must be constructible to achieve a noise reduction of at least 7 dBA at one or more sensitive receptors and a reduction of at least 5 dBA at most of the first row of sensitive receptors. To be *reasonable*, the wall must: a) be desired by the majority of those that would be affected by the wall; and b) must be cost effective by benefiting a sufficient number of receptors.

Exhibit 5.2-2: New and relocated noise walls

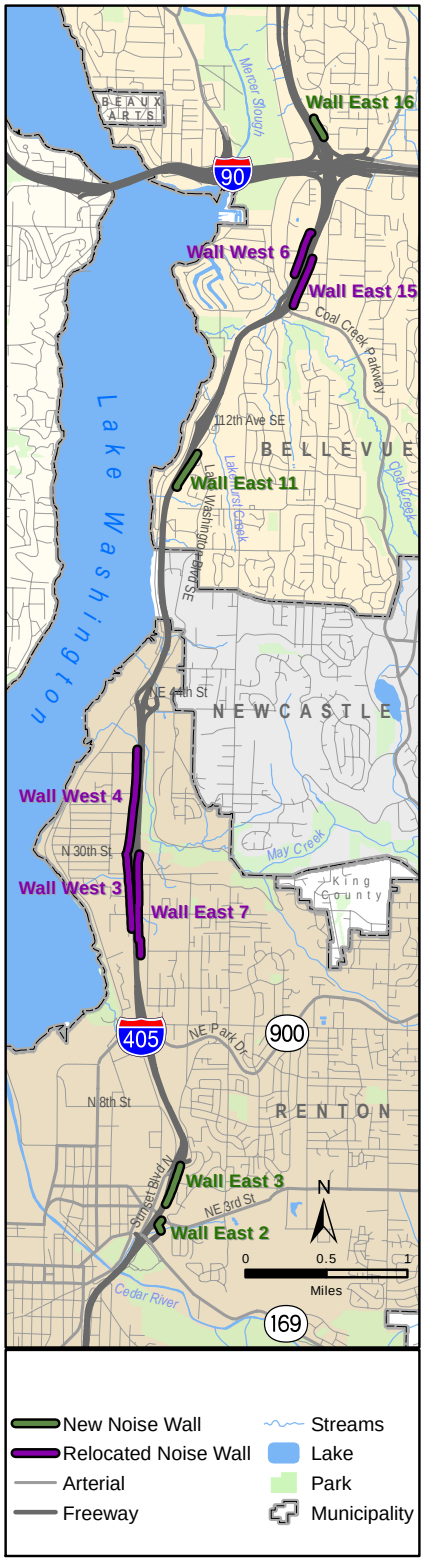
Identifier	Location	Height	Length
NEW WALLS			
Wall East 2	Between SR 169 ramps and NE 3rd Street	12 feet	300 feet
Wall East 3	Between Valmont Place NE and Sunset Boulevard	14 to 24 feet[1]	1,380 feet
Wall East 11	Between SE 60th Street and Lake Washington Boulevard SE	9 feet	1,380 feet
Wall East 16	Approximately 1,000 feet north of I-90	16 feet	725 feet
RELOCATED WALLS			
Wall West 3	Along Meadow Avenue N, south of N 30th Street	20 feet	2,360 feet
Wall East 7	Between NE 20th Street and Kennewick Place NE	14 feet	2,950 feet
Wall West 4	Between N 30th Street and N 40th Street	10 feet	3,300 feet
Wall East 15	Between SE 45th Place and SE 41st Place	14 feet	1,660 feet
Wall West 6	Vicinity of SE 41st Street to SE 39th Street	14 feet	1,490 feet

[1] The height of the northern portion of the wall can be lowered to 14 feet to reduce visual effects on adjacent residents.

The proposed noise walls will reduce noise levels at several residences that currently experience noise effects. Exhibit 5.2-4 shows the range of noise levels for both the Build and No Build alternatives at locations where WSDOT proposes to construct noise walls.

Severe noise impacts from projects occur when traffic noise levels exceed 75 dBA at sensitive receptors or when predicted future noise levels exceed existing levels by 15 dBA. Even with the proposed noise walls, two receptors will continue to experience severe noise impacts. Receptor 25 (on the west side

Exhibit 5.2-3: Noise wall locations



of I-405 about 0.1 miles south of the NE 44th Street interchange at milepost 7.4) represents two single-family residences with an existing noise level of 69 dBA that will increase to 75 dBA. It is located at the edge of a steep ravine, which prevents the construction of a barrier that will effectively reduce traffic noise at that site. Receptor CN (on the east side of I-405 about 0.3 miles south of the Coal Creek Parkway interchange at milepost 9.8) represents three residences in the vicinity of evaluated Noise Wall East 13, which was determined not to be reasonable because of the limited number of receptors it will benefit. The existing noise level of 72 dBA will increase to 76 dBA at this location.

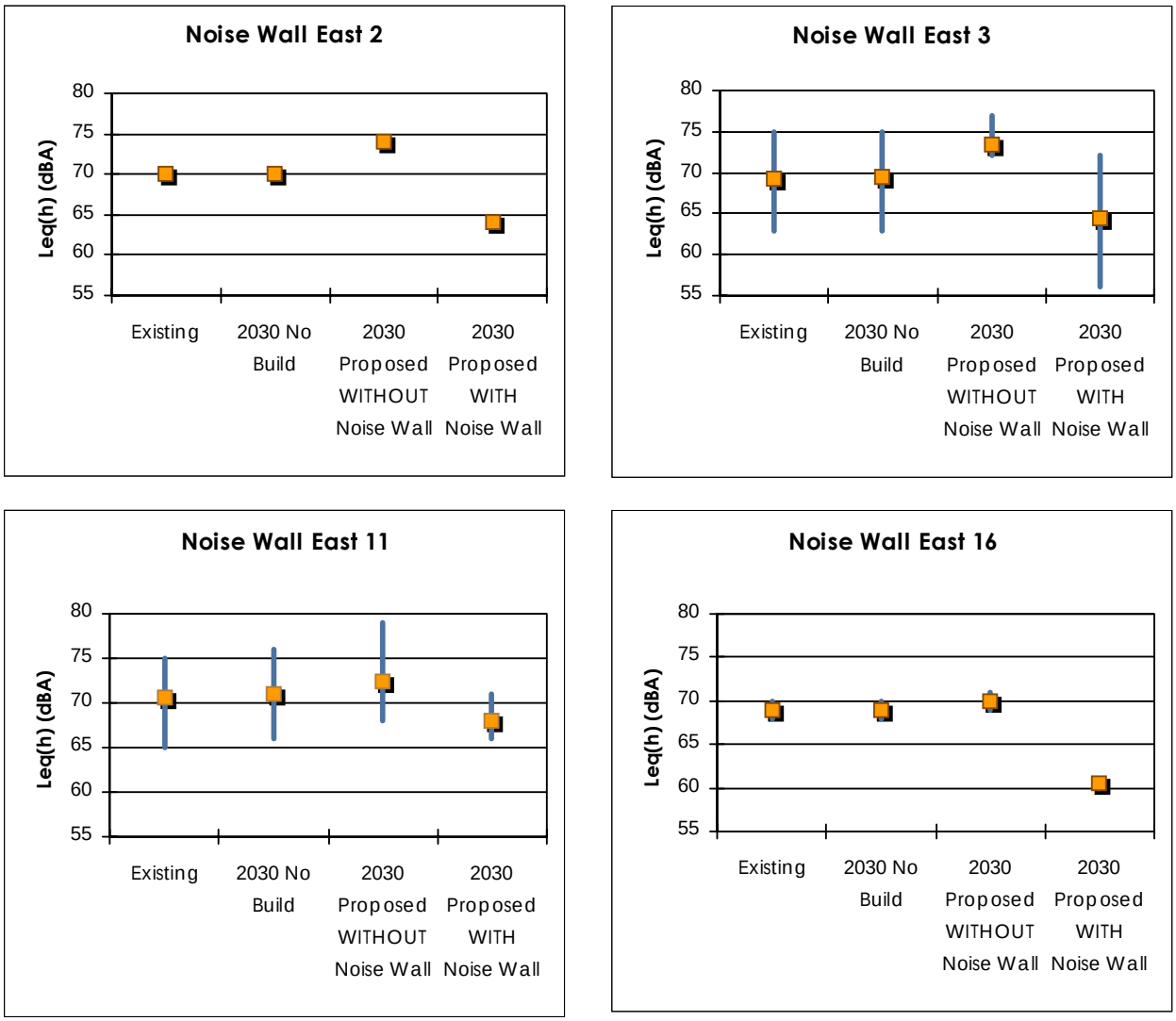
For the Build Alternative, our modeling indicates that without the recommended noise walls, noise levels will approach or exceed the noise abatement criterion at 78 sites (an equivalent of 392 residences). Noise levels at 52 of these 78 sites currently approach or exceed the FHWA criterion. The Build Alternative includes construction of nine noise walls that will reduce noise levels at 32 of the 78 sites compared to not building the walls. Of the nine new walls, five will replace walls that exist in the corridor. Noise levels at 54 locations will continue to approach or exceed the FHWA criterion as abatement measures are neither feasible nor reasonable.

Two receptors will continue to experience severe traffic noise impacts after project completion. Receptor 25 (on the west side of I-405, about 0.1 miles south of the NE 44th Street interchange at milepost 7.4) represents two single-family residences with an existing noise level of 69 dBA that will increase to 75 dBA. It is located at the edge of a steep ravine, which prevents the construction of a barrier that will effectively reduce traffic noise at that site.

Receptor CN (on the east side of I-405, about 0.3 miles south of the Coal Creek Parkway interchange at milepost 9.8) represents three residences in the vicinity of evaluated Noise Wall East 13, which was determined not to be reasonable because of the limited number of receptors it will benefit. The existing noise level of 72 dBA will increase to 76 dBA Leq(h).

Both of these sites are within 150 feet of I-405. While these sites will experience severe noise impacts, there will not be significant adverse noise impacts as a result of the project.

Exhibit 5.2-4: Noise levels at proposed new noise wall locations



Average noise level

Range of noise levels

***Note: At Noise Wall East 2, we used only one receptor to measure noise levels.*

Existing noise wall on I-405 near NE 30th

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

To reduce construction noise at nearby receptors, the following measures will be incorporated into construction plans and specifications:

- WSDOT will erect noise berms or barriers prior to other construction unless structures or features to support the berms or barriers need to be constructed first;
- WSDOT will limit the noisiest construction activities, such as pile driving, to between 7 AM and 10 PM to reduce construction noise levels during sensitive nighttime hours;
- WSDOT will outfit construction equipment engines with adequate mufflers, intake silencers, and engine enclosures to reduce their noise by 5 to 10 dBA (U.S. EPA, 1971);
- WSDOT will turn off construction equipment during prolonged periods of nonuse to reduce noise;
- WSDOT will require contractors to maintain all equipment and train their equipment operators in good practices to reduce noise levels;
- WSDOT will locate stationary equipment away from receiving properties to decrease noise;
- WSDOT will construct temporary noise barriers or curtains around stationary equipment that must be located close to residences;
- WSDOT will require resilient bed liners in dump trucks to be loaded on site during nighttime hours;
- WSDOT will require contractors to use Occupational Safety and Health Act-approved ambient sound-sensing backup alarms that can reduce disturbances at night.

What measures are proposed to avoid or minimize noise effects during operation?

- WSDOT will construct new noise walls at four locations provided that adjacent residents agree. We will also relocate five existing noise walls at or closer to the edge of the I-405 right of way (noise wall locations are shown in Exhibits 5.2-2 and 5.2-3).

5.3 Land Use Patterns

Land use planning helps to create and maintain vital communities with close-knit neighborhoods, a sustainable economy, protected natural systems, and an efficient public infrastructure. Balancing transportation and other land use needs through coordinated planning efforts help communities realize their visions. Local land use directly influences traffic patterns, which, in turn, help to shape the project design and development.

Bus at the Renton Transit Center

How do communities in the project area plan for growth, and how do these plans influence businesses and residences?

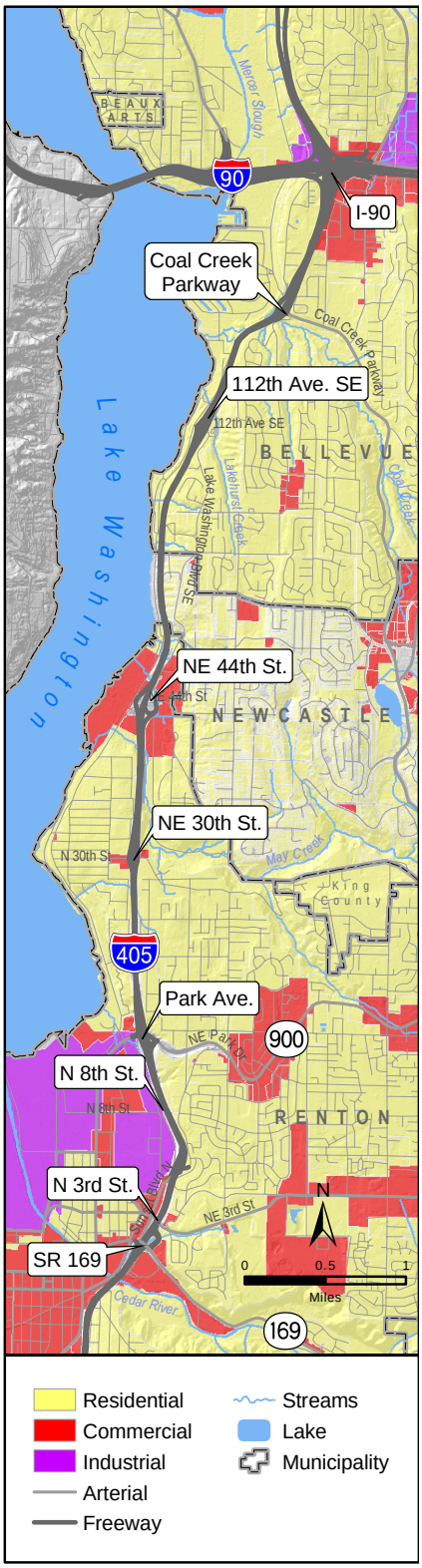
Many communities plan for growth at the citywide and neighborhood levels. Citywide planning documents, such as comprehensive plans and land use plans, provide overall policy guidance for future development and address topics such as land use, housing, parks and open space, public infrastructure, and the environment. Neighborhood plans allow for a detailed examination of issues affecting smaller geographic areas within the municipality. The cities of Renton, Newcastle, and Bellevue, as well as King County, have comprehensive plans that describe how their neighborhoods should evolve over time. Those same neighborhoods depend on the freeway, transit, and connecting arterial transportation systems that serve them. For these reasons, it is important that the Renton to Bellevue Project be consistent with community plans and that the community plans acknowledge the role of the transportation system in helping to accommodate planned growth.

As shown in Exhibit 5.3-1, the affected communities have planned for commercial land uses to occur at several of the I-405 interchanges. This is because visibility, ease of access, and the volume of pass-by traffic, are important factors to many businesses. People in nearby residential areas, however, desire low volumes of traffic on their streets. Higher commuter or cut-through traffic volumes on residential streets can create traffic congestion, as well as noise, air quality, safety, and parking issues within neighborhoods.

Please refer to the Renton to Bellevue Project Land Use Plans and Policies and Land Use Patterns discipline reports in Appendices I and J, respectively, (on CD), for a complete discussion of land use policies and analysis.

Bellevue incorporates, 1953
Image courtesy of the Museum of History and Industry - Seattle, Washington

Exhibit 5.3-1: Planned land use patterns



Will the proposed project affect adopted plans and policies?

Renton, Newcastle, Bellevue, and King County comprehensive plan policies support state highway improvements. The improved traffic circulation resulting from the Renton to Bellevue Project will help implement, and thus be consistent with, the cities' and King County's policies. Renton to Bellevue project improvements will also improve levels of service on I-405 and local streets. Minor inconsistencies were noted between municipal plans and the Renton to Bellevue Project, including: 1) rerouting of local streets may require Renton Comprehensive Plan improvements to functional classifications and bicycle improvement plans; 2) City of Renton includes improvements after 2022 in its capital improvements programs that are beyond the scope of the I-405 Program; and 3) Coal Creek underpass width may not allow for the City of Bellevue's planned full cross-section in the time horizon of the City's plan. Plan conflicts can be resolved through plan amendments in conformance with the Growth Management Act and other State laws. City and WSDOT level of service and concurrency review processes will assure that planned developments are accommodated by committed improvements. No unavoidable adverse effects related to land use plans and policies are anticipated for the project.

How can traffic patterns affect businesses and residences?

Changing traffic patterns can have positive or negative effects on business success and residential area appeal. The types of businesses in a commercial area may change in response to altered traffic patterns and accessibility. For example, a service station and a professional office generate different traffic patterns and have different needs for accessibility.

Land use in a residential area that experiences a high level of traffic may eventually change to a higher intensity use (i.e., multi-family residential, commercial, or a mix of the two). This type of change, however, can be influenced by other factors including economics, political climate, zoning, and comprehensive plan designations.

How will the project affect businesses and residences?

Noise, dust, vibration, glare, traffic detours, traffic delays, and visual disturbance will temporarily affect users of adjacent

properties and the local street system. Some businesses may be affected by disruptions to access. These temporary effects last only as long as construction is taking place and typically do not affect long-term land use development potential or development patterns. Traffic volumes on some residential streets in the project's proximity will temporarily increase because of traffic detours.

Permanent construction-related effects will result from converting private property to public ownership. Before construction, WSDOT will need to purchase property and, therefore, relocate some residences and businesses, and demolish existing structures. WSDOT will use acquired right of way for storm drainage facilities, noise mitigation, and roadway and transit improvements.

Existing land use in the project area will benefit as a result of transportation system improvements. WSDOT expects that the widening of I-405 will alleviate some of the vehicular congestion on adjacent local streets. Easier access and better traffic flow on I-405 will encourage commuters to use the freeway instead of seeking alternative routes on local streets.

What would happen if we did not build the project?

If the project is not built, growth would likely occur at a slower rate. Congestion and limitations in accessibility could cause businesses and related populations to locate elsewhere within the region.

5.4 Communities, Neighborhoods, and Businesses

Communities, neighborhoods, and businesses are the heart of a region's social identity and economic vitality. Studying and understanding the social and economic effects of the Renton to Bellevue Project is an important step to maintaining the area's unique characteristics, as well as nurturing its living and business environments.

Children playing in Cedar River Park

What economic and social data did we evaluate for the Renton to Bellevue Project?

WSDOT conducted analyses of regional and community growth, employment, housing, and the local business environment. In addition, we also evaluated potential project effects such as changes in travel patterns, accessibility to community facilities, and availability of affordable housing, on minority and low-income populations.

We used Census 2000 data to describe current socioeconomic characteristics of the population in the project area. Further, we tabulated information by the Puget Sound Regional Council's (PSRC) forecast analysis zones to characterize historical and projected characteristics. Since the size and shape of Census tracts and forecast analysis zones are irregular, the width of the study area on either side of I-405 varied to some extent in an effort to improve alignment with the data boundaries.

Please refer to the Renton to Bellevue Project Economic Elements, Environmental Justice, and Social Elements discipline reports in Appendices L, M, and N, respectively (on CD), for a complete discussion of these analyses.

Who lives in the project area?

The population within the Renton to Bellevue project area is becoming more diverse. Census 2000 data for the 78 block groups in the study area show that 73 percent of the population identified their race as "white alone" (Exhibit 5.4-1). While the population is predominantly white, more racial diversity is apparent today than in 1990. For comparison, Renton was approximately 17 percent non-white in 1990, while in 2000, that share rose to about 32 percent. Bellevue was approximately 13 percent non-white in 1990, compared with about 26 percent in 2000. This increased diversity provides the foundation for the interesting and healthy communities in the project area.

Exhibit 5.4-1: Project area by race

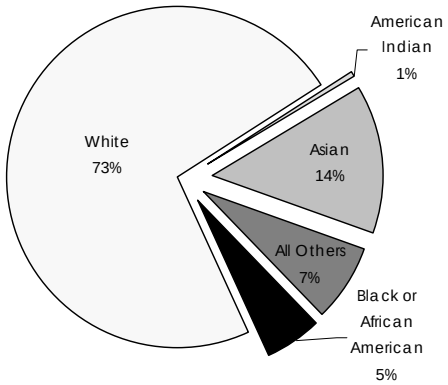
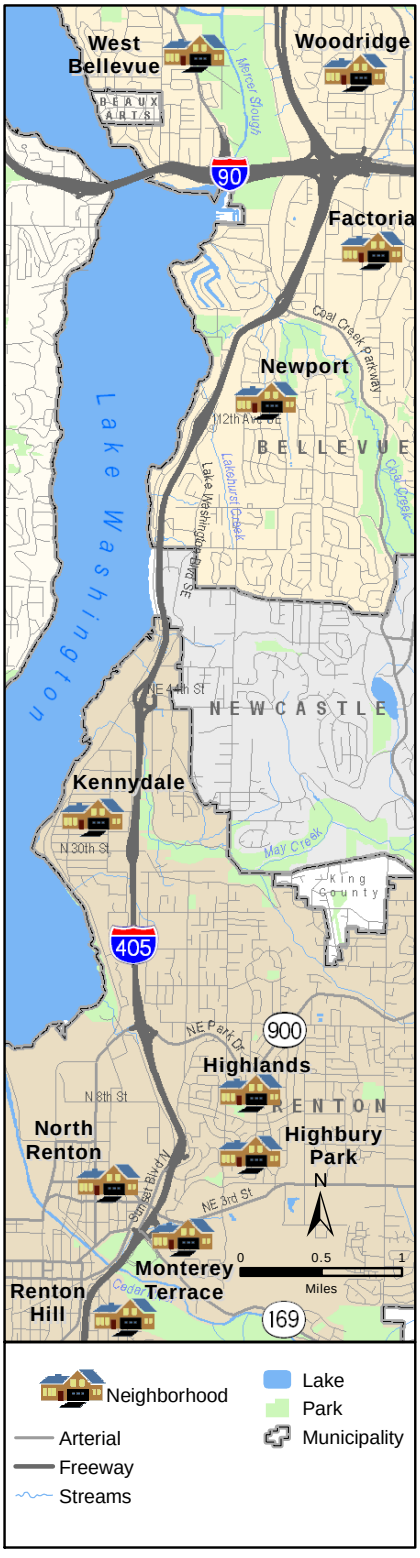


Exhibit 5.4-2: Neighborhoods



What community and social services are found in the project area?

Organizations such as neighborhood groups, youth service providers, business associations, social and recreational organizations, and service groups are all part of the community. Several public and private, non-profit health centers and clinics serve the community within the project area. Other agencies provide community assistance to persons in need.

Neighborhoods

Nine recognized neighborhoods, located within the jurisdictions of Renton and Bellevue, are adjacent to the I-405 mainline. Shown in Exhibit 5.4-2, these neighborhoods are: Woodridge, West Bellevue, Factoria, Newport, Kennydale, Highlands, Highbury Park, North Renton, and Monterey Terrace. These neighborhoods offer churches, schools, developed recreational facilities, parks, and undeveloped open space.

Population

Rapid population growth in the past decade has increased development pressures throughout the greater Seattle area of King County. Bellevue saw its greatest population growth rate from 1960 to 1970 when it increased by 378 percent. Over half of Bellevue's growth has resulted from annexation. With less area available for future annexation, the population growth rate is expected to decrease. Renton also saw its greatest population growth rate from 1960 to 1970 (a 40-percent increase). Exhibit 5.4-3 shows historical population growth in the project area.

Housing

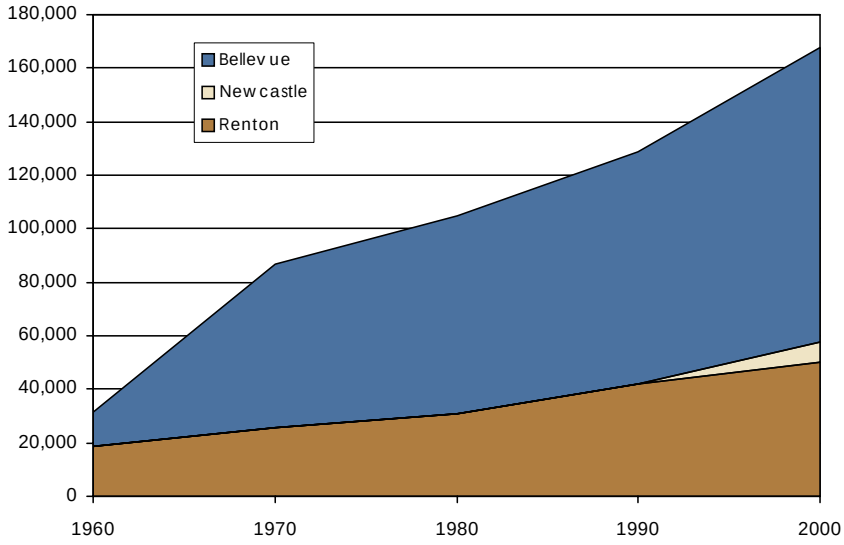
The Puget Sound region, particularly the Eastside, has a critical shortage of affordable housing (A Regional Council for Housing [ARCH], 2003 and 2005a). Typically, housing is considered "affordable" when no more than 30 percent of a household's income is spent on housing expenses. In order to provide a range of affordable housing types not adequately provided by market rate housing, cities will often encourage housing that is affordable to moderate or lower-income households. An "affordable housing unit" typically refers to housing that is within the budget of households earning 80 percent or less of the area median income (ARCH 2005b). The

King County Housing Authority and ARCH, have goals to preserve and increase the supply of housing for low- and moderate-income households in the area.

