

## **APPENDIX C: CUMULATIVE EFFECTS ANALYSIS TECHNICAL MEMORANDUM**

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



**Corridor Program**

Congestion Relief & Bus Rapid Transit Projects

## *CUMULATIVE EFFECTS ANALYSIS TECHNICAL MEMORANDUM*

*February 2008*





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## SUMMARY

### OBJECTIVE OF THIS ANALYSIS

This technical memorandum presents an analysis of the potential contribution to cumulative effects on selected environmental resource areas resulting from the construction and operation of the I-405, NE 8th Street to SR 520 Improvement Project. The potential effects of other major projects within one mile of the I-405, NE 8th Street to SR 520 Improvement Project are also included in this cumulative effects analysis (CEA).

### CUMULATIVE EFFECTS AND WHY WE STUDY THEM

The Council on Environmental Quality's (CEQ) regulations implement the procedural provisions of the National Environmental Policy Act (NEPA). The CEQ/NEPA regulations 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."*<sup>1</sup>

Cumulative effects are important to consider during the construction and operation of a project. While project effects may be minor when viewed in the individual context of direct and indirect effects, they can add to the effects of other actions and eventually lead to a measurable environmental change. Because cumulative effects can be separated from a proposed project in time and location, their measurement can be difficult to quantify and assess. The CEQ recommends that a CEA 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.

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<sup>1</sup> 40 CFR 1508.7 Protection of Environment, Council on Environmental Quality, Cumulative Impact.

- Relate to the time period of the proposed project.

It is possible that some environmental resources can be negatively, and others positively, affected by the same proposed project. Cumulative effects can also be positive as well as negative depending on the environmental resource being evaluated. The methodology used for this CEA is presented in Appendix A.

## **RELATIONSHIP TO THE I-405 CORRIDOR PROGRAM CUMULATIVE EFFECTS ANALYSIS**

This CEA for the I-405, NE 8th Street to SR 520 Improvement Project used the analysis in the *I-405 Corridor Program NEPA/SEPA Final Environmental Impact Statement*<sup>2</sup> as a starting point. The I-405 Corridor Program CEA focused on air quality, energy, farmlands, aquatic resources, surface waters, and wetlands. Neither energy nor farmlands were included in the CEA for the I-405, NE 8th Street to SR 520 Improvement Project. Farmlands will not 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 is based on the results of scoping, agency consultations, and the anticipated direct and indirect effects on air quality, surface waters, wetlands, and aquatic resources due to the I-405, NE 8th Street to SR 520 Improvement Project as well as the other projects considered in this CEA.

## **GEOGRAPHIC BOUNDARIES AND TIME PERIOD**

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 limits 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 I-405, NE 8th Street to SR 520 Improvement Project's effect on an environmental resource, as well as the boundaries of other activities that also may contribute to effects on that environmental resource. The time period is determined by identifying time limits that are both relevant to the project and reasonable. The time period and geographic boundaries can be different for each environmental resource evaluated. The geographic boundaries and time period established for the I-405, NE 8th Street to SR 520 Improvement Project CEA were based on the *I-405 Corridor Program Final EIS*, scoping, agency consultations, and the area directly affected by the project itself.

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<sup>2</sup> WSDOT, 2002a.

## **Geographic Boundaries**

The geographic boundary for the air quality analysis was set at one-half mile from the centerline of the project right-of-way. This boundary provided for consideration of the effects on air quality of other nearby projects included in the CEA. 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 wetlands, surface waters, and aquatic resources analyses were set at one mile from the centerline of the project right-of-way. Expanding the geographic area beyond that of the direct effect area of the I-405, NE 8th Street to SR 520 Improvement Project allowed a more comprehensive analysis of the cumulative effects on those environmental resources resulting from the Improvement Project combined with the other projects considered in the CEA.

## **Time Period**

The time period from 1960 through 2030 was set for the four environmental resources that were analyzed (air quality, surface waters, wetlands, and aquatic resources). Using 1960 as the starting point for the analyses 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.

## **MAJOR PROJECTS INCLUDED IN THIS CUMULATIVE EFFECTS ANALYSIS**

For the effects of other major<sup>3</sup> projects to be considered, the projects must be located within or near the geographic boundaries used for this CEA. The projects must also be reasonably foreseeable, which typically means they are planned, approved, and funded. Specific projects (see