Mules and drivers, Renton Mine, circa 1910

Courtesy of the Museum of History and Industry – Seattle, Washington

Exhibit 5.4-3: Historical population growth



Note: The City of Newcastle did not incorporate until September of 1994.

In 2003, Renton had 12,588 single-family units and 12,213 multi-family units. Housing data for 1993 to 2000 indicate that during this eight-year period, 4,189 new residential units were permitted in the City of Renton. Given its current land supply and zoning, Renton has the capacity for 10,620 new housing units, zoned for single-family, multi-family, and multi-use residential.

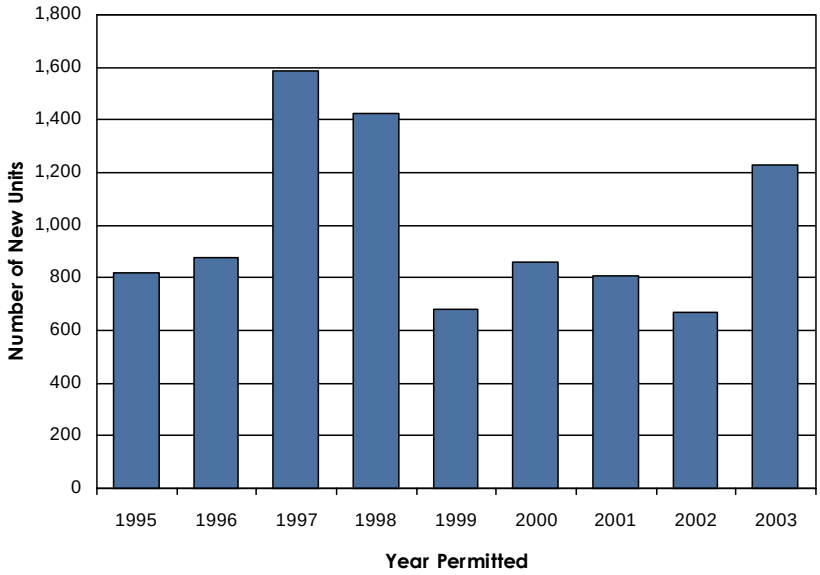
Boeing's Renton plant introduces the 707 jet, 1954

Courtesy of the Seattle Post-Intelligencer Collection, Museum of History and Industry – Seattle, Washington

In 2003, Newcastle had 2,528 single-family units and 893 multi-family units. During the 1993 to 2000 analysis period, 678 new units were permitted in the area that is now the City of Newcastle. Newcastle has capacity for 2,253 new housing units given its current land supply and zoning.

In 2003, Bellevue had 29,948 single-family units and 21,120 multi-family units. During the 1993 to 2000 analysis period, 4,727 new units were permitted in Bellevue. Bellevue has capacity for 15,753 new housing units given its current land supply and zoning. Total residential housing units permitted in the project area by year is shown in Exhibit 5.4-4.

Exhibit 5.4-4: Housing units authorized by permit in the project area



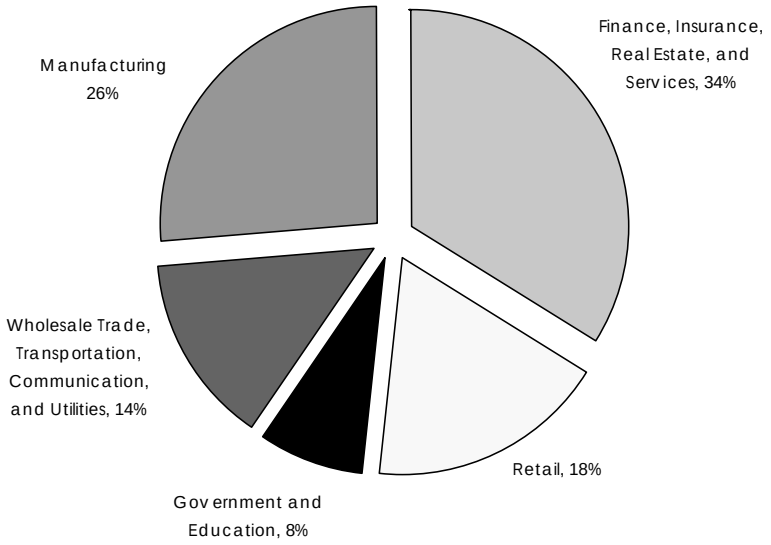
Business and Employment

Employment in the region is divided among several sectors that include: Finance, Insurance, Real Estate, and Services (FIRES); Manufacturing; Retail; Wholesale Trade, Transportation, Communication, and Utilities (WTCU); and Government and Education (Exhibit 5.4-5).

Renton is a well-established city with a diversified economy, yet it still depends highly on Boeing, the largest employer in the city, for jobs. Other major employers include PACCAR, Multiple Zones, Wizards of the Coast, and K&L Distributors. Data on employment changes from 1995 to 2000 indicate a 29-percent increase in the number of jobs (King County Buildable Lands Report [BLR], 2002).

Although Newcastle is primarily a residential community, it also offers employment and business opportunities. These include retail and business services, industrial and warehousing establishments, and regional recreation attractions. Data on employment changes from 1995 to 2000 indicate that Newcastle has achieved about 39 percent of its current 20-year target of 502 additional jobs.

Exhibit 5.4-5: Employment by sector



Source: Puget Sound Regional Council

Bellevue is the financial, retail, and office center of the Eastside, home to many businesses. The largest employers include Microsoft, Overlake Hospital, and Puget Sound Energy. The Bellevue Central Business District is a compact, mixed-use hub with places to live, shop, play, and work. Bellevue allows high-density residential development in the downtown area to facilitate its desire for a convenient, livable urban environment.

How will the project affect communities, neighborhoods, businesses, and minority and low-income populations?

The Renton to Bellevue Project will have minor effects on communities, neighborhoods, and businesses within the project area, and most of these effects will be beneficial. Context Sensitive Solutions design principles have been incorporated to help make the project fit aesthetically with the community. Periods of congestion will be shortened in the project area and the reconfiguration of the interchanges will make them operate more efficiently.

Communities and neighborhoods

WSDOT expects that community integrity will remain intact during both construction and operation of the Renton to Bellevue Project because neighborhoods in the vicinity of I-405 are already well established. Most effects to community cohesion will be widely dispersed across the 8-mile study area.

Kennydale, a longstanding Renton neighborhood

The Renton to Bellevue Project will require the full acquisition of 62 residential parcels. These effects will be permanent, but will not have long-term adverse effects on the character of the community.

Businesses

While several commercial parcels will be affected by the Renton to Bellevue Project in the form of full or partial acquisitions, we expect no long-term adverse effects on the community. Businesses will benefit from reduced congestion and improved accessibility, both of which will reduce the overall cost of doing business.

Minority and low-income populations

WSDOT conducted numerous outreach efforts to reach minority, low-income, and other special groups to convey information about the Renton to Bellevue Project. WSDOT analysts also examined the demographics of the study area. We concluded that the Renton to Bellevue Project will not have disproportionately high and adverse effects on minority or low-income populations, or resources and services that are especially important to them. The details of WSDOT's analysis can be found in the Renton to Bellevue Project Environmental Justice Discipline Report in Appendix M.

In the Renton to Bellevue project area, one of the primary concerns is the effects of construction. Most of these minority and low-income populations rely on transit facilities for daily needs. For them, I-405 is an essential piece of travel infrastructure. Because of this reliance, these individuals must deal with delays and other challenges from the current inefficiencies of I-405.

DID YOU KNOW?

The term ***environmental justice*** is relatively new; however, the issues related to the concept of fairness have been in public discussion for decades. Essentially, environmental justice is the simple, common sense notion that the negative environmental effects of projects should not disproportionately burden low income or minority communities. **Executive Order 12898**, issued by President Clinton in 1994, provides that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations."

How will construction activities affect communities, neighborhoods, and businesses?

Construction of the Renton to Bellevue Project is expected to last up to five years; however, construction activity in any one location will take substantially less time. Construction will pose some minor inconveniences because of localized travel delays, changes in some business access, possible parking reductions, and traffic re-routing. Some travelers may choose alternate routes to avoid construction activity. These detours and delays will be of short duration and highly localized; they will not affect social interaction or the economic vitality within local neighborhoods or the project area.

Will existing properties be acquired or displaced?

Right of Way and Easements

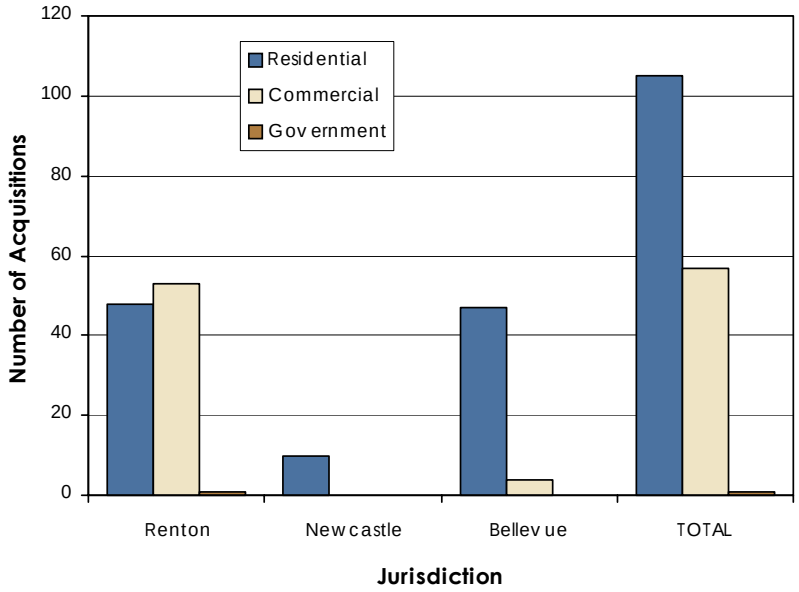
WSDOT will acquire approximately 44 acres of land for right of way. Most of this new right of way will be used to construct additional lanes on the I-405 mainline, reconstruct the interchanges, construct the transit/HOV direct access ramps, and realign local roadways. Additional properties will be acquired for environmental enhancements and stormwater facilities.

WSDOT estimates that the Renton to Bellevue Project will directly affect approximately 163 parcels (see Exhibit 5.4-6): 102 properties within the City of Renton (48 residential, 53 commercial, and 1 publicly-owned); 10 in Newcastle (all residential); 51 in Bellevue (47 residential and 4 commercial). The project will require the full acquisition of 62 residential and 19 commercial parcels.

What measures are proposed to avoid or minimize effects on communities, neighborhoods, and businesses during construction?

To reduce the effects of construction activities on neighborhoods and businesses, the following measures will be incorporated into construction plans and specifications.

Exhibit 5.4-6: Property acquisitions by type and jurisdiction



Communities and neighborhoods

- WSDOT will prepare and implement a traffic management plan (TMP). If local streets must be temporarily closed during construction, detour routes will be provided and clearly marked with signs.
- WSDOT will coordinate with the school districts before construction. The TMP will be implemented and coordinated with all emergency services organizations prior to any construction activity.
- WSDOT will coordinate with utility providers prior to construction to identify conflicts and resolve the conflicts before or during construction.

Businesses

- WSDOT will maintain access to businesses throughout the construction period.
- Because it can be difficult to determine whether a business is open, WSDOT will make provisions for posting appropriate signs to communicate the necessary information to potential customers.
- WSDOT will keep daytime street closures to a minimum.

Property Acquisition/Displacements

- In those situations where it is necessary to acquire property, WSDOT will conform to the requirements set forth in accordance with the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended and implemented by FHWA under 49 Code of Federal Regulations (CFR) Part 24, and according to Chapter 468-100 Washington Administrative Code (WAC) Uniform Relocation and Assistance and Real Property Acquisition. This will ensure just compensation for all properties and minimize any adverse effect on the current owners and residents. Relocation resources are available, without discrimination, to all eligible residents and businesses.
- WSDOT will prepare a relocation plan in advance of displacements. Additional information will be collected, possibly through property owner interviews, to identify the specific needs of any business that will be relocated.

DID YOU KNOW?

On January 2, 1971, Public Law 91-646, the **Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970**, (Uniform Act) was signed into law. The Uniform Relocation Act provides important protections and assistance for people affected by federally-funded projects. This law was enacted by Congress to ensure that people whose real property is acquired, or who move as a result of projects receiving federal funds, will be treated fairly and equitably and will receive assistance in moving from the property they occupy.

5.5 Recreational and Cultural Resources

Citizens appreciate recreational resources because they help improve the quality of life within our communities. Public spaces that are enjoyable, accessible, and diverse in their social and recreational functions enrich minds, bodies, and spirits.

Likewise, cultural and historic resources provide an important link to the past while establishing meaningful connections to lives today. They serve as symbols of a community's accomplishments and represent the distinctive architectural, landscape, and engineering designs of our region.

Newcastle Beach Park

Please refer to the Renton to Bellevue Project Section 4(f) Evaluation, and the Historic, Archaeological, and Cultural Resources discipline reports in Appendices O and P, respectively (on CD), for a complete discussion of these analyses.

How did we identify and evaluate recreational and cultural resources for the Renton to Bellevue Project?

WSDOT identified nearby recreational, historic, cultural, and archaeological resources within the Renton to Bellevue Project area. We identified nine recreational resources that were close enough to the proposed project to be evaluated for effects from construction or operation as part of our Section 4(f) and Section 6(f) analysis. Exhibit 5.5-1 shows the locations of these resources on a map of the project area. Exhibit 5.5-2 depicts these resources, their jurisdiction, and the types of recreational activities offered at each facility.

Our analysis examined the specific characteristics of parks adjacent to the project area and identified the construction activities that will take place near each facility. Further, we examined the likelihood of temporary construction or long-term operational impacts to the parks once the project is complete.

What parks are located in the project area and how will the project affect them?

The nine park resources we examined are shown in Exhibit 5.5-1 and identified by jurisdiction and type in Exhibit 5.5-2. Their physical features and amenities, along with potential effects, are described in greater detail on the following pages.

DID YOU KNOW?

Section 4(f) of the U.S. Department of Transportation (USDOT) Act of 1966, 49 USC 303 provides that the proposed use of any land from a major publicly-owned park, recreational area, wildlife and waterfowl refuge, or any important historic site, will not be approved by the USDOT unless a determination is made that there is no feasible and prudent alternative to the use of land from that property. The Act also requires that the proposed action include all possible planning to minimize harm that may result from such use.

Exhibit 5.5-1: Recreational resources

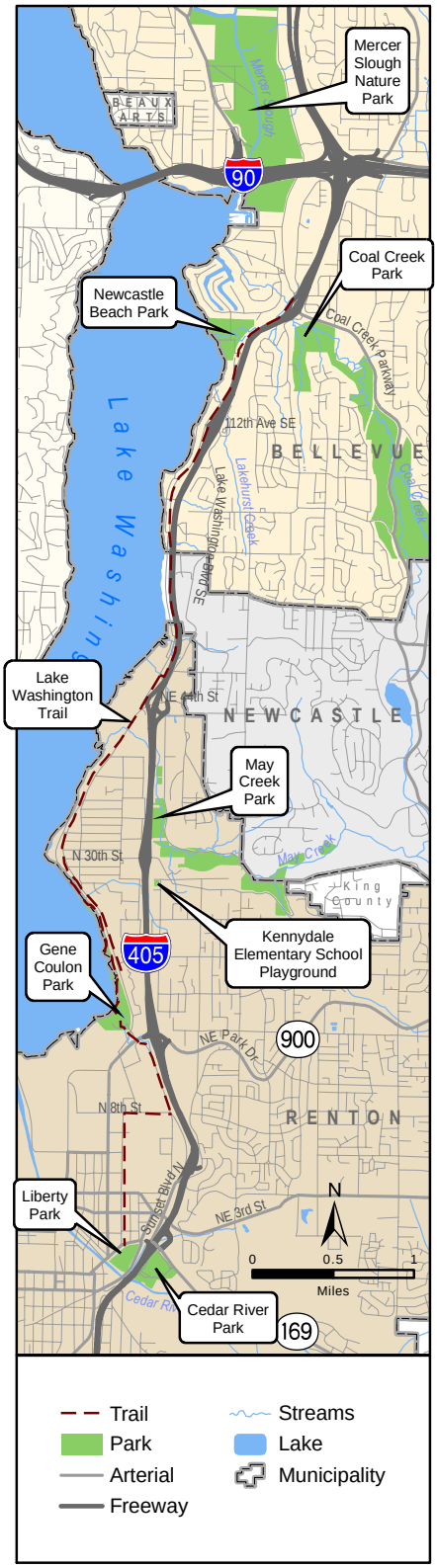


Exhibit 5.5-2: Recreational resources in the project area

Recreational Resource	Jurisdiction	Facility Type
Cedar River Park	City of Renton	Park
Liberty Park	City of Renton	Park
Gene Coulon Park	City of Renton	Park
May Creek Park	City of Renton, King County	Park
Newcastle Beach Park	City of Bellevue	Park
Lake Washington Trail	King County	Multi-use trail system
Coal Creek Park	City of Bellevue	Park
Kennydale Elementary School Playground	Renton School District 403	Playground
Mercer Slough Nature Park	City of Bellevue	Nature park and trail system

Note: Kimberlee Park is a private neighborhood park in the Newport Hills neighborhood in Bellevue. Because it is a private park, this park is not subject to the Section 4(f) review.

Cedar River Park is a 23-acre City of Renton community park situated between I-405 to the west, the Maple Valley Highway (SR 169) to the north, the Stoneway property to the east, and the Cedar River/Narco property to the south. The park was acquired in 1966 by the City of Renton. This park has many features including the Carco Theater, the Renton Community Center, the Henry Moses Aquatic Center, a park maintenance facility, ballfields, and 750 feet of shoreline on the Cedar River.

All project improvements in the vicinity of Cedar River Park will be constructed in the existing WSDOT right of way. While a flyover ramp from I-405 to SR 169 will be added north of the park boundary, any increase in noise and visual effects resulting from the project will not affect the park or its use appreciably. Further, National Ambient Air Quality Standards (NAAQS) will not be exceeded.

The Henry Moses Aquatic Center at Cedar River Park is popular in summer

Cedar River Park will experience no substantial construction effects. Projected noise levels and vibration during construction will not substantially interfere with the park's use and enjoyment. The project will neither substantially impair visual features of the park protected by Section 4(f) nor restrict access.

Liberty Park is Renton's oldest park facility. Since 1914, Liberty Park has continued to be the City's major park and playfield area. The park is located adjacent to the City's central core, between the Cedar River to the south, Houser Way to the east, and Bronson Way to the north and west.

All project improvements in the vicinity of Liberty Park will be constructed in the existing WSDOT or City of Renton right of way. While four additional lanes will be added on I-405 north of SR 169, any increase in noise and visual effects resulting from the project will not affect the park or its use. Further, NAAQS will not be exceeded.

Liberty Park will experience no construction effects. Projected noise levels and vibration during construction will not substantially interfere with the park's use and enjoyment. The project will neither substantially impair aesthetic features of the park protected by Section 4(f) nor restrict access.

Liberty Park

Gene Coulon Park swimming area

Newcastle Beach Park

Gene Coulon Memorial Beach Park is a popular 55-acre City of Renton regional park on Lake Washington.

WSDOT proposes to direct stormwater discharge from both I-405 flows and off-site flows to Johns Creek in this park. Construction will result in the intermittent partial closure of the southeast park entrance and the intermittent partial closure of the driving entrance to the park maintenance facility. Temporary fencing will be installed to ensure public safety during the construction period. While entering and leaving may be interrupted and/or delayed, the park entrance will remain open, and flaggers will direct general park traffic through the construction.

The park will experience no permanent adverse physical effects or interference with park activities or purposes; the land will be fully restored. WSDOT will not permanently acquire any Section 4(f) lands from this park.

Newcastle Beach Park is the City of Bellevue's largest park on Lake Washington. Opened in 1988, the 42-acre park features a large swimming beach, a fishing dock, a 0.75-mile loop nature trail, a large open grass area, picnic facilities, and a children's playground.

WSDOT will collect and treat all freeway drainage in the 23-acre highway tributary area using an ecology embankment BMP before directly discharging it to an unnamed tributary to Lake Washington within Newcastle Beach Park. During construction of stormwater piping, culverts, and the outlets to Lake Washington, WSDOT expects that there will be temporary interruptions of traffic for a short time. WSDOT will use flaggers to control traffic so that access to the park is maintained. While the outlet to the lake is being constructed, we will fence off the construction area for the safety of park users. None of these construction measures is expected to have an effect on the overall use and enjoyment of the park.

May Creek Park is made up of numerous parcels without contiguous ownership by public agencies. Ownership is a mix of City of Renton and King County. The parcels are undeveloped and are heavily vegetated with riparian vegetation and dense areas of blackberries, making them inaccessible.

Lake Washington Trail was constructed by WSDOT as a transportation facility during I-405 HOV lane construction in

the mid-1980s. The trail is a component of a regional, multi-use trail system that is presently only partially developed. The segments of the bikeway trail potentially affected by the Renton to Bellevue Project are fully contained within the WSDOT right of way. According to FHWA Section 4(f) Policy Paper, March 1, 2005, if a bikeway's purpose is primarily for transportation and it is an integral part of the local transportation system, the requirements of Section 4(f) do not apply.

Coal Creek Park is a 550-acre regional park and was a King County facility until April 2005. The City of Bellevue assumed ownership of this largely undeveloped park containing third-growth forest in a steep ravine, Coal Creek, and a fish ladder. Coal Creek Park features 3 miles of unpaved trail through a dense urban forest.

WSDOT will widen Coal Creek Parkway, an arterial immediately north of the Coal Creek Park boundary. For this purpose, WSDOT may obtain right of entry to approximately 10,000 square feet of park land along the park's northern edge to construct a multiple-use boardwalk (timber trail). This area is not usable recreation land and is characterized by very steep forested terrain. Added elements of the boardwalk approach may include an interpretive kiosk and a connection into the park from street level. The City of Bellevue has determined that construction of the boardwalk in a way that enhances the park will minimize, and may avoid, Section 4(f) impacts on the park (see Appendix E).

The projected noise levels and vibration during construction will not substantially interfere with the use and enjoyment of this facility. The project will neither substantially impair visual features of the park protected by Section 4(f) nor restrict access.

Mercer Slough Nature Park is a 320-acre City of Bellevue nature park that provides a wide variety of recreational uses. Mercer Slough is Lake Washington's largest remaining wetland.

All project construction in the vicinity of Mercer Slough Nature Park will be conducted in the existing WSDOT right of way. There will be no direct use of this park. While four additional lanes will be added on adjacent I-405, any increase in noise and visual effects resulting from the project will not

affect the park or its use appreciably. Further, NAAQS will not be exceeded. The project will neither impair aesthetic features of the park protected by Section 4(f) nor restrict access.

DID YOU KNOW?

Section 106 of the Historic Preservation Act requires federal agencies to account for the effects of their undertakings on historic properties and to afford the Advisory Council on Historic Preservation an opportunity to comment. FHWA and WSDOT also seek to ensure that each tribe with an interest in the project has the opportunity to identify and address any concerns regarding identification and evaluation of historic properties and potential effects of the undertaking upon such properties.

What historic, cultural, or archaeological resources are located in the project area?

To evaluate potential project effects on historic, cultural, and archaeological resources, WSDOT established an area of potential effects (APE) that was generally limited to the footprint of the project for analysis of direct effects and usually a city block beyond the right of way for indirect effects. Team historians reviewed historic and cultural resources site files maintained by the Washington State Department of Archeological and Historic Preservation (DAHP) and by the Cultural Development Authority (CDA) of King County. They also conducted field investigations to identify and document prehistoric and historic-period archaeological sites, as well as buildings and structures more than 50 years of age within the APE. Their research revealed three historical resources within the APE that are listed or have been recommended to be eligible for listing in the National Register of Historic Places (NRHP): George Griffin House, Sound Used Cars, and Columbia & Puget Sound Railroad. Their research also determined that there was one recorded archaeological site located in Cedar River Park and that construction at the NE 44th Street interchange is in the vicinity of ethnographically known Native American sites *Cbal*^{3}*t*^{u} and *PAH-sah-weh* near the mouth of May Creek.

What is the Area of Potential Effects (APE)?

This is an area in which historic properties, if they are present, could be affected by the project either directly or indirectly. For this project, the APE extends approximately 100 feet on either side of the I-405 mainline, interchanges, and other areas where construction is proposed.

Will the proposed project have an effect on historic, cultural, or archaeological resources?

No effects to historic, cultural, and archaeological resources are anticipated. The archaeologists' survey of the corridor revealed that large portions of the APE have been disturbed by past development. These disturbances include the construction of I-405 and its interchanges and ramps, as well as construction of residential and commercial properties. Due to the topography of the area, WSDOT's construction of I-405 required cutting of many hillsides along the corridor and filling and grading in other locations. Portions of Coal Creek, May Creek, and several unnamed creeks have been buried in culverts and rerouted. As a result, few remaining locations are

either sensitive for possible buried cultural materials or are likely to have retained integrity.

Letters of concurrence regarding the area of potential effects and on the effects analysis from the DAHP are included in Appendix E.

What measures are proposed to avoid or minimize effects to recreational, cultural, and archaeological resources during construction?

- WSDOT will prepare an Inadvertent Discovery Plan for the project that construction contractors will follow.
- During construction, WSDOT will conduct archaeological monitoring for work taking place in the vicinity of Cedar River Park, the NE 44th Street interchange, and near the mouth of May Creek.

What is an Inadvertent Discovery Plan?

An Inadvertent Discovery Plan is a step-by-step process for following state and federal laws and guidance should archaeological resources be encountered during construction.

5.6 Public Services and Utilities

Public services and utilities are an important consideration during the planning and construction of transportation projects because they affect the quality of human life. They allow people to live in a safer environment and enjoy a higher standard of living. If these services were to be interrupted, discontinued, or altered, such unanticipated inconveniences or emergencies could affect work schedules and other daily activities.

Renton Fire Department, Station, No. 11

How did we identify and evaluate public services and utilities for the Renton to Bellevue Project?

WSDOT evaluated possible service disruptions and access considerations, as well as changes in travel times associated with construction and future operation of the Renton to Bellevue Project. We used this information to determine whether the project would affect response times of emergency vehicles, travel for school buses, and people accessing other public services, such as medical clinics.

We conducted a review of existing utility locations and compared them against the proposed project footprint. We noted potential conflicts and described them by type and quantity. Using this data, we determined where potential utility service disruptions and access problems may occur.

Please refer to the Renton to Bellevue Project Public Services and Utilities Discipline Report in Appendix Q (on CD) for a complete discussion of the public services and utilities analysis.

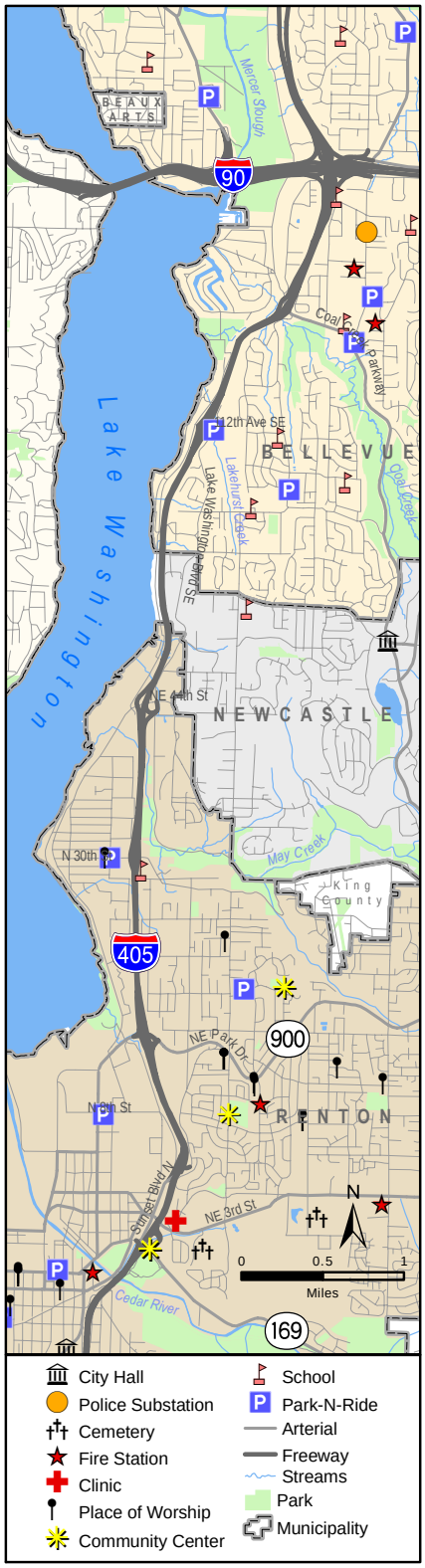
What public services and utilities are located in the project area?

Public services and utilities within the Renton to Bellevue project area are provided by a mix of local, regional, public, and private entities. Locations of public services are presented in Exhibit 5.6-1 and listed below.

Police – The cities of Renton and Bellevue, along with the King County Sheriff's Office and the Washington State Patrol, provide police protection to residents in this area.

Fire and Emergency Medical Services – The Renton Fire Department, the City of Bellevue Fire Department, and King County Fire District #25 provide fire protection within the project area.

Exhibit 5.6-1: Public services



School Districts – Renton School District #403 and Bellevue School District #405 provide educational services in the Renton to Bellevue study area.

Transit Services – Both King County Metro (Metro) and Sound Transit provide service in the Renton to Bellevue Project area. Metro serves Eastside communities and provides local and express service between major urban centers. In addition, Metro provides demand-response, Americans with Disabilities Act (ADA), paratransit, vanpool, and ride-matching services. Sound Transit provides high-capacity transit regional service via a series of express routes throughout the Renton to Bellevue study area and the greater Puget Sound region.

The number of buses operating in the corridor will continue to expand as described in King County and Sound Transit Development Plans. By 2030, Metro and Sound Transit will operate a total of 49 buses in the morning peak hour north of 112th Avenue SE. They will increase the number of buses north of NE Park Drive to 39 buses. The evening peak-period transit service is assumed to be the reverse of the morning peak period.

The addition of the in-line BRT station and HOV direct access on- and off-ramps at N 8th Street will allow buses to enter and leave the HOV lanes and will improve transit reliability. Riders using the park-and-ride lots will be served with minimal route deviation and delay.

Healthcare Services – Two regional medical centers provide Level III trauma services within the Renton to Bellevue project area. They include Valley Medical Center in Renton and Overlake Hospital in Bellevue. They represent two of only three facilities of this kind in King County. In addition, several public and private non-profit health centers and clinics serve these communities.

Utilities – Major water, sanitary sewer, storm sewer, electric power, gas, fuel, and telecommunications utilities currently serve the project area. These utilities are transmitted by both above- and below-ground lines.

Will any public services be displaced?

WSDOT will acquire approximately 3,300 square feet of land at the Kennydale Elementary School in order to relocate a noise wall. The school district is in the process of reconfiguring the school grounds and rebuilding the school.

WSDOT has been coordinating with the School District's architect to ensure that Renton to Bellevue Project improvements will not conflict with new design plans for the school. The architect has determined that the property acquisition will not affect the school reconfiguration.

School bus exiting I-405

Will the project cause any utility disruptions?

The Renton to Bellevue Project will have temporary and minor effects on utilities; however, any probable utility conflicts will be resolved, typically by relocating the utility prior to construction. Many utilities in the project right of way operate under an agreement with WSDOT that allows for their relocation at the expense of the utility provider.

Public works crew checking signal phasing

Will construction activities affect public services in the area?

How construction activities will affect neighbors and commuters is always a major concern for WSDOT. However, effects on services are expected to be minor during construction of the Renton to Bellevue Project. Travelers through the area can expect minor delays; transit, school buses, and emergency response vehicles may experience temporary route detours during some construction phases.

WSDOT's proposed construction will include improvements to eight interchanges. Construction, which is expected to last up to five years, is currently phased in a way that allows most access points and crossings (as well as three lanes in each direction) to be open during the entire construction process. However, temporary detours or lane closures through the construction zones are expected.

Most schools in the project area will not be affected, but some school bus routes may be altered or delayed. Overall, these effects are expected to be minor because the majority of the bus routes use arterial streets.

During construction, people trying to access public health and social service facilities in the project area may experience minor delays. Access to the Group Health Medical Center in Renton, within two blocks of the project, will be maintained during construction.

Once the project is built, the increased capacity on I-405 will provide an overall benefit to public services by improving

access to service locations and reducing response times for emergency vehicles. The project will also improve travel times for emergency vehicles during the peak periods when compared with the No Build Alternative.

What measures are proposed to avoid or minimize effects to public services and utilities during construction?

WSDOT will coordinate several efforts with local public services prior to and during construction of the project.

- WSDOT will prepare and implement a transportation management plan;
- WSDOT will post signs to show detour routes if periods of closures are needed;
- WSDOT will coordinate with school districts before construction;
- WSDOT will coordinate with all emergency services prior to, or during construction; and
- WSDOT will coordinate with utility providers to identify conflicts and resolve them prior to or during construction.

5.7 Visual Quality

When individuals view the environment during an everyday commute or on a first-time trip to the area, the visual characteristics strongly influence responses—positive and negative. Research has shown that most people will generally agree on which views have high or low visual quality. This chapter describes how WSDOT studied the visual quality of the Renton to Bellevue project area and examined how construction and operations will affect the views found within these local communities.

View looking west toward I-405 near I-90

How did we identify and evaluate visual resources for the Renton to Bellevue Project?

WSDOT conducted a visual impact assessment that evaluated both negative and positive visual effects of the project on the area's visual resources. These resources were identified based on a field reconnaissance of the I-405 Corridor, review of existing aerial photographs, and review of proposed design plans. Our evaluation used a subjective assessment of three criteria—vividness, intactness, and unity—which are "artistic" elements that are prominent in landscapes perceived as having high visual quality. During our evaluation, we incorporated proposed project improvements into the views looking toward and from I-405 to determine visual quality after project construction. Our analysis evaluated changes in visual resources as a result of the project and the likely viewer response to those changes.

Please refer to the Renton to Bellevue Project Visual Quality Discipline Report in Appendix R (on CD) for a complete discussion of the visual quality analysis.

How is visual quality determined?

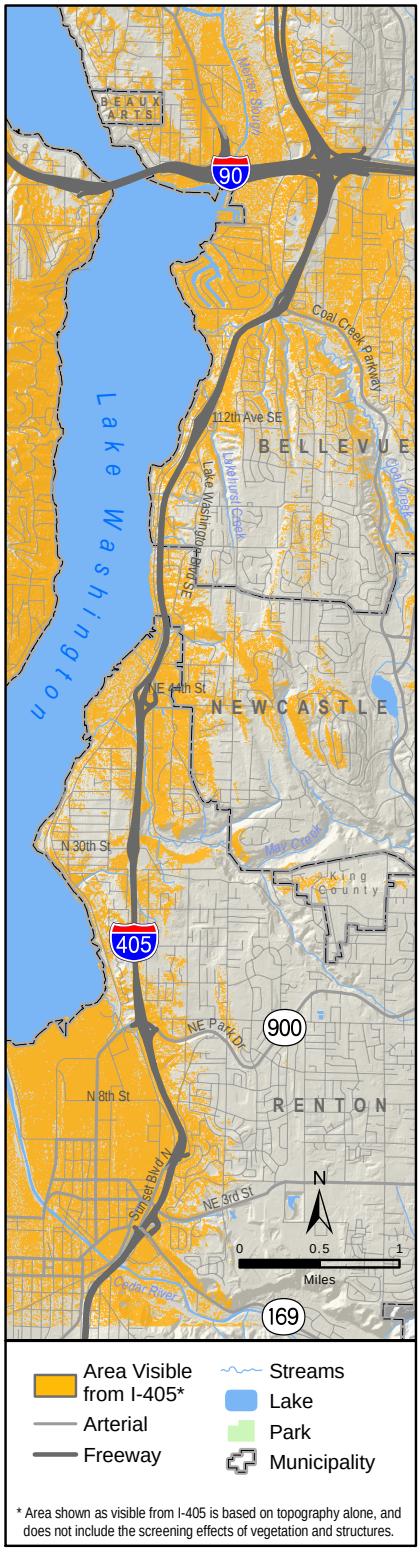
The project team determined the visual quality of existing views using three criteria.

- **Vividness** is the memorability of landscape components as they combine in striking and distinctive visual patterns.
- **Intactness** is the visual integrity of the natural and human landscape and its freedom from encroaching elements.
- **Unity** is the visual coherence and compositional harmony of the landscape considered as a whole (FHWA, 1981).

What views can we see within the project area?

The I-405 Corridor is located in a primarily urban/suburban landscape with some hillside segments of natural vegetation providing isolated forest landscape elements. From surrounding neighborhood roadways, views of the existing I-405 freeway are limited because of screening provided by topography and the existing land cover (such as vegetation and manmade structures). From the Cedar River bridge north to NE Park Drive, there is good visibility toward and away from I-405 with views of large industrial developments to the west and residential neighborhoods to the east (see Exhibit

Exhibit 5.7-1: Areas visible from I-405



5.7-1). Looking north of NE Park Drive, some houses and residential neighborhoods can be seen east of I-405, although the steep hillsides and vegetation limit visibility. Occasional views of Lake Washington can be seen to the west. While traveling southbound, highway users can see homes and other buildings along the lakeshore. There is greater visibility from and toward I-405 at the interchanges and at the northern end of the project area as I-405 approaches I-90. Some of these interchanges have views of strip shopping areas and other commercial or multi-family residential developments. The Factoria Mall and adjacent development, for example, are easily visible from I-405 at the northern end of the project area.

How will the project affect what people see?

Taken as a whole, the Renton to Bellevue Project will result in minor changes in the visual quality experienced by I-405 users and neighbors. Views from each perspective are discussed below. Exhibit 5.7-2 illustrates the before and after visuals of key project improvements. Project features depicted include the SR 169 flyover ramp, the N 8th Street direct access ramps, the Coal Creek Parkway overpass, and the Coal Creek Parkway to I-90 area braids.

I-405 users

Freeway users will experience increased complexity in what they see and a decrease in visual quality. The effects on visual quality will include increases in manmade development and encroachment – such as more pavement, more traffic lanes, more signs, more vertical walls and other transportation-related structures—thereby decreasing the visual integrity or intactness of the landscape. Further, much of the existing roadside vegetation, including many medium to mature trees, will be cleared for construction. The application of Context Sensitive Solutions (CSS), (please see the discussion on CSS later in this chapter), in the design and construction of the transportation-related structures will reduce the effects on visual integrity. The clearing of existing vegetation will be partially offset by landscaping added at project completion. Overall, the visual effect on highway users will be moderate to low.

I-405 neighbors

Many neighbors west of I-405 look uphill toward the freeway. Once project improvements are complete, these neighbors will see more of I-405, primarily raised structures such as retaining

walls, noise walls, and access ramps. Most neighbors east of I-405 are situated on plateaus and hillsides above the freeway and will experience little change in what they see from their neighborhoods. Neighbors close to any of the eight interchanges that will be reconfigured will experience some changes in visual quality. However, these changes will not be substantial within the existing landscape of primarily commercial and light industrial uses. There will be a moderate visual impact for users of Cedar River Park from the SR 169 flyover ramp. Overall, the effects on visual resources will be low.

What measures are proposed to avoid or minimize effects to visual quality during construction?

The Renton to Bellevue Project is being planned, developed, and designed in accordance with CSS guidelines. These guidelines provide an approach that incorporates community values and improves compatibility of the transportation facility with the communities and neighborhoods through which it passes. CSS also meets local, regional, and national requirements for the safe, efficient, and effective movement of people and goods. CSS considers the elements of mobility, safety, environment, and attractiveness throughout the project. Adhering to these guidelines, the Renton to Bellevue Project is being developed to fit its physical surroundings and to preserve scenic, visual, historic, and environmental resources.

The application of CSS guidelines precludes the need for further mitigating visual impacts. Because the project is being developed with local input, community concerns relating to appearance, environment, cultural resources, and other areas are being addressed early. Mitigation measures typical for transportation projects, such as retaining existing natural vegetation and planting new vegetation to screen manmade elements, are incorporated within the highway and related transportation features. Other areas subject to CSS include structural elements, landscape features, lighting, signage, and special elements such as parking structures and pedestrian bridges.

Exhibit 5.7-2: Selected views, before and after project construction

SR 169 flyover ramp area, BEFORE

SR 169 flyover ramp area, AFTER

Coal Creek Parkway overpass, BEFORE

Coal Creek Parkway overpass, AFTER

Coal Creek Parkway to I-90 area, BEFORE

Coal Creek Parkway to I-90 area, AFTER

5.8 Air Quality

Clean air is important to a community's wellbeing and the environment. Pollutants in the air can have negative effects on human health and cause harm to animals, plants, and materials. Emissions from cars, trucks, and buses are a major factor affecting air quality, particularly in urban areas. Maintaining good air quality will be important to freeway users, neighbors, and the community at large.

Mount Rainier, looking toward the project

How did we evaluate air quality for the Renton to Bellevue Project?

Regionally, the Puget Sound Regional Council evaluated the Renton to Bellevue Project as part of the I-405 Corridor Program in 2002. Air quality modeling results conducted at that time show that the Puget Sound Region, after making the corridor-wide improvements, will be in compliance with the Clean Air Act. However, some pollutants, such as carbon monoxide (CO), can have localized areas of high concentrations or "hot spots" under stable atmospheric conditions at locations where vehicles are stopped and idling, such as intersections. Therefore, WSDOT only evaluated how the Renton to Bellevue project improvements will affect air quality at specific locations (potential hot spots).

In our evaluation, we modeled two future years: 2014 and 2030. We selected the year 2014 (the year the project is scheduled for completion) to determine the project's effects on air quality when first completed; and the year 2030, to show the project's long-term effects.

Please refer to the Renton to Bellevue Project Air Quality Discipline Report in Appendix S (on CD) for a complete discussion of the air quality analysis.

What air quality issues affect the project area?

Under the federal Clean Air Act, the proposed Renton to Bellevue Project must be in compliance with National Ambient Air Quality Standards (NAAQS).

DID YOU KNOW?

The **Clean Air Act of 1970**, 42 USC 7401 et seq., was enacted to protect and enhance air quality and to assist state and local governments with air pollution prevention programs. Under the **Clean Air Act Amendments of 1990**, USDOT cannot fund, authorize, or approve federal actions to support programs or projects that are not first found to conform to Clean Air Act requirements.

DID YOU KNOW?

Under the federal Clean Air Act, the U.S. Environmental Protection Agency (EPA) has set **National Ambient Air Quality Standards** (NAAQS) that specify maximum concentrations for specific pollutants. Transportation projects must conform to the NAAQS by demonstrating that:

- the proposed project will not cause or contribute to any new violation of NAAQS;
- the project will not increase the frequency or severity of any existing violation of any NAAQS;
- the project will not delay timely attainment of the NAAQS within the region; and
- the project must not increase a CO reading in the design year (2030) over the CO reading in the existing year.

In addition to federal requirements, the Renton to Bellevue Project must conform to Air Quality Maintenance Plans (AQMPs) for ozone and CO that have been established for the Puget Sound Region.

Although the I-405 Corridor currently meets all NAAQS, vehicle emissions from heavy traffic congestion generates several air pollutants that are a concern in the project area—oxides of nitrogen (NO_x), CO, particulate matter (PM_{10})[1], ozone, hazardous air pollutants, and greenhouse gases, primarily carbon dioxide (CO_2). CO is the major pollutant of concern from combustion engines and can be readily modeled. CO impacts were modeled at several intersections because CO is the most closely tied pollutant to transportation and because it is an indicator for other pollutants.

NO_x and hydrocarbons contribute to ozone formation on a regional scale. Ozone, a component of smog, is an irritant, reduces lung function, and can damage plants and materials. CO is a colorless, odorless, and poisonous gas generated by automobiles that reduces the oxygen-carrying capability of the blood. The small particles can be inhaled deeply into the lungs, potentially leading to respiratory diseases. PM_{10} is an important concern during construction. Hazardous air pollutants, including a component of gasoline called benzene, may reasonably be expected to cause or contribute to irreversible illness or death. Automobiles and other vehicles using fossil fuel emit greenhouse gases, primarily CO_2 that trap solar energy in the atmosphere and warm the earth's surface.

How will construction affect air quality?

The Renton to Bellevue Project will cause localized and temporary air quality impacts. Typically, construction activities associated with roadway projects temporarily generate particulate matter (mostly dust), odors, and small amounts of other pollutants. Particulate emissions vary from day to day, depending on the level of activity, specific operations, and weather conditions. Thus, the quantity of particulate emissions during the project will be proportional to the area of the construction operations and the level of activity. Fugitive dust from construction activities will be noticeable near construction sites if uncontrolled.

Emissions during construction activities will be temporary, limited to the immediate area surrounding the construction

[1] This refers to particles less than 10 micrometers in size; it includes small dust particles and diesel particulate.

site, and will contribute only a small amount to the total emissions in the project area.

How will air quality change once the project is built?

Based on the results of modeling, WSDOT concluded that the Renton to Bellevue Project will not substantially affect CO concentrations in the project area.

WSDOT studied air quality at the three intersections with the highest traffic volumes and the most congestion (Exhibit 5.8-1). The modeled intersections include the intersections identified as being most likely to exceed the NAAQS for CO in the future with the Build Alternative. We used these intersections to model worst-case CO levels under existing conditions, as well as future conditions projected for both the proposed Build and the No Build alternatives.

Traffic volumes and congestion at ramp intersections will be slightly higher with the Build Alternative; therefore, our analysts modeled CO concentrations for some of the intersections at slightly higher traffic volumes with the Build Alternative than for the No Build Alternative (Exhibits 5.8-2 and 5.8-3). No exceedances of the NAAQS for CO are predicted at any of the three intersections and the project is not expected to have a substantial negative effect on localized CO levels.

What measures are proposed to avoid or minimize effects to air quality during construction?

The construction contractor will be contractually obligated to control fugitive dust in accordance with the Memorandum of Agreement between WSDOT and Puget Sound Clean Air Agency Regarding Control of Fugitive Dust from Construction Projects (October 1999).

The following measures will be used to control dispersion of dust (PM_{10}), transmission of particulate matter, and emissions of CO and NO_x during construction:

- WSDOT will spray exposed soil with water to reduce emissions of PM_{10} and deposition of particulate matter.

Grading to finish roadway subgrade

- WSDOT will cover truckloads of material susceptible to scattering by the wind, and materials in trucks will be wetted or provided adequate freeboard (space from the top of the material to the top of the truck) to reduce PM_{10} and deposition of particulates during transport.
- Wheel washers, rock aprons, or other measures will be provided to remove particulate matter that would otherwise be carried off site by vehicles to decrease deposition of particulate matter on area roadways.
- Dust deposited on public roads will be removed to reduce mud on area roadways.
- Dirt, gravel, and debris piles will be covered or wetted during periods of high wind when the stockpiles are not in use.
- Construction trucks will be routed and scheduled to reduce travel delays and unnecessary fuel consumption/emissions.

Exhibit 5.8-1: Intersections studied for air quality

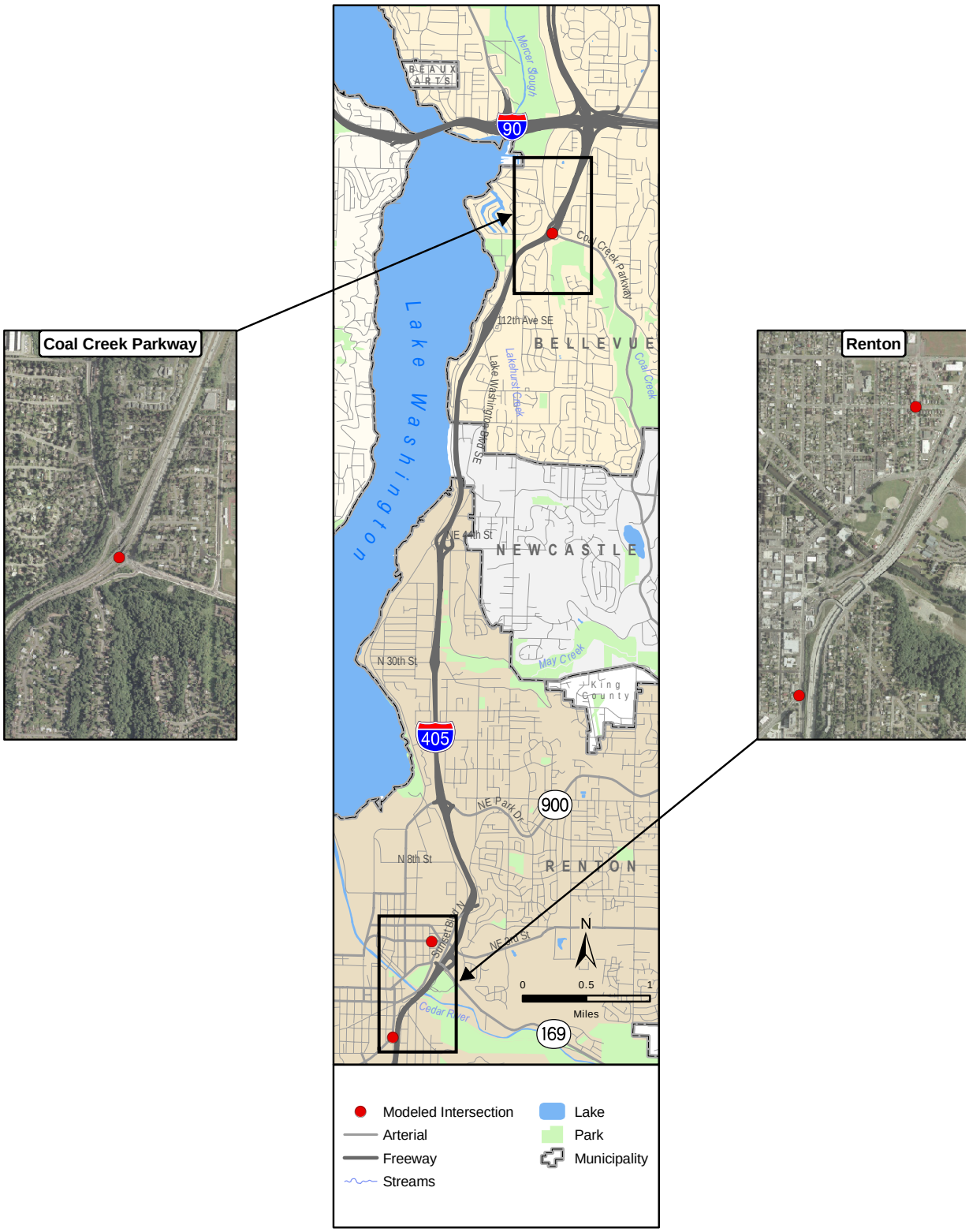


Exhibit 5.8-2: One-hour average CO concentrations

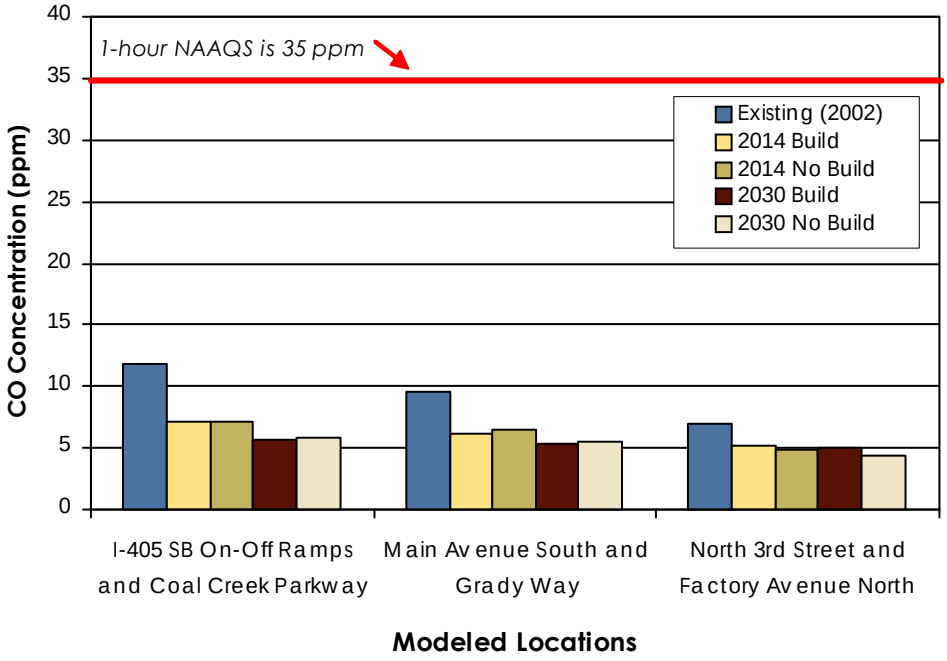
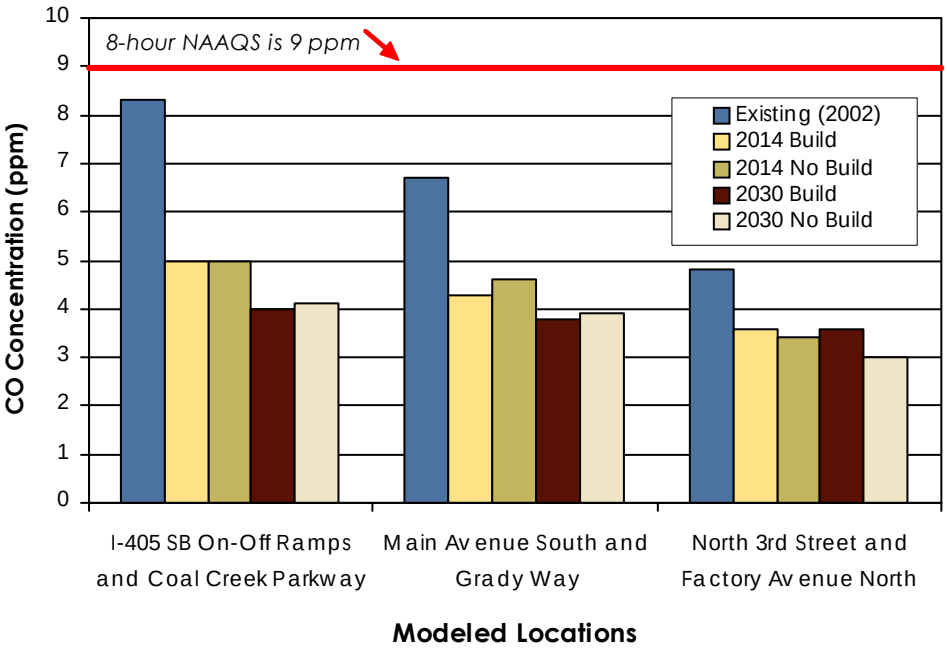


Exhibit 5.8-3: Eight-hour average CO concentrations



5.9 Water Resources

Water resources are essential to maintaining human health, fish and wildlife habitat, and vegetation. These resources can be affected by roadway projects because increased impervious surfaces can lead to changes in water movement, degrade the surface waters that drain to streams and, thereby, affect natural habitats. These changes can also influence flooding effects and groundwater recharge[1].

The Renton to Bellevue Project will benefit local water quality and baseline hydrology by treating almost twice as much impervious surface as the project will create.

Lower Clover Creek

How did we evaluate water resources for the Renton to Bellevue Project?

To identify water resources within the Renton to Bellevue project area, WSDOT scientists reviewed numerous maps and plans, geographic information system databases, aerial photographs, water quality studies, databases on point sources (such as pipes, ditches, channels, and wells), agency web pages, and other recent data.

Please refer to the Renton to Bellevue Project Water Quality; Surface Water and Floodplains; Water Quality; and the Geology, Soils and Groundwater discipline reports in Appendices T, U and Y, respectively, (on CD), for a complete discussion of water resources analyses.

What water resources are found in the project area?

Natural water resources typically include surface water (also in the form of stormwater), floodplains, lakes, wetlands, and groundwater. Within the Renton to Bellevue project area, a wide range of these resources exists.

Surface Water

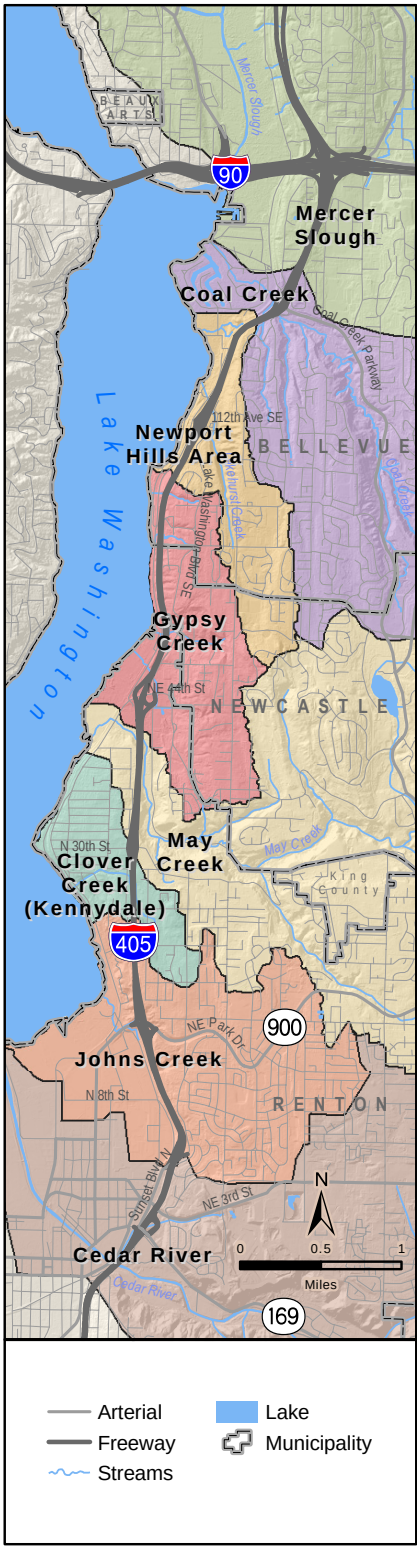
Surface waters are waters stored or flowing at the earth's surface including natural bodies of water (rivers, lakes, and wetlands), as well as water in manmade storage and conveyance facilities (lakes, detention ponds, and piped drainage systems). Discharges to these waters are regulated by the Clean Water Act.

DID YOU KNOW?

The Water Pollution Control Act, better known as the **Clean Water Act**, 33 USC 1251 et seq., provides for comprehensive federal regulation of all sources of water pollution. It prohibits the discharge of pollutants from non-permitted sources. In Washington, authority to administer the Clean Water Act is delegated primarily to the U.S. Army Corps of Engineers and the Washington State Department of Ecology.

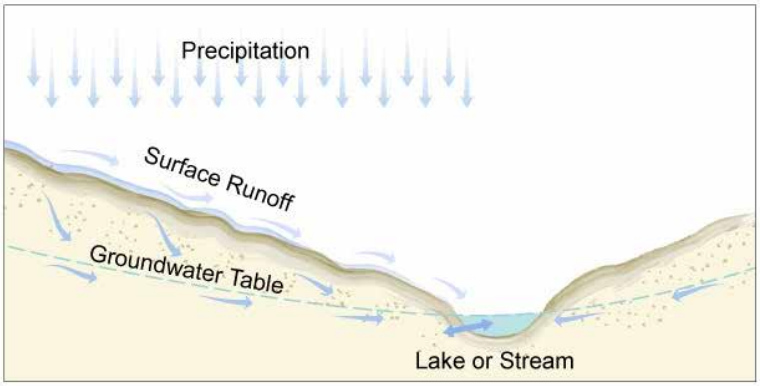
[1] The infiltration of water into the earth. Groundwater recharge may increase the total amount of water stored underground or only replenish supplies depleted through pumping or natural discharge.

Exhibit 5.9-2: Watersheds



Effects to surface waters can occur when pervious (permeable) areas are converted to impervious (hard, impermeable) surfaces such as pavement. When surface water, sometimes in the form of stormwater, cannot be absorbed by the ground, runoff volumes increase. Changes in runoff volumes and velocities can cause stream bank erosion, streambed scouring, and increased flooding risks (Exhibit 5.9-1).

Exhibit 5.9-1: How does water move across and below the ground?



The Renton to Bellevue project area includes eight watersheds[2]: Cedar River; Johns Creek; Clover Creek; May Creek; Gypsy Creek; Newport Hills; Coal Creek; and Lake Washington/Mercer Slough Wetland. The main streams crossing I-405 are Johns Creek, May Creek, and Coal Creek. The main receiving waters for the project are the Cedar River, Mercer Slough, and Lake Washington.

Additional small tributaries that drain to Lake Washington, which cross or run parallel to I-405 and receive runoff from within the project area, are also part of the project's affected environment. Exhibit 5.9-2 shows the area's watersheds.

Groundwater

There are two general aquifer systems that will be encountered along the I-405 Corridor: the "alluvial aquifers" and the Uplands Aquifer System. The alluvial aquifer system includes alluvium deposited along the various rivers, streams, and creeks bisecting the project corridor. Within the project area, the alluvial aquifer system includes alluvial deposits of the Cedar River, alluvial fan deposits of May Creek, and

[2] A geographic region within which water drains into a particular river, stream, or other body of water.

sediments along Coal Creek. These aquifers are unconfined systems. The most important of the alluvial aquifers is the Cedar Valley Sole Source Aquifer, the source of the City of Renton's water supply (see Exhibit 5.9-3). The depth to groundwater in the Cedar River alluvium is generally less than 25 feet. Groundwater in the May Creek alluvial aquifer is around 15 feet below ground surface, and groundwater in the Coal Creek alluvium is around 15 feet below ground surface where it crosses the Renton to Bellevue Project. The Upland Aquifer System is located in glacial and interglacial soils throughout much of the project area.

Groundwater flow in the North Upland Aquifer System is not well characterized; however, recharge is thought to be from infiltration of precipitation and septic drainage from residential development. The alluvial aquifers are unconfined systems.

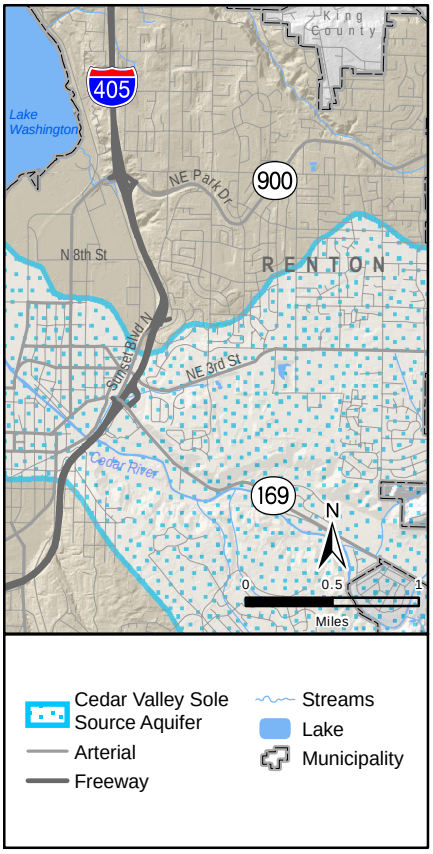
Floodplains

The Renton to Bellevue Project does not physically encroach on any existing 100-year floodplain designated as a Special Flood Hazard Area and will not affect downstream or upstream flood levels. The Renton to Bellevue Project will create no new stream crossings, although the locations of new cross-culverts under I-405 may change slightly. Each culvert and bridge that will be modified or replaced represents an opportunity to improve conveyance of floodwaters, and provide for fish passage. As a result, each structure is being designed so that negative effects on floodplains in the study area will be avoided.

How is stormwater from I-405 currently managed?

The existing I-405 roadway within the Renton to Bellevue project area has about 162 acres of impervious surfaces. Currently, the stormwater runoff drains to nearby streams or municipal storm drainage systems and ultimately to Lake Washington. Cross-culverts along the project corridor convey upstream (off-site) runoff from the east. These cross-culverts also convey some roadway (on-site) runoff to urban creeks, small watercourses and urban storm drains

Exhibit 5.9-3 Cedar Valley Sole Source Aquifer



What is a sole source aquifer?

EPA defines a sole or principal source aquifer as one that supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer. These areas can have no alternative drinking water source(s) that could physically, legally, and economically supply all those who depend upon the aquifer for drinking water. For convenience, all designated sole or principal source aquifers are referred to as "sole source aquifers."

What are best management practices (BMPs)?

Best management practices for stormwater are actions or structures that reduce or prevent pollutants from entering stormwater and degrading water quality. There are many different types of BMPs – some are treatment technologies, such as stormwater treatment ponds. Others are typical measures that can be implemented as part of a project, such as sweeping streets to eliminate debris. Some BMPs are permanent features of a project, others can be temporary measures used during construction.

What is a temporary erosion and sediment control (TESC) plan?

The TESC plan describes the measures to be used during construction to protect Waters of the State from degradation due to sediment transport or water pollution. These measures may include the use of temporary BMPs.

How will construction affect water resources in the project area?

The Renton to Bellevue Project is being designed to comply with WSDOT's *Highway Runoff Manual* and *Hydraulics Manual*. Best management practices from the *Highway Runoff Manual* have been incorporated into the design.

Construction activities are expected to include the building of new culverts, stream crossings, new storm drain systems, enhanced water quality treatment facilities, and paving. These activities will affect water quality and water quantity as described below.

Construction effects to water quality

Project construction may have minor effects on water quality of the small tributaries; however, the effects will be temporary. No long-term adverse effects on receiving streams or Lake Washington are anticipated.

WSDOT will prepare a temporary erosion and sediment control (TESC) plan and a spill prevention control and countermeasures (SPCC) plan prior to initiating construction. Implementing these plans will minimize erosion effects, decrease the sediments entering receiving waters from the construction area, and protect against effects from harmful material spills to streams.

Automotive-related substances, such as petroleum hydrocarbons and heavy metals, are another concern during construction. These substances can be found in staging areas, on temporary roads, or on other work surfaces such as the freeway. If discharged directly to surface waters, these contaminants can reach concentrations that are toxic to aquatic life. The SPCC plan will specify that equipment fueling and maintenance and storage of fuels and toxic materials can only take place away from drainage courses. The SPCC plan will also specify measures to be taken in the event of a spill.

Construction effects to water quantity

Construction of the I-405 crossings over May Creek and Coal Creek, and over other small watercourses and streams will require some in-water work during placement and/or removal of piers, columns, abutments, culverts, and riprap or other bank armoring. The in-water work can create temporary floodplain encroachments, which can affect flood levels if a large storm event were to occur during construction. After construction, the temporary encroachments will be removed. In accordance with applicable design guidelines, the temporary construction encroachments will be the minimum necessary to accomplish the work. WSDOT will not allow any in-water construction work to take place except during seasonal work windows established to protect fish, unless prior approval has been obtained from fisheries resource agencies.

There will be increased amounts of runoff during construction. Erosion and sedimentation control BMPs implemented during construction will help prevent downstream flooding, erosion, and sedimentation. The increased runoff will not have any appreciable effect on Lake Washington because of the lake's large size and volume in comparison to the small amount of runoff from the freeway. Other waterbodies that convey water to Lake Washington will each receive a small amount of flow from the construction areas. Each waterbody should have sufficient capacity to convey the flow without increasing flood risk.

What is a spill prevention control and countermeasures (SPCC) plan?

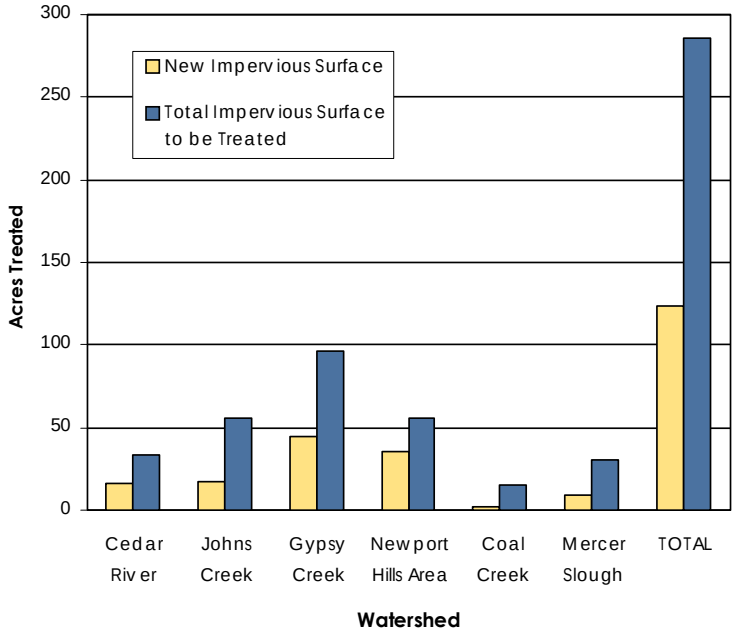
An SPCC plan is required on all WSDOT contracts regardless of project size. The plan includes planning and recognition of potential spill sources as well as response procedures and reporting requirements.

How will the project affect stormwater?

WSDOT will construct a new stormwater collection, conveyance, and water quality treatment system. Stormwater management improvements include off-site drainage crossings and the replacement of many of the existing culverts with new fish-passable culverts and structures. Many culverts and bridges will be resized to improve flow capacity to handle the increase in peak storm flows that has resulted from the urbanization of the watershed above I-405 since the freeway was built.

Compared with existing conditions, collectively, these changes will benefit the way surface water runoff from the project is managed (Exhibit 5.9-4). The Renton to Bellevue Project will

Exhibit 5.9-4: Stormwater treatment



improve water quality and conveyance and reduce some localized flooding potential.

What is enhanced water quality treatment?

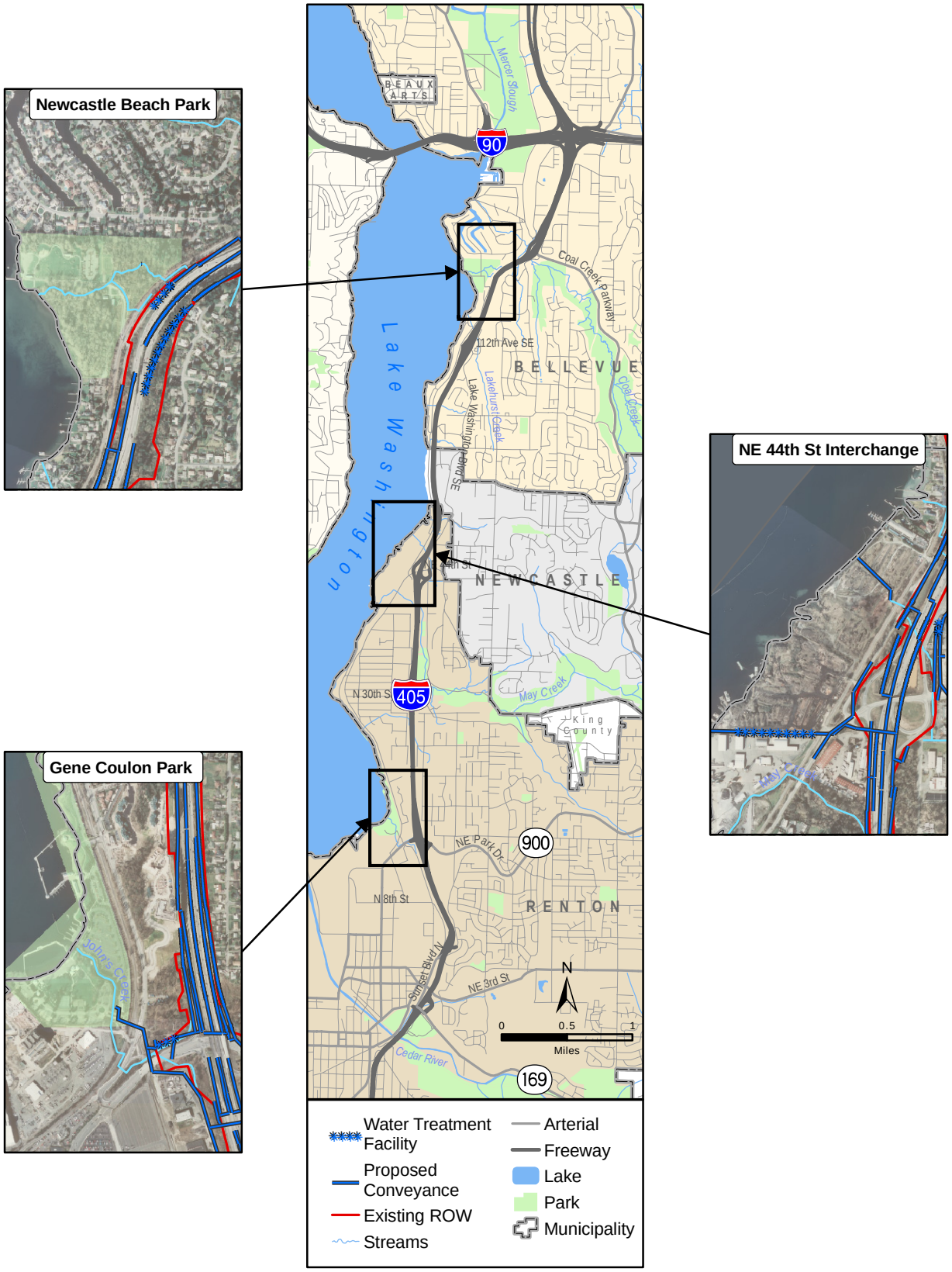
Enhanced water quality treatment is the use of BMPs to capture dissolved metals. The performance goal for enhanced treatment is 50-percent removal of certain metals.

The proposed project will include enhanced water quality treatment facilities consisting of ecology embankments. These facilities will provide enhanced treatment for the proposed 124 acres of new impervious surfaces, and 162 acres (a total of 286 acres or approximately 176 percent of new impervious surfaces within this portion of I-405) of presently untreated impervious surfaces (Exhibit 5.9 5).

Four pollutants (suspended solids, zinc, dissolved zinc, and phosphorous) are important because sufficient data exists on these constituents to estimate pollutant loads based on traffic volumes. Elevated levels of suspended solids are a concern because cloudy water can directly impair aquatic life. Suspended solids in runoff can also indirectly degrade downstream receiving waters because many other pollutants can absorb onto the particles.

Total and dissolved zinc represent heavy metals impacts. WSDOT also evaluated phosphorus because of its potential to increase oxygen depletion in streams and lakes. Fecal coliform, another pollutant associated with streams in the project area, is typically not associated with highway runoff.

Exhibit 5.9-5: Stormwater treatment facilities

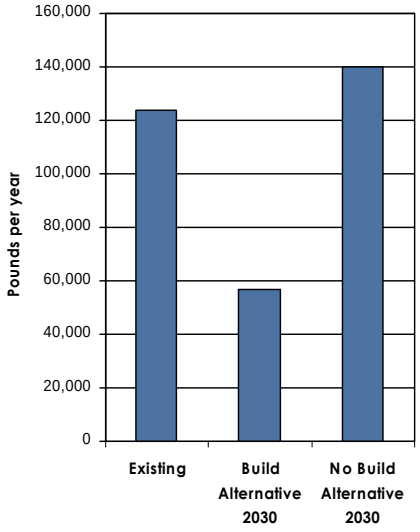


In-stream temperatures can also influence water quality. Temperatures above water quality standards are functions of ambient air temperature, surface area, stream volume, and shaded riparian cover. Stormwater runoff is generally a minor consideration affecting in-stream temperatures, since the vast majority of runoff events do not occur in summer or early fall when stream temperatures tend to be elevated.

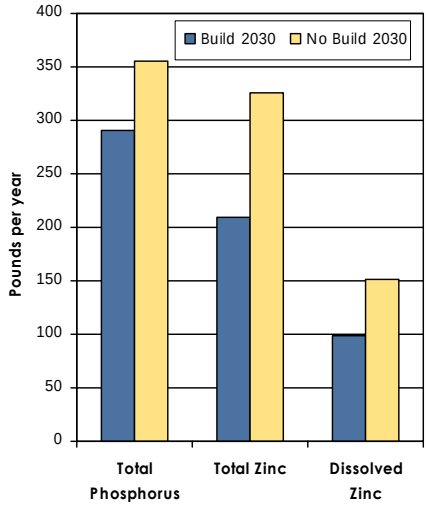
Overall, the proposed project will improve water quality with a net decrease in the annual pollutant loading of total suspended solids, total phosphorus, and zinc (Exhibit 5.9-6) because of the increased amount of water quality treatment provided by the project. Most notably, the proposed treatment will reduce pollutants entering the main receiving water, Lake Washington.

Exhibit 5.9-6: Pollutant loadings

Total suspended solids



Total phosphorus, zinc, and dissolved zinc



The proposed Renton to Bellevue improvements will increase the amount of impervious surface (pavement) in the area. Stormwater runoff from these surfaces will be discharged after treatment directly to surface water drainages, which will decrease the amount of rainfall currently infiltrating and recharging aquifers. The aquifers that can be most affected are the alluvial aquifers—the Cedar Valley Sole Source Aquifer, May Creek, and Coal Creek alluvial aquifers.

However, based on our preliminary estimates, this additional pavement will not present adverse effects. The amount of recharge that will be lost to any of these aquifers will be insignificant.

WSDOT has well-established design, operation, and maintenance practices for managing the type of soil, geologic, and groundwater conditions anticipated along the project corridor. Thus, long-term effects are expected to be minimal and consistent with other projects of this type. The amount of recharge that will be lost to the Cedar Valley Aquifer from the additional impervious pavement of about 16 acres over potential recharging areas is about 18 gallons per minute (gpm). When comparing the Cedar Valley Aquifer yield to the City's wells of about 9,000 gpm, this reduction in recharge quantity effect is minimal.

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

Several measures will be incorporated into construction plans and specifications to reduce effects to water resources.

- WSDOT will protect groundwater with the use of standard BMPs.
- WSDOT will prepare and implement a temporary erosion and sedimentation control plan and a spill prevention control and countermeasure plan.
- WSDOT will not allow any in-water construction work to take place except during seasonal work windows established to protect fish, unless prior approval has been obtained from fisheries resource agencies.
- WSDOT will identify and develop staging areas for equipment repair and maintenance away from all drainage courses. Washout from concrete trucks will not be dumped into storm drains or onto soil or pavement that carries stormwater runoff. Thinners and solvents will not be used to wash oil, grease, or similar substances from heavy machinery or machine parts. WSDOT will designate a washdown area for equipment and concrete trucks.
- WSDOT will ensure that fuel and chemical storage, fueling operations for construction vehicles, and equipment during construction is located within

secondary containment areas. These areas will be surfaced with an impermeable material and sized to contain the volume of stored fuel and/or chemical.

- WSDOT will locate spill response equipment at regular and specified intervals along the project alignment.
- WSDOT will identify and develop staging areas for equipment repair and maintenance away from all drainage courses.
- WSDOT will take added measures during construction within the Cedar Valley Sole Source Aquifer to protect the aquifer, such as prohibition of fuel and chemical storage and refueling operations. Also, construction specifications will require stormwater collection with either a lined or piped conveyance system within the Aquifer Protection Area (APA). Stormwater will be directed and discharged outside of the APA to prevent any possible degradation of water quality.
- WSDOT will conduct construction within the City of Renton's APA Zones 1 and 2, in compliance with Washington State Wellhead Protection Requirements outlined in WAC 246-290-135(4) and the City of Renton Municipal Code RMC 4-9.
- WSDOT will ensure that fuel and construction chemicals will not be stored within the City of Renton's APA Zone 1 and minimize storing fuels and chemicals within Renton's APA Zone 2.
- WSDOT will conduct groundwater monitoring to monitor for spills that can affect the Cedar Valley Aquifer. If necessary, existing City of Renton monitoring wells can be supplemented with additional monitoring wells at key locations and used for monitoring water quality during construction activities in the APA Zone 1.
- WSDOT will ensure that any fill over 50 cubic yards in quantity placed over Renton's APA Zone 1 be certified by a professional engineer or geologist that the fill meets Model Toxics Control Act (MTCA) cleanup standards.
- WSDOT will not place imported contaminated fill during construction.

- WSDOT will ensure that imported fill meets MTCA Method A or B soil cleanup standards (WAC 173-340-740) for unrestricted use.
- WSDOT will develop a fill evaluation and testing plan prior to commencing construction activities. The fill testing plan will also apply to suspect excavated soils encountered during construction.
- If analytical testing is required, WSDOT will ensure that imported fill soils are analyzed before arriving at the construction site.
- WSDOT will ensure that all sampling is performed by a professional engineer or geologist.

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

- Stormwater discharge to the Cedar River will be downstream of the City of Renton's RW-1, 2 and 3 Group A wells.
- WSDOT will construct new I-405 roadway over the Renton APA Zone 1 with an impervious liner underneath the pavement for additional protection from spills escaping the stormwater collection system.
- WSDOT will ensure that fuel and chemicals spills from vehicles are captured and contained by the stormwater collection and detention system. The stormwater system will detain spills in either vaults or ponds. The detention vault or pond will have shut-off capability for containing a spill or release.
- WSDOT will establish a plan in compliance with Washington State Wellhead Protection Requirements outlined in WAC 246-290-135(4) and the City of Renton Municipal Code RMC 4-9 to ensure a higher level of protection for the City of Renton's APA Zones 1 and 2.
- Within APA Zones 1 and 2, WSDOT will construct either a lined or piped stormwater conveyance system. Stormwater will be directed and discharged outside of the City of Renton's APA Zone 1 Wellhead Protection Area.
- WSDOT will ensure that the roadway and access ramps over Renton's APA Zone 1 will have berms to

collect and route major spills to the stormwater collection system. The system will be constructed in accordance with City of Renton requirements for sanitary sewage facilities in APA Zone 1 areas and will be sized to contain a liquid spill from a double tanker.

- WSDOT will control stormwater so that peak and base flows of receiving waters are not adversely affected by treated stormwater discharge from the expanded impervious surface areas created by the project.

5.10 Wetlands

Wetlands are a valuable resource to our environment. They can help moderate stormwater flows by slowing down and retaining flood waters during periods of rain. They can also help reduce flooding downstream and remove dirt and pollutants from the water. Wetlands may also provide vital habitat for many plants and animals.

Roadside wetland

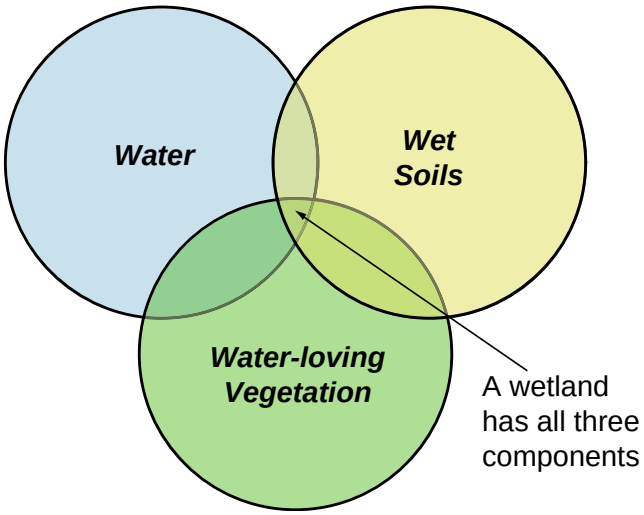
How did we identify wetlands in the Renton to Bellevue project area?

WSDOT biologists conducted literature reviews and field investigations using methods defined by the Washington State Wetlands Identification and Delineation Manual (Ecology, 1997) to determine wetland boundaries and characteristics. This method is in agreement with the U.S. Army Corps of Engineers' method (1987).

Wetlands are made up of three components, as shown in Exhibit 5.10-1, and are categorized according to their quality.

Please refer to the Renton to Bellevue Project Wetlands Discipline Report in Appendix V (on CD) for a complete discussion of the wetlands analysis.

Exhibit 5.10-1: Components of a wetland



What wetlands are located in the project area?

There are several types of wetlands located in the project area. WSDOT biologists classified wetlands in the study area according to the Cowardin classification system. This system bases the classification of wetlands on their physical

characteristics, such as the general type of vegetation in the wetland (trees, shrubs, grass or forbs, etc.) and how much, and where, water is present in the wetland. Relatively few types of wetlands are present in the project area. WSDOT biologists assigned each wetland to one of the following Cowardin classes: palustrine emergent (PEM), palustrine scrub-shrub (PSS), and palustrine forested (PFO). Exhibit 5.10-2 illustrates the various wetland types in the project area.

Sixty-three wetlands are located in the project area (see Exhibit 5.10-3), totaling approximately 20 acres. Most of the wetlands (52 of 63 wetlands) are relatively small (less than 0.3 acres). All of the wetlands are either Class IV (low functional level, often heavily disturbed) or Class III (moderate functional level, previously disturbed wetlands); none of the wetlands in the project are Class II (high functional level, difficult to replace) or Class I (unique or rare wetlands, relatively undisturbed).

How will the construction activities affect wetlands?

Construction activities such as vegetation removal and short-term placement of fill material will have temporary effects on roughly 0.6 acres of wetlands in the project area.

WSDOT anticipates that construction will require at least 10 feet beyond the grading limits during construction for space to turn and move about. Within this space, machinery may disturb wetlands and possibly cause dirt to mix with water from the project and spill into the wetlands. We do not expect these effects to result in a complete loss of wetlands once the project is completed and disturbed vegetation or wetland hydrology is reestablished.

Construction effects will vary depending on the intensity of the temporary effect. Wetlands where the vegetation will be cleared or trimmed will still retain some water quality and quantity function, although at a diminished level. Filled wetlands will provide no beneficial functions until they are restored. Wetlands temporarily affected during construction will be restored to their pre-existing conditions following the completion of work, and it is anticipated that they will return to a functioning state within five years.

Exhibit 5.10-2: Wetland types found in the Renton to Bellevue project vicinity

PEM wetland

Palustrine Emergent Wetland (PEM)

In the USFWS classification system (Cowardin et al., 1979), these wetlands are characterized by erect, rooted, non-woody plants.

PSS wetland

Palustrine Scrub-Shrub Wetlands (PSS)

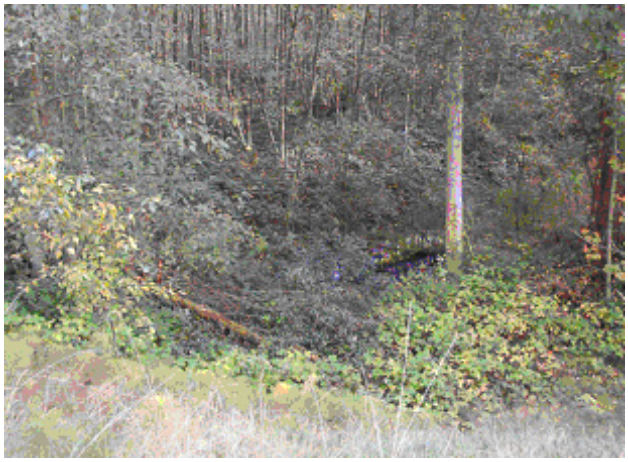
In the USFWS classification system (Cowardin et al., 1979), these wetlands are areas dominated by woody vegetation less than 20 feet tall, such as trees, shrubs or young trees that are stunted due to environmental conditions.

PFO wetland

Palustrine Forested Wetlands (PFO)

In the USFWS classification system (Cowardin et al., 1979), forested wetlands are characterized by woody vegetation that is 20 feet tall or taller.

Exhibit 5.10-2: Wetland types found in the Renton to Bellevue project vicinity (continued)



Palustrine Forested Wetlands (PFO) - continued

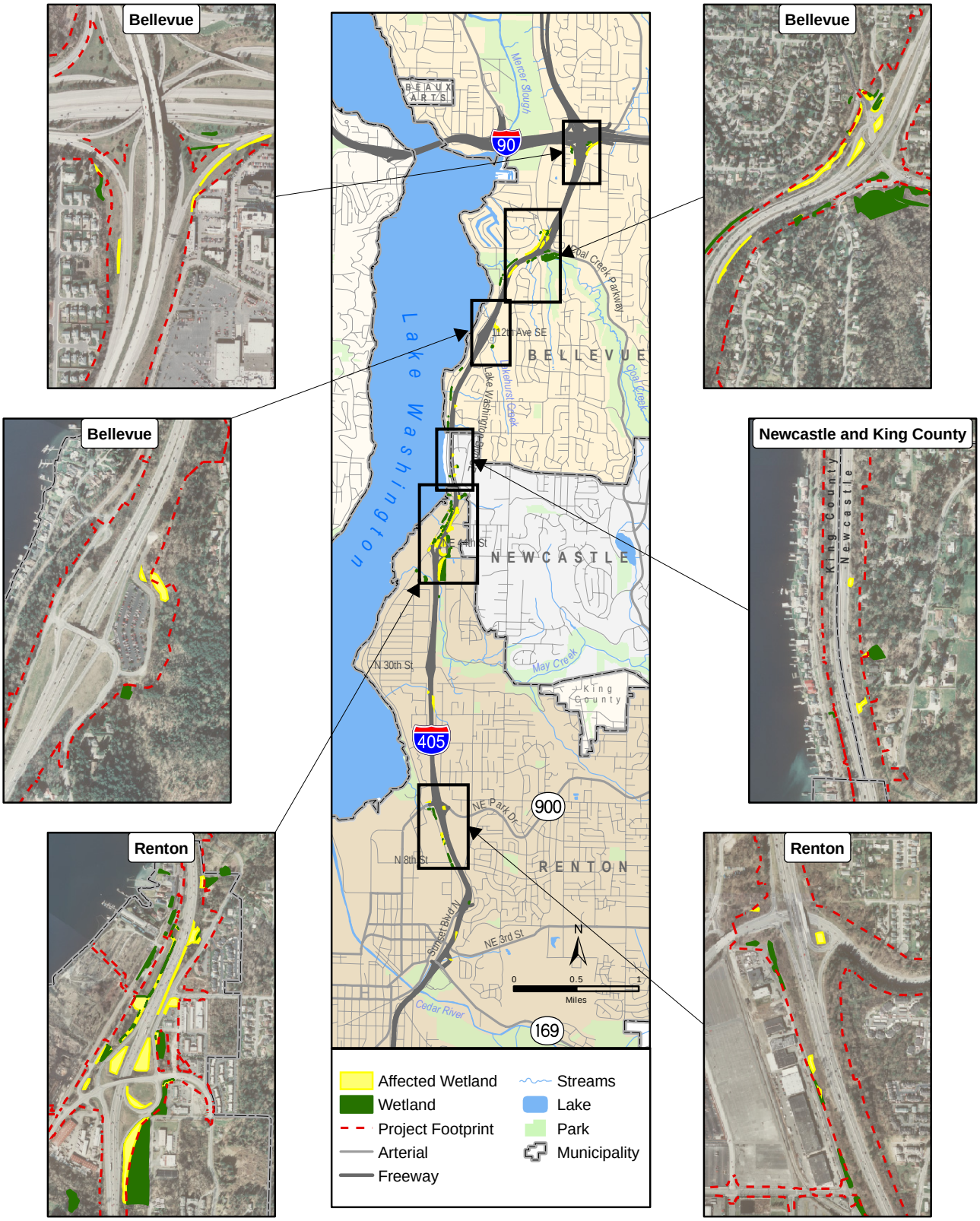
PFO wetlands occur in undisturbed areas, as shown in the example to the left.

PFO wetland, undisturbed

PFO wetlands are often associated with streams, as shown in this example.

PFO wetland associated with stream

Exhibit 5.10-3: Wetlands in the project area



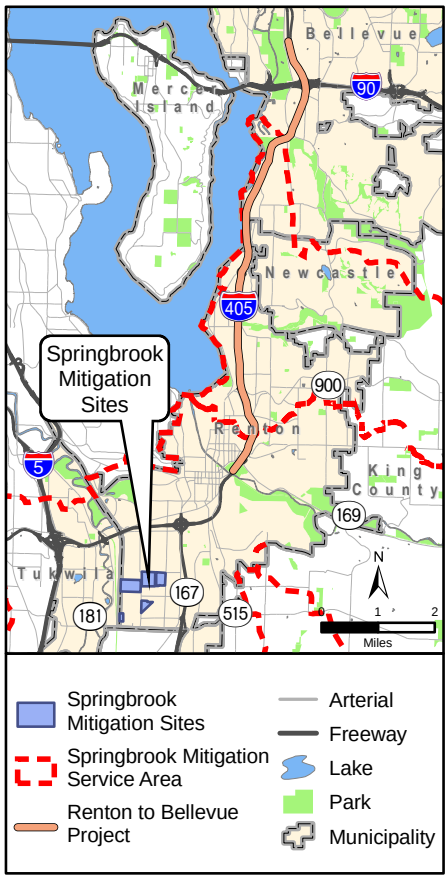
Springbrook Creek Wetland and Habitat Mitigation Bank

All or part of 38 of the 63 wetlands identified in the Renton to Bellevue Project will be permanently lost as a result of the project. A total of approximately 5.5 acres in permanent direct effects will result from WSDOT filling wetlands to construct new facilities or diverting or redirecting surface runoff needed to support wetland hydrology. The approximate acreage of lost wetlands is distributed among local jurisdictions as follows:

- Renton – 3.8 acres
- Newcastle – less than 0.1 acres
- Bellevue – 1.6 acres
- King County – less than 0.01 acres

A list of affected wetlands is provided in Appendix B of the Renton to Bellevue Wetlands Discipline Report.

Exhibit 5.10-4: Springbrook Creek Wetland Habitat Mitigation Bank



How will wetlands be affected once the project is built?

In addition to temporary and permanent effects, operation of the project will result in approximately 0.2 acres of indirect effects to wetlands. Indirect effects occur when most of the existing wetlands will be permanently filled such that the remainder will not likely function at the same level as occurred prior to construction.

Springbrook Creek Wetland and Habitat Mitigation Bank

WSDOT, in partnership with the City of Renton, is developing a mitigation bank called the Springbrook Creek Wetland and Habitat Mitigation Bank (Exhibit 5.10-4). Mitigation banking is one early-action approach identified in the I-405 Corridor Program final EIS and this project is part of WSDOT's watershed approach to wetland mitigation. By consolidating wetlands mitigation into larger sites, WSDOT has the opportunity to work with resource agencies to create aquatic ecosystem functions that are currently lacking in the local watershed. This approach will be used where possible to provide wetland mitigation for unavoidable effects to wetlands from the I-405 Corridor Program, including the Renton to Bellevue Project. Unavoidable effects to wetlands from the Renton to Bellevue Project will be partially compensated with credits from the Springbrook Mitigation Bank.

Cities of Bellevue and Newcastle

To compensate for direct and indirect effects to wetlands and their buffers resulting from the Renton to Bellevue Project located within the Cities of Bellevue and Newcastle, WSDOT will construct and monitor a proposed wetland mitigation site located at one or more locations in the cities of Bellevue and Newcastle. The mitigation approach for compensating for wetland impacts within the cities of Bellevue and Newcastle would be designed to meet the "no net loss" guidance mandated under federal and state executive orders and to meet the mitigation and compensation requirements stipulated in the Implementing Agreement between the Washington State Department of Transportation and the Washington State Department of Ecology Concerning Wetlands Protection & Management dated July 1, 1993. The final sites will be selected and site-specific mitigation proposals would be developed in conjunction with the preparation of permit submittals for the Renton to Bellevue Project.

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

The following activities will be undertaken to avoid or minimize effects to wetlands:

- WSDOT will protect, preserve, and enhance wetlands in the project area during the planning, construction, and operation of transportation facilities and projects consistent with USDOT Order 5660. 1A; Executive Order 11990; and Governor's Executive Orders EO 89-10 and EO 90-94;
- WSDOT will use fencing to clearly mark wetlands in the construction areas that are to be avoided; and
- WSDOT will implement avoidance measures to reduce temporal losses of wetland functions prior to creating wetlands. Project-level design and environmental review has included avoidance, minimization, restoration, and compensation of wetlands.

5.11 Wildlife and Vegetation

Wildlife presence within urban landscapes depends on the availability of suitable habitat. Habitat loss, along with increasing habitat fragmentation, is a primary reason for species decline in urban environments. Greater human access to wildlife habitat can also influence the presence and abundance of wildlife in urban environments. Most of the Renton to Bellevue project area is highly developed for residential, commercial, and industrial activities.

Please refer to the Renton to Bellevue Project Wildlife and Vegetation Discipline Report in Appendix W (on CD) for a complete discussion of the wildlife and vegetation analysis.

How did we identify and evaluate wildlife and vegetation within the Renton to Bellevue project area?

WSDOT reviewed information provided by the Washington Department of Fish and Wildlife (WDFW) and the Washington Department of Natural Resources (WDNR), and conducted field surveys within the project area. WSDOT also contacted resource agencies to validate information and to target field studies.

The study area covered one mile on each side of the freeway (Exhibit 5.11-1) as well as the adjoining, disturbed mixed-forests[1]. Riparian[2] (streamside) areas were mapped along the major drainages within the project area, including May Creek and Coal Creek, to determine habitat characteristics.

A Biological Assessment (BA) has been prepared for the project to comply with the Endangered Species Act. The BA found that the project may affect, likely to adversely affect, endangered species.

DID YOU KNOW?

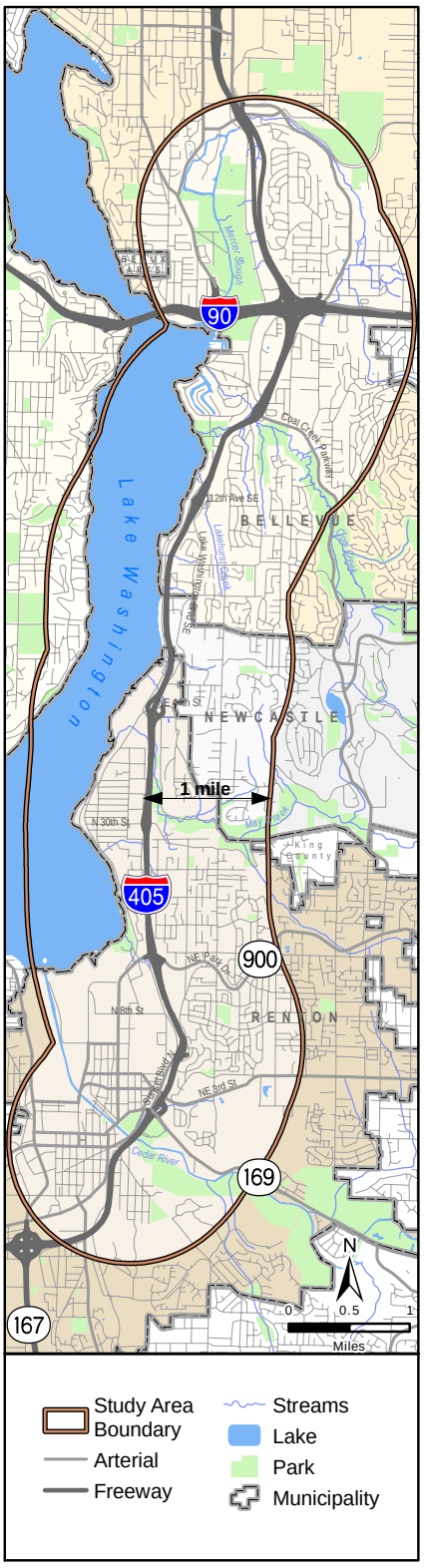
A 1973 federal law, the **Endangered Species Act** (ESA), amended in 1978 and 1982, was enacted to protect plant and animal species from extinction. The National Marine Fisheries Service and the U.S. Fish and Wildlife Service decide whether to list species as threatened or endangered. Federal agencies must avoid jeopardy to and aid in the recovery of listed species. Similar responsibilities apply to non-federal entities.

What types of wildlife and vegetation are found in the project area?

Approximately 70 percent of the project area has been developed as residential areas and commercial and industrial centers. These areas provide little or poor habitat for most animals, except those that have adapted to urban areas.

[1] Forest of hardwood and softwood trees that has been disturbed from development activities.
[2] Land that occurs along or interacts with flowing water.

Exhibit 5.11-1: Wildlife and vegetation study area



Approximately 180 acres of weeds and non-native plants or landscaped land and 300 acres of forested land were identified within the right of way for the project. Two major drainage corridors cross the Renton to Bellevue Project, including May Creek and Coal Creek. The riparian habitats are primarily used by resident wildlife species.

Wildlife Species

The Renton to Bellevue project area is dominated by landscaped areas, patches of native vegetation, and maintained grasses. WSDOT manages vegetation within the right of way to discourage use by wildlife that can enter the roadway and cause accidents. With respect to wildlife habitat, these resources typically have low value and are generally highly disturbed (WSDOT, 2002).

Although habitat within the project area is generally of low value, the mowed right of way in the I-405 Project Corridor is used extensively as foraging habitat for red-tailed hawks. Other wildlife species also use these mowed areas for foraging. Given the extensive level of development that has eliminated large expanses of red-tailed hawk habitat, the grass-dominated portions of the right of way likely provide important habitat for them (WSDOT, 2002).

Special Status Species

Three osprey nests are located within one-quarter mile of I-405. All three nests are situated on artificial platforms, including a cell phone tower. Project biologists observed an active red-tailed hawk nest located on the north side of the Newport Hills Park-and-Ride lot (Witter, 2005). One hawk was observed at the nest and a few hawks were observed in the vicinity of the nest. WSDOT also identified three bald eagle nesting territories in the study area (Southeast Mercer Island, Central Mercer Island, and Chism Beach), but no nests were identified.

Vegetation Species

Both landscaped and unlandscaped areas within the Renton to Bellevue project area are generally dominated by non-native blackberry, sword fern, crab grass, quackgrass, and domestic cherry, among many weed species. The vegetation along the roadway consists of mowed grasses and scattered trees. Approximately 180 acres of weedy and landscaped vegetation are within the right of way of the Renton to Bellevue project area.

A disturbed mixed forest is a forest comprised of both coniferous and deciduous tree species, including native and non-native species, whose structural and species composition has been altered due to past human activities. Western red cedar, western hemlock, Douglas fir, red alder, and big-leaf maple with an understory of sword fern, typically dominate these disturbed areas, with vine maple scattered throughout.

Riparian vegetation within the project area is associated with the major drainage corridors, May Creek and Coal Creek. Coal Creek lacks a riparian corridor within the right of way; the corridor consists of sparse deciduous trees, shrubs, and non-native blackberry (Buchanan 2003). Unlike Coal Creek, May Creek has a more developed riparian corridor where vegetation includes cottonwood, red alder, willow, red-osier dogwood, salmonberry, ferns, and non-native blackberry (Buchanan 2003). Riparian resources for May Creek, Coal Creek, and other drainage corridors in the project area, are more fully addressed in the Wetlands and the Fish and Aquatic Resources discipline reports in Appendices V and X, respectively.

Riparian vegetation along May Creek

How will the project affect wildlife and vegetation?

Wildlife

The permanent loss of approximately 130 acres of vegetation will eliminate habitat in the project area currently used by urban wildlife. Urban wildlife, therefore, will have to move elsewhere in the project area to find available replacement habitat.

Temporary construction effects on resident wildlife can be caused by noise associated with construction activities (such as clearing and grading, and excavation). General construction activities will generate a noticeable increase

Red-tailed hawks use the project right of way for foraging

Bald eagles nesting near the project will not be affected

(roughly 10 decibels over ambient levels) in noise levels within 400 feet of the localized activity during construction. At 0.25 miles from the localized activity, noise levels from construction decrease to below ambient conditions.

Although more adapted to urban environments and associated noise levels, resident wildlife can be affected during localized construction activities when noise levels increase. Resident wildlife may disperse to other locations away from higher noise levels. Upon completion of construction, wildlife will return to these habitats without further effects. Wildlife may also disperse to other locations if their habitat is used as a staging area for construction equipment. However, this effect is temporary as wildlife will return upon removal of the equipment and associated activity and following revegetation. Outside of these localized construction areas and activities, the effects of construction on wildlife will be minimal.

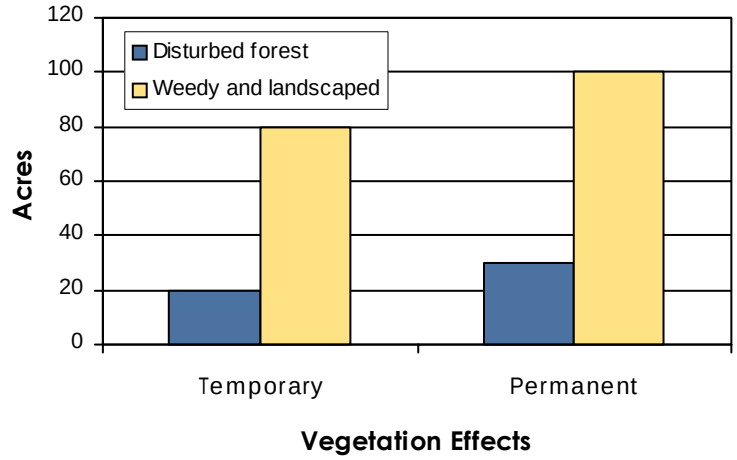
The effects on bald eagles from construction are similar to those on resident wildlife. Nesting bald eagles are far from this zone of elevated noise levels from general construction activities, and they will not be affected. Eagles forage along Lake Washington, particularly the eastern shoreline, between 0.3 and 0.5 miles from the project. This distance is at and beyond where elevated noise levels drop to below ambient conditions; therefore, foraging eagles in this zone will not be affected by elevated noise levels from general construction activities.

Vegetation

Approximately 230 acres of vegetation will be removed with the Build Alternative (Exhibit 5.11-2). Removal of this vegetation will not occur all at once. Vegetation removal will be phased coinciding with construction activities (such as clearing and grading) occurring at specific locations (generally small areas) and times for the duration of the project.

Approximately 130 acres of vegetation will be permanently removed and converted to paved surfaces. The weedy or landscaped vegetation is located along the entire Renton to Bellevue corridor adjacent to and between the existing freeway lanes and surrounding the interchanges.

Exhibit 5.11-2: Temporary and permanent vegetation removal



Approximately 100 acres of vegetation will be removed for construction activities (such as staging areas), but will be replaced with landscaping or other natural materials if cleared. The weedy or landscaped vegetation occurs primarily within medians and existing interchanges.

What measures are proposed to avoid or minimize effects to wildlife and vegetation during construction?

- WSDOT will prepare and implement a revegetation plan. If WSDOT must permanently remove vegetation for roadway construction, it will be replaced with native vegetation within or in the vicinity of the project area.
- WSDOT will adhere to project conditions identified in the Biological Assessment and agency concurrence letters.

What measures are proposed to avoid or minimize effects to wildlife and vegetation during operation?

- WSDOT will revegetate areas in which vegetation removal will occur (except for areas of new impervious surface).
- WSDOT will leave large woody debris found in any landslide material in riparian areas and retain it for future restoration use by WSDOT or donate it to a local watershed group if there is a need for the material.

5.12 Fish and Aquatic Resources

Finfish, shellfish, and aquatic organisms make use of several streams within the project area during some stage of their life cycle (such as spawning, rearing, and migrating). Most project area streams were modified over time and contain limited habitat for fish. A Biological Assessment has been prepared for the project, in compliance with the Endangered Species Act.

Stream culvert in the study area

How did we identify and evaluate fish and aquatic resources for the Renton to Bellevue Project?

Project biologists surveyed the habitat associated with each of the 22 streams identified in the Renton to Bellevue project area (Exhibit 5.12-1). The biologists also evaluated each of the streams for fish habitat value and expected fish presence. During the surveys, they also delineated the ordinary high water mark (OHWM) of each stream. Additionally, the biologists assessed the fish passage capabilities for each culvert that conveys a stream under I-405.

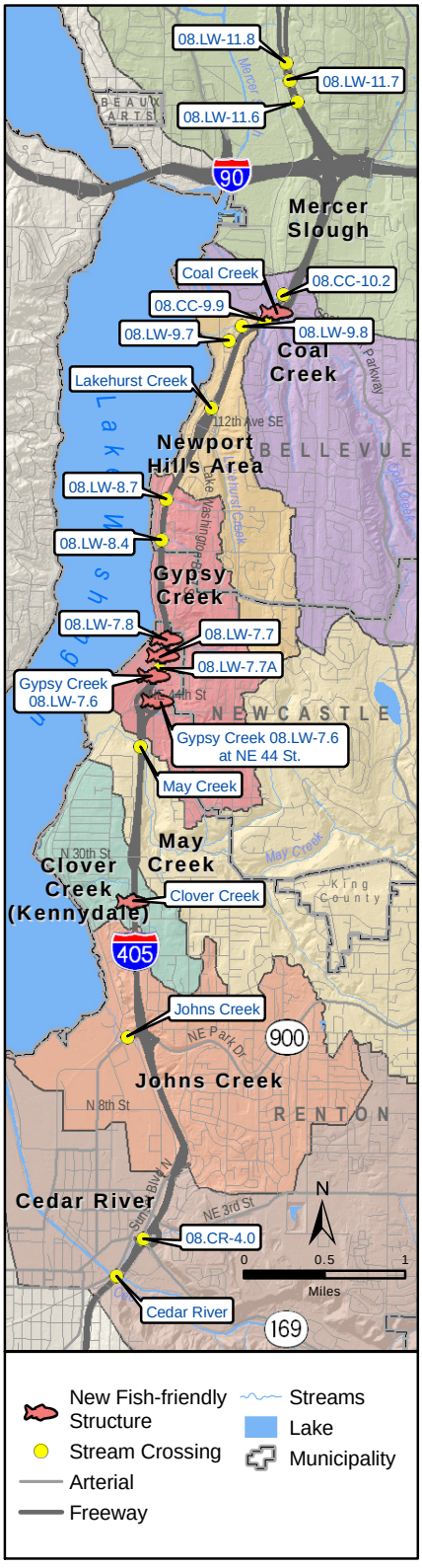
Please refer to the Renton to Bellevue Fish and Aquatic Resources Discipline Report in Appendix X (on CD) for a complete discussion of the fish and aquatic resources analysis.

What streams are in the project area and what kinds of fish live in the streams?

The biologists evaluated habitat for each stream both inside the I-405 right of way as well as an area extending 300 feet upstream and downstream from the right of way boundary. Only six of the streams in the project area are known by traditional names: the Cedar River, Johns Creek, Clover Creek, May Creek, Lakehurst Creek, and Coal Creek. The remaining sixteen streams were named by project biologists according to water resource inventory area (WRIA), the receiving water body, and the approximate milepost where the stream crosses I-405. For example, stream 08.LW-7.6 is located in WRIA 08, flows into Lake Washington, and crosses I-405 at milepost 7.6.

Avoiding or minimizing project effects to aquatic resources is a vital component of the project. Special consideration has been given to these resources because of the biological, environmental, economic, and cultural importance of fish and aquatic species in the Pacific Northwest.

Exhibit 5.12-1: Streams surveyed



The primary species considered in the project area are the federal Endangered Species Act-listed salmonids. The listed species include fall Chinook salmon and bull trout. Other important species within the project area include coho, sockeye, and kokanee salmon; steelhead, rainbow, Dolly Varden, and cutthroat trout (WSDOT, 2002). Information provided by the USFWS indicates that migratory native char, including bull trout and Dolly Varden, occur within the Lake Washington system, but with low frequency (Lantz, USFWS, September 29, 2004). Bull trout adults or sub-adults may be present in Lake Washington (also in Lake Union and Lake Sammamish) year round, depending on the availability of prey resources. Currently, within the Cedar-Sammamish water resource inventory area (WRIA 8), there are no reproducing bull trout populations below the winter snow line (WDFW, 1999). There is no evidence that any of the streams in the vicinity of the Renton to Bellevue project area currently support bull trout.

There are several non-salmonid species present within the project area. They are either resident, migratory, exotic, warm water, or shellfish species. Non-salmonid species that may be present include sculpin, dace, stickleback, lamprey, crayfish, freshwater mussels, chub, northern pikeminnow, suckers, yellow perch, carp, and bullheads.

What type of habitat is required for these fish?

Fish habitat was evaluated upstream and downstream of I-405 even though the presence of migrating salmon is extremely limited because of impassable barriers downstream.

Salmon have specific habitat requirements. Different species have different needs for both juveniles and adults. Many of the I-405 streams provide habitat for juveniles but not for adults. Historically, many of these streams were too small for larger adult salmon spawning activities, especially Chinook. Of the smaller salmon species, coho, sockeye, and kokanee salmon, and cutthroat trout have the potential to occur in thirteen streams within the project area: Cedar River, Johns Creek, Clover Creek, May Creek, 08.LW-7.6, 08.LW-7.6A (Gypsy Creek system), 08.LW-7.7, 08.LW-7.7A, 08.LW-7.8, 08.LW-7.8A, Lakehurst Creek, Coal Creek, 08.LW-9.7, and 08.LW-9.8. These streams all flow into Lake Washington relatively close to the project area, which creates

eco-connectivity between the lakeshore habitat and the streams. Smaller fish often take advantage of different habitats, depending on the season or a specific life stage.

Bull trout require very cold water and high quality stream habitat. For a typical stream, this includes many deep pools with plenty of large woody debris in the stream and year-round cold water.

Biologists evaluated habitat conditions to determine which resident fish could be present. Resident fish and most of the non-salmonids are different from the migratory salmon species because they live in streams or lakes all their life—that is, they do not migrate to the ocean. Resident fish, which are often a food source for some salmonids and each other, may include native species as well as introduced species. Like salmon, resident species have unique habitat requirements for food, temperature, shade, or the presence of small gravels.

What is eco-connectivity?

Eco-connectivity is environmental continuity accomplished by maintaining links between natural habitats or by defragmenting isolated habitats.

What is the condition of the fish habitat?

Use by salmon and resident species is limited in many of the streams because of natural and development-caused conditions, including, but not limited to, poor water quality, lack of spawning substrate, limited open channels, steep gradients, non-passable culverts, and periods of high runoff.

Many of the streams also exhibit poor habitat and a low potential for salmon or resident species. This is attributed to conditions such as limited food sources, no cover, no water during part of the year, or a lack of open channels (because of pipes and culverts and water routed through stormwater control basins). Many of the unnamed urban drainages retain less than one-half of their historic open-water channels because portions of them have been piped underground. For others, during the dry summer months the flow disappears underground because of development upstream.

For bull trout, streams in the project area are too warm, they do not have enough woody debris for cover, and they do not contain the type of gravels needed for bull trout to lay eggs. Historically, because of natural limiting factors, bull trout use of the small streams in the project area probably ranged from extremely limited to no presence at all.

Cutthroat trout are more tolerant of urban stream conditions and appear in some of the streams that flow beneath I-405

within the project area. Cutthroat trout can survive as a year-round stream resident, or they can migrate to and live in Lake Washington or Puget Sound. Most of the cutthroat in the project streams are considered to be year-round residents. Habitat in the project streams is adequate for cutthroat trout to spawn, hatch, and rear to adulthood.

How will the project affect fish, aquatic habitat, and threatened and endangered fish species?

WSDOT considers the Renton to Bellevue Project an opportunity to demonstrate how a highway can be constructed in an urban environment that either avoids or minimizes effects to natural resources, such as fish and streams. The Renton to Bellevue Project is in an urban area where people, buildings, and roads have existed for many decades, often in conflict with fish and streams.

WSDOT's goal is to minimize the harmful effects and maximize the long-term, beneficial effects by maintaining existing aquatic resources, and then improve those resources over time. Project engineers have used the results of the stream evaluations as a basis for making changes in the project design to avoid, minimize, or provide on-site and like-kind mitigation for potential effects. As a result of collaboration between the project biologists and design engineers, the Renton to Bellevue Project will have no major adverse effects on fish or aquatic resources and only minor, short- and long-term effects. In fact, the project will have beneficial effects on the Cedar River, Clover Creek, Stream 08.LW-7.7A, Stream 08.LW-7.8, May Creek, Coal Creek, and Gypsy Creek, including restoring fish passage, improving instream habitat, improving water quality and habitat by treating stormwater runoff, and removing existing instream obstructions such as pipes and screens.

WSDOT will build bridges on I-405 to replace a 350-foot-long, undersized culvert that conveys Coal Creek under I-405. Beneath the new bridge, Coal Creek will have sufficient space to meander freely, thereby restoring open channel habitat that will improve passage for steelhead, Chinook, and coho salmon, lamprey, cutthroat and other resident fish for full utilization of the watershed habitat.

WSDOT will also improve the stream habitat underneath the May Creek bridges. The removal of piers near the edge of

May Creek under the May Creek Bridge will allow the stream to meander more naturally compared to the confined channel that exists now. Fish will benefit when they seek the improved off-channel refuge during periods of high water.

WSDOT will replace four impassable cross-culverts with new, larger fish passage culverts in the Gypsy Creek, 08.LW-7.7, and 08.LW-7.8 stream systems. Large sections of inaccessible stream habitat will be opened up for use by several fish species, including coho salmon. The larger culverts will also provide greater stream eco-connectivity, a wider stream channel, healthier riparian habitats, and instream habitat restoration. When the direct habitat improvements occur in combination with the removal of stormwater discharge from the streams, the overall improvements to these streams result in over 5,600 feet of improved access and habitat values for fish to use.

Clover Creek is another stream where WSDOT will construct a new, larger fish passage culvert. Current effects of development throughout the Clover Creek stream corridor include the freeway, railroad, housing, a water supply diversion for a fish farm, major arterials, and stormwater projects. The stream has been degraded so much over the years that fish habitat values almost preclude fish life. WSDOT will create fish passage and instream habitat improvements that result in new access for salmonids to over 2,900 feet of stream upstream of I-405. The instream restoration phase includes 450 feet of new open-channel habitat that now flows through residential neighborhoods by means of a channel lined with creosote ties or is maintained in pipes and catch basins. Removing project stormwater discharge from Clover Creek will also enhance instream habitat values for all aquatic life upstream (indirectly) and downstream (directly) from the project area. The direct water quality benefit will enhance 2,800 feet of stream habitat downstream of the improvements.

Where will fish-friendly culverts and structures be placed?

WSDOT will make fish passage improvements at the following locations:

- Clover Creek crossing – a new fish-friendly culvert and new stream channel;
- Gypsy Creek crossing – two new fish–friendly culverts;
- Steam 08.LW-7.7A crossing – new fish-friendly culvert;
- Stream 08LW-7.8 crossing – new fish-friendly culvert;
- Coal Creek crossing – replace a culvert with a bridge.

Chinook salmon require very cold water to survive; therefore, WSDOT will manage vegetation adjacent to streams (vegetation is one of nature's ways of conserving water), within the right of way to benefit aquatic species by ensuring that:

- Vegetation will remain in place near the roadway streams and waterways;

- Vegetation will be planted along streams to provide cover and to keep the water cool with additional shade; and
- Vegetation will be kept healthy and functioning over time.

Most of the other aquatic resources, including small insects, will also benefit from the colder water and extra vegetation.

In addition to shade, vegetation provides other long-term benefits. For example:

- Plants reduce erosion, thereby introducing less sand and dirt to the streams;
- Dead vegetation helps create big pools in the streams that attract fish;
- Plants retain and release water as part of a natural cycle that keeps water in streams during the hot summer;
- Tiny insects live on the wood and leaves of plants and provide food; and
- The stream banks and shoreline remain natural.

Will the project remove barriers to fish passage?

The project includes several beneficial actions that will restore and improve fish passage.

WSDOT will construct fish-friendly culverts or bridges to replace existing fish passage barriers on several streams (Gypsy Creek [2 culverts], 08.LW-7.7, 08.LW-7.8, and respective tributaries, Clover Creek, and Coal Creek). After WSDOT constructs the structures, juvenile and adult salmonids will be able to swim upstream and downstream beneath the freeway. Initially, and especially in the smaller streams, cutthroat trout and other resident species will benefit the most. The fish passage projects will have greater benefits in the future for migratory fish, as other barriers throughout the watershed are removed. Currently, these species either use lower portions of the watersheds, including the Lake Washington nearshore habitat, or have access to the lower stream sections.

Improvements to the stormwater treatment structures have indirect benefits to fish passage. The new stormwater

structures will help maintain normal stream flows, thereby making it easier for young fish to swim upstream during a storm event. This means fish will have better access to habitats.

Additionally, revegetation will help retain more water in the streams for longer periods of time. During the critical dry summer months, fish will benefit from improved access to habitats and have a higher likelihood of survival.

How will construction activities affect fish and aquatic resources?

Construction activities that can affect fish and stream habitat in the short term include:

- Filling and grading;
- Removing stream-side vegetation; and
- Temporarily diverting streams and dewatering.

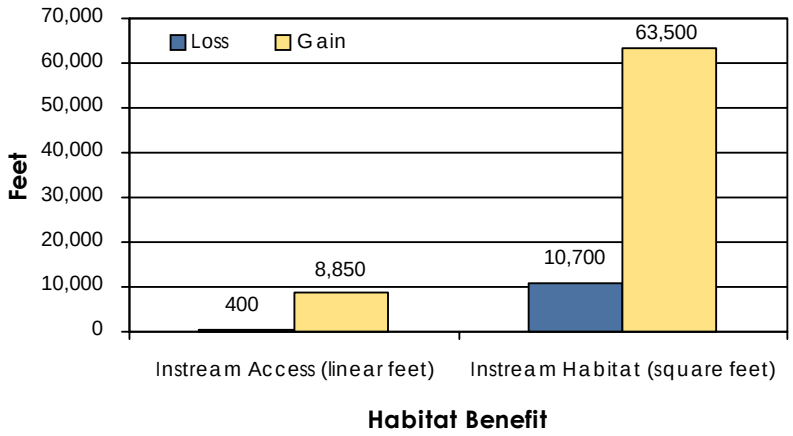
Road widening, culvert replacement and extension, as well as construction of headwalls, retaining walls, and stormwater conveyance systems and associated outfalls to streams, will involve some work in streams, resulting in some loss of instream habitat (such as pool and riffle areas). These disturbances may affect spawning, rearing, and migration habitat; however, these effects will be short term because of beneficial revegetation or restoration of other stream functions. WSDOT will not allow any in-water construction work to take place except during seasonal work windows established to protect fish, unless prior approval has been obtained from fisheries resource agencies.

In-water work can also result in short-term increases in turbidity and sedimentation, similar to the effects of removing stream-side vegetation. Culvert replacement, culvert extension, or headwalls may require temporary disturbance to the stream bank. There is the potential for bank erosion and downstream sediment transport during the initial plant re-growth period of any stream bank segment subjected to disturbances associated with culvert replacement.

During construction of the Renton to Bellevue Project, the stream crossing culverts for several streams will be replaced. They include Gypsy Creek, 08.LW-7.7, 08.LW-7.8, and respective tributaries, Clover Creek, and Coal Creek. On average, approximately 40 to 50 linear feet of stream on each

side of I-405 may be affected long term (that is, filled and graded). An approximate loss of 10,700 square feet of aquatic habitat will result from project construction. However, after fish-friendly culverts are constructed, approximately 8,850 linear feet and 63,500 square feet of stream habitat will become available for fish use upstream of the freeway (Exhibit 5.12-2).

Exhibit 5.12-2: Fish habitat gains and losses



To reduce the amount of necessary in-water work, the new Coal Creek bridge will be constructed over a new dry channel to minimize effects. Flow will then be rerouted to the new channel. For a short distance, the stream water will become turbid until it mixes with the ambient water. The disturbance will be temporary; since the work will be planned during the summer low-flow period when salmonids are typically not present; the effects will be minimal. The new bridge at Coal Creek will improve fish use for the entire Coal Creek and Newport Creek subbasins where there are over 4 miles of open-channel habitat upstream of the project area.

Streamside (riparian) vegetation plays a number of important roles in supporting instream habitat functions. It provides large woody debris, food, stream bank stabilization, water storage, and water quality (Poole and Berman, 2001). Therefore, removal of streamside vegetation is likely to affect these habitat functions. The extent of vegetation removal determines the type and degree of the effect, especially regarding large woody debris recruitment.

Streamside vegetation removal can alter soil stability. Loose soils can cause erosion, which, in turn, can increase sediment deposition in streams or fill the pool habitat (Berman, 1998).

In addition, reduction in canopy cover can promote higher temperatures and increase sediment transport from cleared areas (Bolton and Shellberg, 2001).

Vegetation clearing can adversely affect salmonid habitat. Depending on the duration, timing, frequency, and level of turbidity, the associated sedimentation can cause behavioral, sublethal, and lethal effects in juvenile and adult salmonids (Newcombe and Jensen, 1996). However, vegetation loss will be offset by over 22,900 square feet of instream habitat gained for fish use after construction of the new fish-friendly culverts. This number does not include the gain in habitat use for fish in the upper Coal Creek Basin.

Effects to streamside, vegetated areas will result in permanent removal of an estimated 94,100 square feet (approximately 2 acres) of streamside habitat.

During in-water construction work at Gypsy Creek, 08.LW-7.7, 08.LW-7.8, their respective tributaries, Clover Creek, May Creek, and Coal Creek, the work area isolation activities, dewatering, or temporary stream diversion could harm fish. Harmful activities can include fish seining, electrofishing, fish exposure to turbidity (although rare), and small losses of streamside functions because of vegetation removal. These fish stressors may induce responses ranging from behavioral to lethal. WSDOT will use National Marine Fisheries Service handling procedures to minimize harmful effects to fish species.

In addition, macro invertebrates and amphibians occupying the dewatered segments of the stream channel will be displaced, thereby temporarily disrupting food sources for fish. However, numerous studies have indicated that benthic invertebrates drift down from upstream, rapidly recolonizing the affected area (Barton, 1977; Reed, 1977; Chisolm and Downs, 1978; Waters, 1995). Likewise, aquatic insect production is seldom affected in the long term by minimal habitat displacement and short-term pulses of suspended sediment (Spence et al., 1996). Therefore, any effects on benthic macro invertebrates and aquatic insects are expected to be short-term.

WSDOT will affect various types of stream habitat and functions during construction of the new fish-friendly cross-culverts and bridges. The quantity and quality of instream habitat (habitat below the OHWM) is critical for fish. The riparian areas protect that instream value by buffering fish life from development. When WSDOT widens I-405 and replaces open-channel habitat with a fish-friendly culvert, there will be a loss of natural instream and riparian habitat by putting the stream flow into a culvert. The amount of habitat lost for fish and other aquatic resources will be small compared to the total amount of habitat gained for fish use after access is restored.

The greatest benefit for fish will be restoration of year-round access to their spawning, feeding, and rearing habitat. Habitat is the key to their survival, therefore, the quantity and quality of the habitat will determine if the fish will survive on their own or need further protection. The loss of the riparian areas during construction will be offset by a large gain in two different, but more important stream habitat functions: fish passage (five new culverts, one new bridge) and access to instream habitat (a net increase of 8,450 linear feet of stream equaling 52,800 square feet of habitat below the OHWM).

How will operation activities affect fish and aquatic resources?

Operational effects are direct effects caused by the existence, use, and maintenance of the project elements, including new or altered stream crossing culverts, over-water structures, stormwater facilities, and impervious surfaces. The primary difference between existing operational effects and operational effects of the project will be positive. All of the new impervious surfaces and stormwater facilities will be designed to reduce adverse effects to streams and, in several areas, improve conditions compared to those that exist today.

Although project elements are designed and sited to avoid or minimize adverse effects on aquatic life, some residual effects are likely during operation of the project.

The Renton to Bellevue Project will extend culverts and construct headwalls to accommodate a wider roadway span in the vicinity of Clover Creek, Gypsy Creek, 08.LW-7.7, 08.LW-7.8, and respective tributaries.

Most of the existing highway runoff drains to streams, watercourses, and storm drains with minimal treatment for

quantity or quality. The Renton to Bellevue Project will have beneficial effects on fish life in streams and in the Cedar River, Coal Creek, and Lake Washington by improving existing water quality conditions through the treatment and removal of sediments, and other roadway pollutants. Proper maintenance and improvements to these stormwater facilities over time will continue to provide benefits to the aquatic environment.

A design criterion for the Renton to Bellevue Project is to limit or reduce peak flows resulting from stormwater facilities discharging to the streams in the area. As a result, the increase in impervious surfaces and the proper operation of stormwater detention facilities will not adversely affect peak and base streamflow in the Renton to Bellevue project area streams.

Detailed stream-by-stream discussions of the effects of the specific project elements on fish species and aquatic habitat are presented in the Renton to Bellevue Project Fish and Aquatic Resources Discipline Report (Appendix X on CD).

What measures are proposed to avoid or minimize effects to fish and aquatic species during construction?

WSDOT will use the following measures to avoid or minimize effects to fish and aquatic resources during construction:

- WSDOT will implement construction BMPs (such as silt fencing or sedimentation ponds) to avoid disturbing sensitive natural areas.
- WSDOT will not allow any in-water work to occur except during seasonal work windows established to protect fish unless otherwise approved by the appropriate agencies.

What measures are proposed to avoid or minimize effects to fish and aquatic species during operation?

WSDOT will use the following measures to avoid or minimize effects to fish and aquatic resources during operation of the project:

- WSDOT will remove stormwater from some streams and discharge it through facilities that are located, designed, and approved to minimize long-term aquatic

effects by mixing with large volumes of water in Lake Washington.

- WSDOT will construct fish-friendly culverts near the NE 44th Street Interchange and at Clover Creek that will restore fish passage beneath the freeway. Approximately 8,850 linear feet of stream between the freeway and the upper watersheds will become available for migratory fish use.
- WSDOT will construct new bridges at Coal Creek to improve passage and enhance fish utilization for the entire upper Coal Creek and Newport Creek Basins. There is over 4 miles of habitat in upper Coal Creek and another 4,500 feet in the Newport Creek Basin.
- WSDOT will construct headwalls[1] at the five new fish-friendly cross-culvert inlets and outlets to minimize the amount of grading and filling and to restore and increase long-term riparian functions at each site.
- WSDOT's ongoing maintenance of stormwater treatment and detention facilities will not include the application of any chemical weed control agents (herbicides).

[1] A concrete structure at the end of a culvert to protect the embankment slopes, anchor the culvert, and prevent undercutting.

5.13 Geology and Soils

Geology is the study of the origin, history, materials, and structure of the earth, along with the forces and processes operating to produce changes within and on the earth. When we consider the geologic features of a project area, we must consider how improvements will interact with the soils, groundwater, and topography, as well as the area's unique physical features. Through focused study, we can make determinations about erosion, suitability of soils for construction, slope stability, and other factors.

Landslide area within the project vicinity

How did we evaluate geology and soils for the Renton to Bellevue Project?

WSDOT scientists and planners studied the geology, soils, topography, physical features, and potential for erosion in the study area. Our data sources included geological maps, aerial photos, and geotechnical reports.

Please refer to the Renton to Bellevue Project Geology, Soils, and Groundwater Discipline Report in Appendix Y (on CD) for a complete discussion of the geology and soils analysis.

What is the geology of the project area?

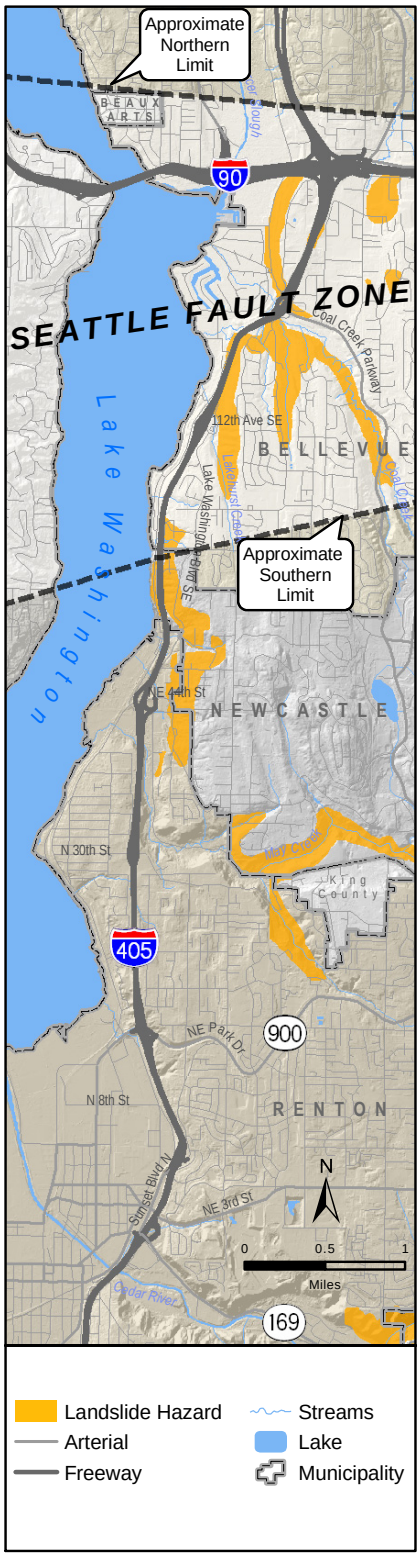
Most of the I-405 Renton to Bellevue project area is located along the west-facing slopes of the topographic trough occupied by Lake Washington. The alignment also crosses or runs adjacent to several drainages, most notably the Cedar River, May Creek, and Coal Creek. These drainages are typically occupied by relatively loose or soft soils. Several ancient landslides and areas of landslide-prone soils are located along the project alignment, especially between May Creek and Coal Creek.

Landslide Conditions

Geologists identified a number of landslide conditions along I-405 in the project area. In the Kennydale area, we identified several small, relatively shallow landslides, along with one larger, and presumably deeper, one along the north side of NE Park Drive. Shallower debris slide and debris flow-type failures are possible where cuts are planned that intersect swales along west-facing slopes. It is relatively easy to control this type of landslide.

What is a landslide?
A landslide is the sudden release of a mass of rock and earth down a slope.

Exhibit 5.13-1: Landslide areas



What soils are found in the project area?

Generally, the project area is underlain by dense glacial soils. Notable exceptions include the alluvium (deposits from the streams and rivers) in the stream drainages that cross the project alignment, localized areas of artificial fill, lake and peat deposits, and recessional outwash (deposits of sand and gravel from glacial meltwater).

Many of the upland slopes in the study area are sites of prehistoric landslide activity (see Exhibit 5.13-1). The landslides likely occurred during and after the retreat of glacial ice at the end of the last glaciation. Many of the ancient landslide deposits have been relatively stable; however, they can become reactivated when disturbed by development.

Geologists also identified numerous shallow landslides and three large deep-seated landslide complexes in the Coal Creek area. The largest of these landslide complexes is located north of May Creek and appears to extend to Lake Washington on its northern end. No landslide slopes were identified near SR 169.

Liquefaction Hazard Areas

Liquefaction occurs during a strong earthquake when ground movements cause loose, saturated granular soils to lose their strength and essentially become a heavy liquid. Liquefaction can result in ground settlement, lateral spreading or movement of ground, and foundation failure. In the Renton portion of the project area west of I-405, the potential for liquefaction is high. Likewise, the potential for liquefaction in the May Creek area is high and moderate in the Coal Creek area. Geologists do not consider liquefaction of soils to be an issue in the Kennydale area.

Soft Ground Areas

Areas underlain by soft, compressible organic and clay soils can present settlement and subgrade stability problems for road construction. Embankments placed on these types of conditions can cause substantial settlement or induce an embankment foundation failure. In addition, structures or walls located in areas underlain by soft ground conditions are likely to experience much stronger shaking in an earthquake than adjacent areas. With the exception of the area to the west of I-405, soft soils are generally not likely to be encountered in the Renton portion of the project area. Geologists have

identified soft ground areas in the vicinity of both Coal Creek and May Creek where measures will need to be taken to account for potential settlement and stability. Geologists do not consider soft ground areas to be an issue in the Kennydale area.

How will the project affect geologic features?

Soils and erosion

Construction will involve substantial earthwork, including major cuts (excavations) and fills. Cut materials will be reused in areas of the project that require fill. However, there will likely be areas where the excavated soils are unsuitable for reuse, particularly during wet weather. Unsuitable soils will be exported offsite for disposal. Similarly, we expect to import some fill soils for use along the alignment. New fill materials (over 50 cubic yards) used in the Renton Aquifer Protection Area must be certified by WSDOT as contaminant free.

Seismicity is a factor within the study area because the Seattle Fault Zone crosses the project alignment (see Exhibit 5.13-1). If a fault exhibits surface displacement during future project operation, considerable damage to the roadway, utilities, and structures can result. The current WSDOT bridge design philosophy for seismic events is to preserve life-safety through the prevention of collapse. Major changes in bridge geometry and even non-serviceability following the design level seismic event are potential results; however, the bridge must not collapse.

Erosion will be a concern during construction. Implementing a temporary erosion and sedimentation control (TESC) plan, as described later, will substantially reduce the volume of erosion and the potential for discharge of silt-laden runoff to nearby bodies of water.

What measures are proposed to avoid or minimize effects to geology and soils during construction?

Seismicity

- WSDOT will meet American Association of State Highway and Transportation Officials (AASHTO) design standards with a design seismic event equivalent to a 10-percent chance of exceedance in 50 years (425-year return period).

- WSDOT will implement design methods to make project elements stable under the design AASHTO event and limit susceptibility to collapse under an unlikely larger event.

Liquefaction-prone Areas

- WSDOT will identify areas where liquefaction prone soils may be located.
- WSDOT will evaluate the potential effects to structures from liquefaction, if structures underlain by liquefaction-prone soils are identified.
- WSDOT will use appropriate measures to reduce long-term liquefaction and lateral spreading risks if it is determined that liquefaction risks are unacceptable.
- WSDOT will develop the means and methods to avoid or minimize settlement resulting from construction vibrations associated with measures to reduce liquefaction risks, if liquefaction prone soils are identified.

Soft Ground Areas

- WSDOT will take appropriate measures to assess and reduce potential settlement problems associated with existing utilities or structures in areas underlain by soft, compressible soil.
- WSDOT will design the structures and embankments to accommodate or avoid the settlement if the potential settlement is unacceptable.
- WSDOT will develop the means and methods to avoid or minimize settlement resulting from construction vibrations in areas underlain by soft or loose soils.

Slope Stability and Landslide Areas

- WSDOT will develop appropriate construction procedures to maintain or enhance slope stability in areas underlain by landslides or with landslide-prone geology. The design through these areas will include suitable wall types such as soldier piles with tiebacks, possibly supplemented with enhanced drainage such as improved surface drainage or horizontal drains.

- WSDOT will design earthwork and wall placement sequencing plans, construction drainage plans, and a slope monitoring program.
- WSDOT will drain suspected or observed seepage to reduce the risk of landslide and surface sloughing through the use of gravel drainage blankets, french drains, horizontal drains, placement of a surface rock facing or other methods.

Dewatering

- WSDOT will use properly designed, installed, and operated dewatering systems.
- WSDOT will control dewatering discharge to avoid adverse effects.

Erosion

- WSDOT will prepare and implement a TESC plan.
- WSDOT will take additional action to minimize erosion, maintain water quality, and achieve the intended environmental performance, should any BMP or other operation not function as intended.

Earthworks

- WSDOT will place and maintain stockpiles properly to avoid erosion or slope stability problems.

Permanent Drainage Systems for Cut Slopes

- WSDOT will locate areas where permanent drainage will be required by site conditions for cut slopes.

What measures are proposed to avoid or minimize effects to geology and soils during operation?

Seismicity

- WSDOT will implement its procedures for inspecting critical highway elements following a major seismic event.

Soft Ground

- WSDOT will conduct long-term monitoring of embankments or walls constructed on soft ground to ensure that they are not experiencing unacceptable settlement.

Slope Stability and Landslides

- WSDOT will conduct long-term maintenance of surface and subsurface drainage in areas of landslide risk. If installed, horizontal drains will be periodically inspected and maintained, as these drains tend to clog with time. If identified as a need during the design geotechnical investigation, long-term monitoring of slopes and walls may be appropriate in selected areas.

5.14 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, and total petroleum hydrocarbons[1], also known as TPH. Without proper handling, removal, and containment, these materials can pose dangers to human health and the environment. Identifying known and potential contamination prior to construction is important because it can greatly reduce the possibility of exposure to people and the environment.

Hazardous materials can be encountered on project sites.

How did we identify hazardous material sites within the Renton to Bellevue project area?

The project team reviewed historical land uses, regulatory agency database lists (Environmental Data Resources, Inc. [EDR], 2004), and Washington State Department of Ecology (Ecology) site files. The project team also conducted a windshield survey of properties within the project area.

Please refer to the Renton to Bellevue Project Hazardous Materials Discipline Report in Appendix Z (on CD) for a complete discussion of the hazardous material analysis.

What contaminated sites are located in the project area?

Contaminated materials may be encountered on, or down-gradient from, several properties located along the proposed right of way for the Renton to Bellevue Project. We examined twenty potentially contaminated sites in more detail (Exhibit 5.14-1), including several "substantially contaminated"[2] properties, described in the following paragraphs.

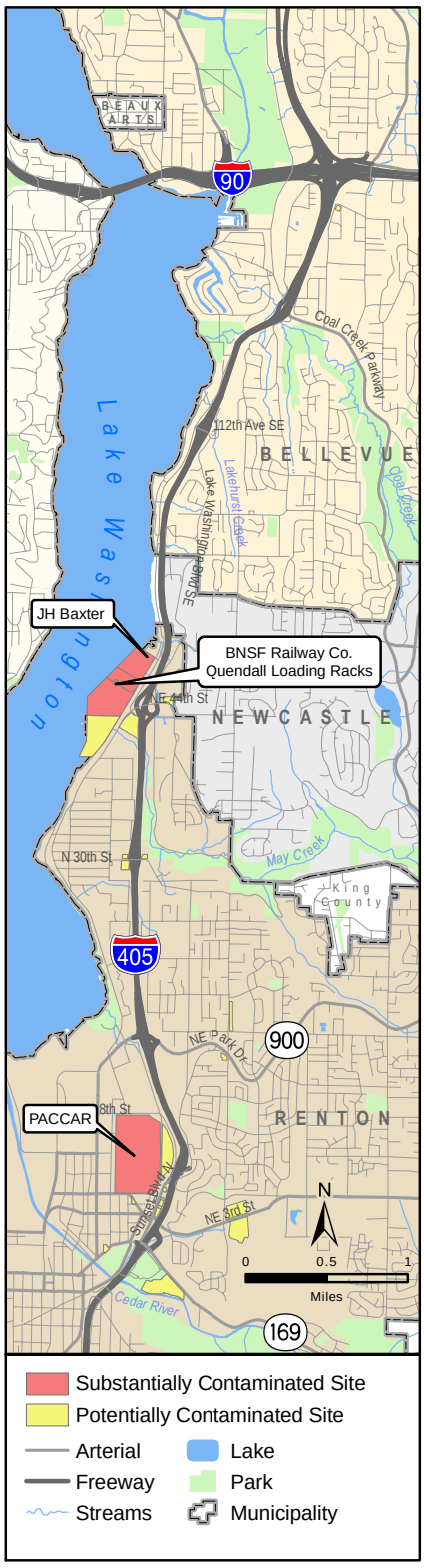
What are "reasonably predictable" properties?

"Reasonably predictable" properties refer to sites with recognized environmental conditions based on existing data, or they can be predicted to have those conditions based on site observations, previous experience, or by using best professional judgment. Common examples of reasonably predictable sites might include a dry cleaning business or a former gas station. These properties are typically small; contaminants are localized and are relatively non-toxic; and abatement or remediation activities are routine.

[1] Total petroleum hydrocarbons (TPH) is a term used to describe a large family of several hundred chemical compounds that originally come from crude oil.

[2] Substantially contaminated sites are sites that have potential for substantial contamination of soil, groundwater, surface water, and/or sediment; contain contaminants that are persistent or expensive to manage; and lack information on predicted remedial costs.

Exhibit 5.14-1: Potentially contaminated sites



JH Baxter & Co. Inc. – This site is a former wood treatment plant with confirmed groundwater, sediment, and soil contamination (phenolic compounds, petroleum products, polycyclic aromatic hydrocarbons [PAHs], and non-halogenated substances). Cleanup is ongoing. This site, located adjacent to the proposed project right of way near the NE 44th Street interchange, was reviewed in greater detail because of the presence of confirmed soil and groundwater contamination in relation to right of way.

BNSF Railway Quendall Loading Racks – This property is a former tar refinery, fuel storage, and a log sort yard. The site is currently awaiting completion of a Risk Assessment and Feasibility Study (Agreed Order, 1993). This site, located within the project right of way near the NE 44th Street interchange, was further reviewed based on the suspected presence of soil contamination in relation to right of way.

Pacific Car and Foundry (PACCAR) – This Superfund site in Renton is currently undergoing long-term groundwater monitoring. All cleanup activities were completed at the site in 1996 under a Consent Decree (Ecology, 1988) between Washington State and PACCAR. Soil contaminated with low levels of PAHs, polycyclic chlorinated biphenyls (PCBs), petroleum hydrocarbons, and metals remains onsite. The area is capped by at least 12 inches of structural fill material and, in most areas, pavement. This site is located within the planned right of way at N 8th Street.

The remaining seventeen sites are considered to be "reasonably predictable" properties with respect to presenting a potential for the presence of hazardous materials.

Will the project affect any hazardous materials sites?

Despite measures to manage risks associated with hazardous materials, unknown contaminants can be encountered. These materials can result in short-term contamination to the environment before avoidance actions can be taken.

Construction associated with the Renton to Bellevue Project can encounter non-identified substances, underground storage tanks (USTs), or contaminated media (including asbestos-containing materials [ACM] and lead-based paint [LBP]).

The Renton to Bellevue Project will improve congestion, traffic flow, and safety compared to the No Build Alternative. This

improvement in traffic operations will reduce the risk of accidents, including those involving hazardous substances, and decrease the risk of harmful substances entering soil and water resources within the project area.

What measures are proposed to avoid or minimize effects from hazardous materials during construction?

Known or Suspected Contamination within the Project Right of Way

- WSDOT will conduct preliminary site investigations before acquiring right of way property and before beginning construction activities where sites of concern have been identified.
- If ongoing remedial activity is affected by this project, WSDOT will coordinate with the respective stakeholders.
- WSDOT will prepare a spill prevention control and countermeasure (SPCC) plan that provides specific guidance for managing contaminated media that may be encountered within the right of way.
- WSDOT may be responsible for the remediation and monitoring of contaminated properties that will be acquired for this project. In such cases, WSDOT will further evaluate the identified properties to assess their condition before acquisition or construction occurs.
- Prior to construction, WSDOT will have a thorough asbestos containing materials/lead-based paint (ACM/LBP) building survey completed by a certified building inspector on all property structures that will be acquired and/or demolished.
- If WSDOT acquires a portion or all of a property (building, structure) suspected of containing ACM/LBP, WSDOT will properly abate and dispose of any existing ACM and LBP contamination prior to construction activities. Depending on the concentration of lead in the demolition debris, some debris may need to be disposed of as dangerous waste, which will require Ecology to be notified.
- If WSDOT encounters an underground storage tank (UST) within the right of way, WSDOT will assume

cleanup liability for the appropriate decommissioning and removal of the UST.

- WSDOT will dispose of all construction waste material, such as concrete and other potentially harmful materials at approved sites.
- WSDOT may acquire the responsibility for cleanup of any soil or groundwater contamination encountered during construction within WSDOT right of way. Contamination will be evaluated relative to Model Toxics Control Act (MTCA) cleanup levels.
- WSDOT will meet all regulatory conditions imposed at contaminated properties (such as consent decree) associated with construction. These conditions can include ensuring that the site is properly contained after construction is completed so that contaminants do not migrate offsite and so that the health and safety of all on-site personnel are protected during work at the site.
- WSDOT will consider entering into a pre-purchaser's agreement for the purposes of indemnifying WSDOT against acquiring the responsibility for any long-term cleanup and monitoring costs.

Known or Suspected Contamination Outside of the Project Right of Way

- Contaminated groundwater originating from properties located up-gradient of the right of way could migrate to the project area. WSDOT generally will not incur liability for groundwater contamination that has migrated into the project footprint as long as the agency does not acquire the source of the contamination. However, WSDOT will manage the contaminated media in accordance with all applicable rules and regulations.

Unknown Contamination

- If WSDOT acquires a property that has unknown contamination, the agency could incur liability for any contamination discovered after acquisition, as well as liability for the removal of any stored materials remaining onsite at the time of the acquisition. WSDOT could be responsible for cleanup or disposal

of these unknown substances, for example, USTs and contaminated media (including ACM and LBP). If unknown contamination is discovered during construction, WSDOT will follow the SPCC plan as well as all appropriate regulations.

CHAPTER 6

Cumulative Effects Analysis

This analysis expands on the cumulative effects analysis (CEA) presented in the I-405 Corridor Program Final EIS to address cumulative effects of the Renton to Bellevue Project. Cumulative effects are important to consider during the construction and operation of a project.

The Renton to Bellevue Project will benefit water quality

What are cumulative effects and why do we study them?

The Council on Environmental Quality's[1] regulations implementing the procedural provisions of the National Environmental Policy Act define cumulative effects as:

> *"The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions."* [2]

The Council on Environmental Quality recommends that an agency's analysis accomplish the following:

- Focus on the effects and resources within the context of the proposed action;
- Present a concise list of issues that have relevance to the anticipated effects of the proposed action or eventual decision;
- Reach conclusions based on the best available data at the time of the analysis;
- Rely on information from other agencies and organizations on reasonably foreseeable projects or activities that are beyond the scope of the analyzing agency's purview;
- Relate to the geographic scope of the proposed project; and
- Relate to the time period of the proposed project.

Please refer to the Renton to Bellevue Project Cumulative Effects Analysis Discipline Report in Appendix AA (on CD) for a complete discussion of the cumulative effects analysis.

[1] The federal agency charged with implementing the National Environmental Policy Act.
[2] 40 CFR 1508.7 Protection of Environment, Council on Environmental Quality, Cumulative Impact

Cumulative effects can be positive as well as negative depending on the environmental resource being evaluated. It is possible that some environmental resources can be both negatively and positively affected by the same proposed project.

How did we mitigate adverse cumulative effects associated with the project?

For the Renton to Bellevue Project to be consistent with regulatory guidance, reasonable measures to minimize adverse effects have been incorporated into the project design. The measures are a combination of mitigation and enhancements that include avoiding and minimizing impacts to wetlands, construction of noise walls, improvements to fish habitat, treatment of stormwater, and use of a traffic management plan.

What is the relationship between this cumulative effects analysis and that contained in the I-405 Corridor Program Final EIS?

The cumulative effects analysis for the Renton to Bellevue Project used the cumulative effects analysis in the *I-405 Corridor Program Final EIS* as a starting point. The I-405 Corridor Program cumulative effects analysis focused on air quality, energy, farmlands, fish and aquatic resources, surface water, and wetlands. However, for the Renton to Bellevue Project, neither energy nor farmlands were included in the cumulative effects analysis. Farmlands were determined not to be affected at all by the project. Energy was not analyzed because the difference in energy consumption at the regional level with or without the project was predicted to be inconsequential. The project-level analysis was then conducted, based on the results of scoping, agency consultations, and the anticipated direct and indirect effects on air quality, surface water, wetlands, and fish and aquatic habitat due to the Renton to Bellevue Project.

What are the time and geographic boundaries for this analysis?

When evaluating cumulative effects, the analyst must consider expanding the geographic study area beyond that of the proposed project, as well as expanding the time period to consider past, present, and future actions that may affect the environmental resources of concern.

The geographic scope of analysis is defined by the physical limits or boundaries of the Renton to Bellevue Project's effect on an environmental resource, as well as the boundaries of other activities that also may contribute to the effects on that environmental resource. The time period is determined by identifying timeframes that are both relevant to the project and reasonable. The time period and geographic boundaries can be different for each environmental resource evaluated.

The time period and geographic boundaries established for the cumulative effects analysis for the Renton to Bellevue Project were based on those used in the *I-405 Corridor Program Final EIS*, scoping, agency consultations, and the area affected by the project itself.

Geographic Boundaries

The geographic boundary for the project-level air quality analysis was set at 0.5 miles from the centerline of the project right of way. This boundary provided for consideration of the effects on air quality of other nearby projects. Effects on air quality for the overall Central Puget Sound Region were addressed previously in the *I-405 Corridor Program Final EIS*.

The geographic boundaries for the surface water, wetlands, and fish and aquatic habitat analyses were set at 1.0 miles from the centerline of the project right of way (Exhibit 6-1). Expanding the geographic area beyond that of the direct effect area of the Renton to Bellevue Project allowed a more comprehensive analysis of the cumulative effects on these environmental resources. This geographic area also included the area that was evaluated in the biological assessment prepared under the Endangered Species Act for the project.

Time Period Boundaries

The time period from 1960 through 2030 was set for all four environmental resources analyzed (air quality, surface water, wetlands, and fish and aquatic habitat). Using 1960 as the starting point for the analysis allowed an assessment of the changes that have occurred since the original construction of I-405. The year 2030 is the future year used in regional transportation planning documents.

Exhibit 6-1: Expanded cumulative effects study area

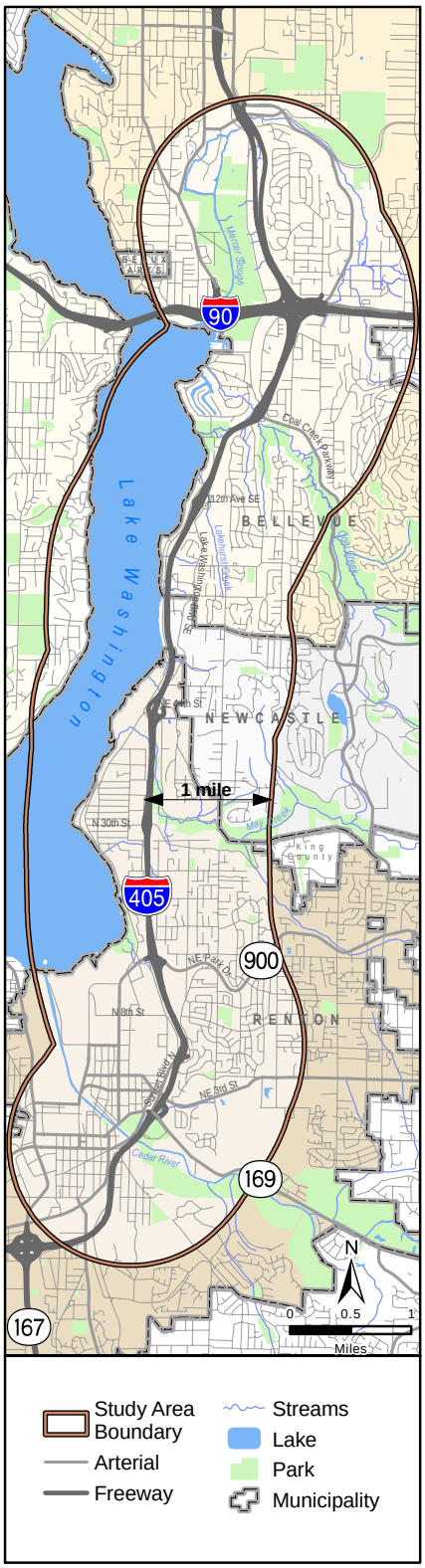
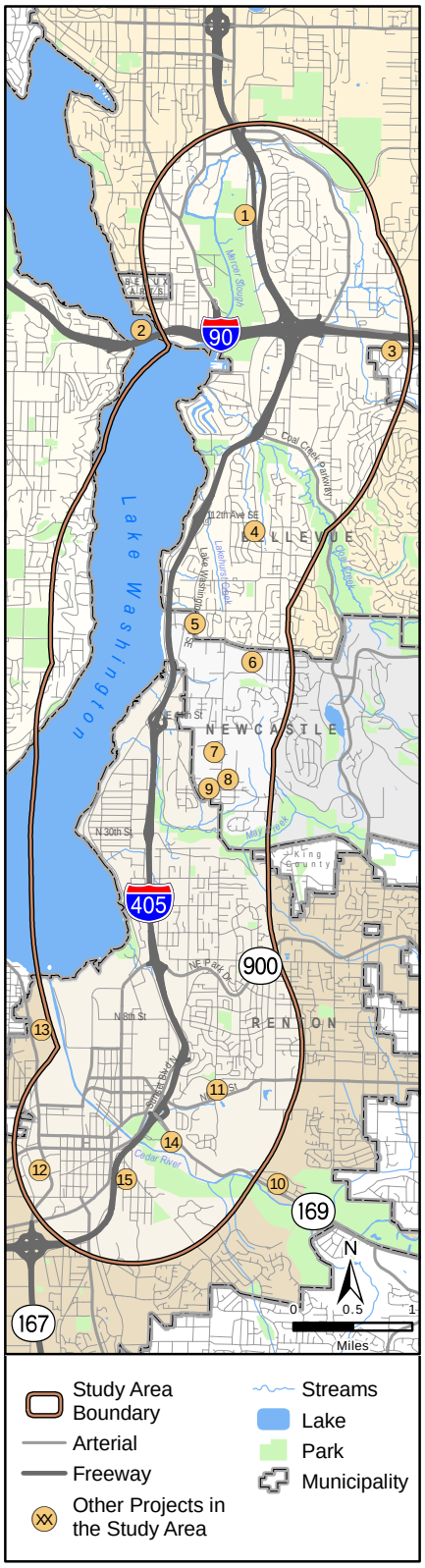


Exhibit 6-2: Projects considered in cumulative effects analysis



Under what circumstances were other projects included in the cumulative effects analysis?

For the effects of other major future projects to have been considered, the projects must be located within or nearby the geographic boundaries used for the cumulative effects analysis. The projects must also be reasonably foreseeable. For transportation projects, this typically means the projects are planned, approved, and funded or likely to receive funding in a relatively short period of time. Specific projects considered in the cumulative effects analysis are (Exhibit 6-2):

1. I-405, Bellevue Nickel Improvement Project (WSDOT);
2. I-90, Two-way Transit and HOV Operations (cities of Mercer Island, Seattle, and Bellevue; WSDOT; King County; FHWA; and FTA);
3. I-90, Eastgate Direct Access Ramps (WSDOT, Sound Transit, King County Metro and City of Bellevue);
4. 119th Avenue SE – SE 60th Street to Lake Heights Street (City of Bellevue);
5. 112th Avenue SE – SE 64th Street to Newcastle Way (City of Newcastle);
6. Newcastle Way – 112th Avenue SE to 129th Avenue SE (City of Newcastle);
7. 116th Avenue SE – SE 84th Street to SE 88th Street/ 112th Place SE – Western City Limit to 116th Avenue SE (City of Newcastle);
8. 116th Avenue SE – Newcastle Way to SE 84th Street (City of Newcastle);
9. SE 84th Street – SE 89th Place to 116th Avenue SE (City of Newcastle);
10. SR 169 HOV – 140th Way SE to SR 900 (City of Renton);
11. NE 3rd/NE 4th Street Corridor Improvements (City of Renton);
12. Rainier Avenue Improvement Project (City of Renton);
13. Boeing Renton Plant Site Redevelopment (Boeing, City of Renton);
14. SR 169 Improvements (City of Renton); and
15. I-405 Renton Nickel Improvement Project (WSDOT).

What has been the history of the environmental resources analyzed?

Air Quality

The Central Puget Sound Region has been witness to substantial changes in air quality since 1960. In 1978, air quality had degraded to the point that the Central Puget Sound Region was classified by the EPA as a non-attainment area for CO and ozone. The degradation was largely a result of the rise in vehicle miles traveled (VMT) associated with increasing population and urbanization.

Air quality improved over the next two decades as a result of technological improvements in emissions control equipment and more stringent regulations. This improvement enabled the EPA to re-designate the region as a maintenance area for CO and ozone in 1996. As described in the *I-405 Corridor Program Final EIS*, during that same two-decade period, freeway lane miles increased by approximately 50 percent while the region-wide VMT grew by approximately 200 percent. From 1970 to 1999, the average daily traffic on I-405 north of I-90 increased nearly 500 percent.

Because travel demand has exceeded the capacity of the roadway and transit network, the congestion on all highways, including I-405, has continued to worsen. Transportation improvements, such as the Renton to Bellevue Project, will help to lessen congestion and reduce the time vehicles sit idling in traffic, thereby lessening emissions.

However, in the future, while emissions from motor vehicles are expected to decline due to new regulations and technologies, the growth in VMT will ultimately result in an overall increase in the emissions (PSRC, 2004).

Surface Water

Lake Washington has seen considerable changes since 1960. Continued development around the lake has resulted in large portions of the surrounding watersheds becoming urban/ suburban in nature. With this development has come a substantial increase in the areas covered by impervious surface.

Until the early 1960s, the lake served as the receiving water for septic and sewage system discharges. The pollution combined with elevated temperatures in the summers caused the lake to

take on a cloudy, "pea soup" appearance. Water quality in the lake also continued to decline because of the contaminant loadings from increased runoff. The creation of the Municipality of Metropolitan Seattle (Metro) and the subsequent construction of regional wastewater treatment plants in Renton and Seattle, led to the elimination of municipal wastewater discharges to Lake Washington (except in the case of infrequent overflow events), resulting in dramatic improvements in water quality by the mid-1970s.

Portions of the streams in the project area have also undergone major changes. These have primarily come about simultaneously with conversion of natural areas to urbanized landscapes and included channelization, removal of woody debris from the streams, re-routings, bank armoring, loss of stream-side vegetation, heavy silt and pollutant loadings, and elevated summer water temperatures. Water in these streams ultimately reaches Lake Washington and affects water quality there.

Recognition of the declining ecological conditions in the streams and the lake set the stage for implementation of laws and regulations to curb this trend and provide for restoration of degraded stream habitats. By the 1970s, local municipalities began to recognize that some form of stormwater management was needed for new developments. Stormwater utilities were established and best management practices (BMPs) for the control of stormwater runoff were developed and implemented.

The *Puget Sound Water Quality Management Plan* was published in the late 1980s. The early 1990s brought the issuance of King County's *Surface Water Design Manual*, Ecology's *Stormwater Management Manual for the Puget Sound Basin*, and WSDOT's *Highway Runoff Manual*. Water quality treatment, and, in some cases, stormwater detention, became mandatory for all projects within areas draining to Puget Sound. Statutes such as the Clean Water Act (CWA), Growth Management Act (GMA), and the Shoreline Management Act (SMA) and their associated implementing regulations have provided additional guidance. Stormwater management requirements have continued to evolve and, in general, have become more stringent.

In general, the design standards for the Renton to Bellevue Project now require treatment for more than 100 percent of

new impervious surfaces and detention of the two-year through 50-year storm events except where stormwater can be directly discharged to the Cedar River and Lake Washington.

Wetlands

Numerous federal, state, and local laws, regulations, ordinances, and orders now govern activities in or near wetlands. That was not the case in 1960. The passage of the NEPA in 1969 required project proponents to evaluate the impacts of their projects on the environment including wetlands. The federal Clean Water Act prohibits the filling of wetlands unless authorized by a permit issued under Section 404 of the Act. The U.S. Army Corps of Engineers has authority over such actions and requires the permittee to restore, create, enhance, or preserve nearby wetlands as compensation for any losses.

Federal Executive Order 11990, issued in 1978, required all federal agencies to provide for wetland protection in their policies. The U.S. Department of Transportation complies (DOT Order 5660.1A) with that mandate during the planning, construction, and operation of transportation facilities. Additionally, legislation at the state level, as well as county and municipality ordinances, now regulate wetlands. The local ordinances governing wetlands and other sensitive/critical areas continue to evolve. In general, required mitigation and compensatory measures have become more stringent with the passage of time.

Wetland resources in the project area have continued to decline over time due to increased urbanization and the associated loss of natural systems and landscapes. While environmental awareness has increased through the passage of legislation, the number, size, and function of wetlands has continued to decline. However, the rate of decline has decreased and that trend is likely to continue. The goal of *No Net Loss* (at least as many acres of wetlands created as lost/filled) and improved avoidance, mitigation, and compensation measures are helping to restore wetland areas. Advanced scientific studies, refined regulatory requirements and programs, and use of adaptive management procedures will serve to further enhance the restoration trend.

Fish and Aquatic Habitat

Although fish populations fluctuate naturally, in general, their numbers have markedly declined, and the extent and quality of their habitat have decreased over the past century. Two major factors affecting fish populations in the Renton to Bellevue project area are harvest and habitat. This CEA focused on habitat.

As the human population and the extent of development in the project area have increased over time, aquatic habitat has been eliminated and/or degraded. Aquatic habitat alteration has taken the form of removal of forest cover and stream-side vegetation, channel modification, bank armoring, dredging, removal of woody debris from streams, routing of streams through culverts, alteration of natural stream flow regimes, and construction of barriers to fish passage.

The Washington State Salmonid Stock Inventory identifies five salmonid stocks within the I-405 Corridor Program area as "depressed": Cedar River sockeye, Lake Washington beach sockeye, Lake Washington/Sammamish tributary sockeye, Lake Washington/Sammamish tributary coho, and Lake Washington winter steelhead. A depressed stock is defined as "one whose production is below expected levels, based on available habitat and natural variation in survival rates, but above where permanent damage is likely." The number of adults that return to their spawning grounds for each of these stocks has been declining. Any cumulative adverse effect of an I-405 Corridor Program project could contribute to the continuance of such a downward trend (WSDOT 2002).

How will constructing the Renton to Bellevue Project contribute to cumulative effects?

Air Quality

The Renton to Bellevue Project and the other projects included in this CEA are expected to produce effects on air quality that are characteristic of constructing projects of this type. The effects could include temporary increases in particulate emissions that will depend on the level and type of activity, soil characteristics, weather, and equipment employed; CO and oxides of nitrogen in the exhaust of construction equipment powered by gasoline and diesel engines; increases in the levels of CO and oxides of nitrogen emitted from vehicles that are delayed while transiting through the work

areas; fugitive dust; and odors associated with the use of asphalt.

Minimization of the cumulative effects on air quality will be achieved by keeping exposed soil damp by spraying with water, covering all truck loads, using wheel washers, removing particulate matter deposited on public roads, covering dirt and debris piles, properly maintaining construction equipment, and communications and coordination with the proponents of other projects and appropriate local jurisdictions regarding the scheduling and routing of construction truck traffic to help eliminate or reduce delays encountered by local traffic. Such mitigation and coordination are usually facilitated by the local jurisdiction through traffic management and mitigation plans, haul road agreements, and other permitting requirements. With the mitigation measures in place and followed, construction-related cumulative effects on air quality contributed by the Renton to Bellevue Project and the other projects included in this CEA should be localized, temporary, and of low magnitude.

Surface Water

The Renton to Bellevue Project will include construction of a new storm drain system that will collect, treat, and discharge highway runoff from the new impervious surfaces and replaced pavement areas. The project will be constructed in accordance with federal and state technical guidance, permit conditions, and WSDOT specifications that will require the use of BMPs to control the rate of runoff and, where practical, to retain runoff on the site. Regardless, there will be the potential for some increased runoff entering some local waterways. However, the receiving waters and drainage systems that convey water to Lake Washington will each receive only a small percentage of their total flow from the construction areas.

Minimization of the Renton to Bellevue Project's contribution to cumulative effects on surface waters will be achieved through implementation of applicable BMPs and compliance with regulatory requirements and permit (for example, the National Pollutant Discharge Elimination System [NPDES] Construction Stormwater Permit) conditions. It is assumed that similar mitigation measures will be followed, where appropriate, for the other projects included in this CEA. As a

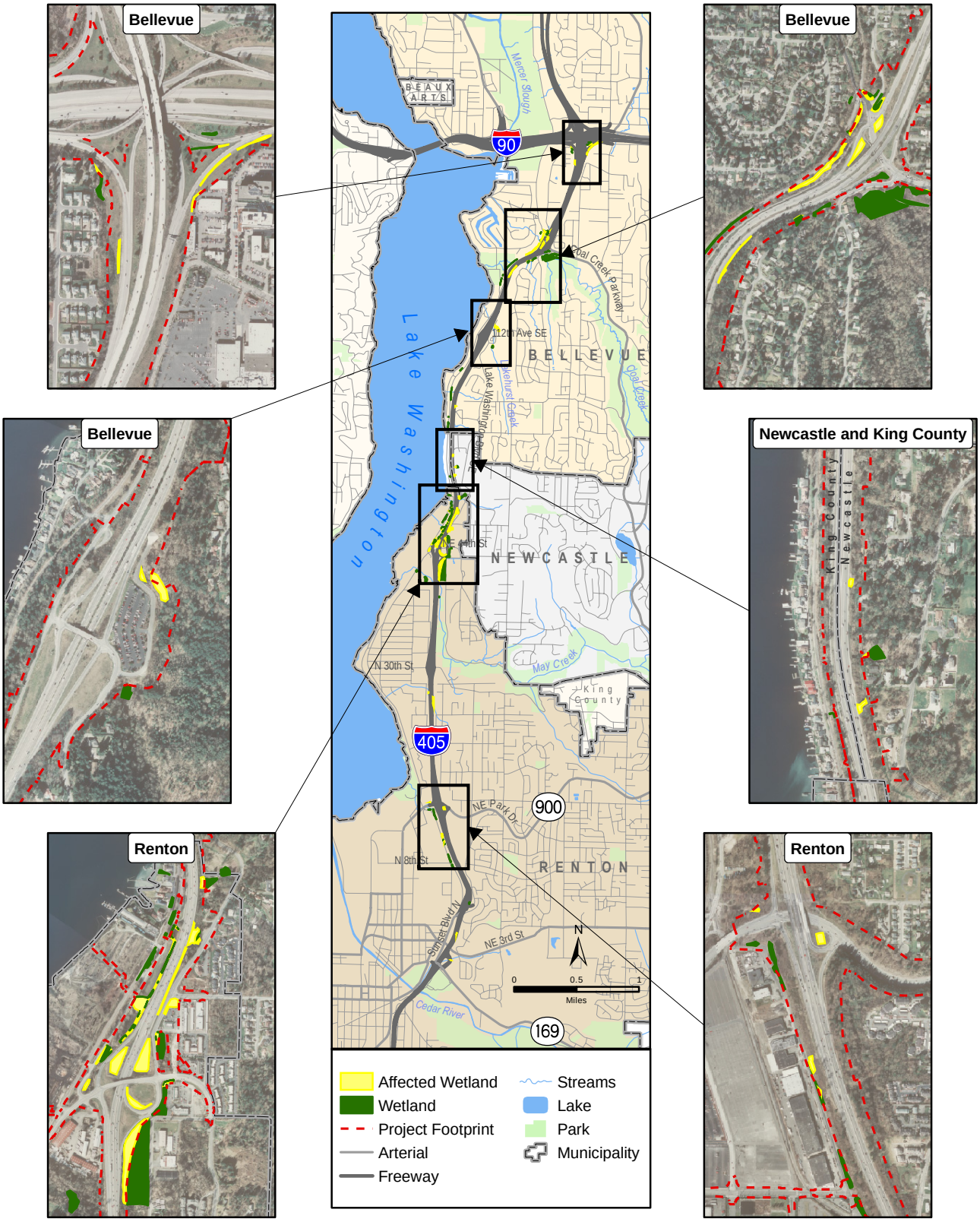
result, construction-related cumulative effects on surface waters attributable to the Renton to Bellevue Project and the other projects should be temporary and of low magnitude.

Wetlands

Sixty-three wetlands with a total area of approximately 20 acres were delineated within the project area for the Renton to Bellevue Project (Exhibit 6-3). Two-thirds of the wetlands within the project area are likely to provide value related to stormwater management functions including flood flow alterations, sediment removal, nutrient and toxicant removal, and erosion control. All of the wetlands within the project area have been disturbed to some extent by development, including the construction of I-405 and development in the surrounding area.

Based on the mitigation that will occur to compensate for the loss of the 5.5 acres, with the Renton to Bellevue Project, a positive contribution to cumulative effects on wetlands within the affected areas (more wetlands created/enhanced of greater value than filled/permanently affected) can be realized. Although the decision regarding the location and size of the mitigation site(s) has not been finalized, much of the compensation for wetlands affected will likely occur at the Springbrook Creek Wetland and Habitat Mitigation Bank. This will provide a safe, high-quality wildlife habitat away from the dangers of a roadside location. This same bank will likely also be used as mitigation for the filling of 1.7 acres of wetlands associated with the Renton Nickel Improvement Project. The Bellevue Nickel Improvement Project will permanently fill 0.9 acres of wetlands with mitigation likely to occur in Kelsey Creek Park.

Exhibit 6-3: Wetlands in the project area



Fish and Aquatic Habitat

Temporary minor loss of aquatic habitat and minor changes in stream flows will occur due to the construction of the Renton to Bellevue Project. These effects will be minimized through the use of BMPs, compliance with in-water work windows set by the fish and wildlife regulatory agencies, and by including avoidance measures in the project design.

WSDOT will create fish passage and instream habitat improvements that result in new access for salmonids to over 2,900 feet of stream upstream of I-405. Removing project stormwater discharge from Clover Creek will also enhance instream habitat values for all aquatic life upstream and downstream from the project area. The direct water quality benefit will enhance 2,800 feet of stream habitat downstream of the improvements.

The Renton and Bellevue Nickel Improvement projects, located to the south and north of the Renton to Bellevue Project, have the potential to directly affect fish and aquatic habitat in a similar temporary manner. Proper use and maintenance of BMPs will likely prevent any detectable cumulative effects due to construction of the projects. The I-90 Two-Way Transit and HOV Operations Project may involve in-water work in the Mercer Slough area, which may temporarily adversely affect nearshore habitats.

How will operation of the Renton to Bellevue Project contribute to cumulative effects?

Air Quality

The Renton to Bellevue Project will add capacity to I-405 and, thus, will improve traffic flow and result in a decrease in CO levels relative to existing conditions. The Renton to Bellevue Project will neither cause nor contribute to a violation National Ambient Air Quality Standards (NAAQS) for CO from both a project-specific standpoint as well as cumulatively, from the year of opening (2014) through the design year (2030). The other transportation projects included in this CEA may also help to reduce automobile use, improve efficiency of the transportation system, and decrease CO levels from existing conditions.

Surface Water

The Renton to Bellevue Project's contribution to cumulative effects on surface waters during operations will likely be positive. The greatest benefits will be gained through maintenance of the enhanced treatment for the new pavement areas and the retrofitted treatment of the 162 acres of existing pavement where runoff currently receives minimal treatment. The application and maintenance of water quality standards for the other projects including this CEA will likely result in the maintenance or improvement of existing water quality in discharges to surface waters in their respective areas of effect.

Wetlands

The operation of the Renton to Bellevue Project may provide a positive contribution to the cumulative effects on wetlands. That positive effect will result from the improvements in surface water quality and flows to streams in the area. Those improvements will be due to the Renton to Bellevue Project's enhanced treatment of the runoff from the new impervious surfaces and the establishment of enhanced water quality treatment for presently untreated impervious surfaces. Similar positive effects may result, but to a lesser degree, from the Bellevue and Renton Nickel Improvement projects.

Fish and Aquatic Habitat

Proper maintenance and continued operation of the Renton to Bellevue Project facilities should maintain its positive contribution to cumulative effects on fish and aquatic habitat.

Similar positive effects may also result from the Bellevue and Renton Nickel improvement projects and the I-90 Two-Way Transit and HOV Operations Project. Additionally, proper maintenance of the improvements provided by the Kelsey Creek Park Stream Restoration Project and the Springbrook Creek Wetland and Habitat Mitigation Bank will maintain their positive cumulative effects on fish and aquatic habitat as well.

What effects would result if the No Build Alternative were adopted?

For the No Build Alternative, no construction would occur and, thus, there would be no construction-related effects to air quality, surface water, wetlands, or fish and aquatic habitat due to the Renton to Bellevue Project.

The Air Quality Discipline Report for the Renton to Bellevue Project indicates that although emissions levels would not exceed the NAAQS for CO, the No Build Alternative would not provide any relief to traffic congestion and, thus, may result in an increased rate of degradation of air quality relative to the Build Alternative.

Some wetlands in the Renton to Bellevue project area currently receive untreated runoff from stormwater facilities that do not meet treatment standards. To the degree that those wetlands are adversely affected by the existing water quality of the runoff, those effects would likely continue.

Assuming that the other projects considered in this CEA are constructed and placed in operation, the cumulative effects due to those projects would be as noted under the construction and operations cumulative effects discussion above.

What measures are proposed to minimize cumulative effects?

No measures, beyond those incorporated in the project design, are necessary.

CHAPTER 7

List of Preparers

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Ginette Lalonde PARSONS BRINCKERHOFF	*Noise Discipline Report*	BS, Civil Engineering	7
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CHAPTER 8

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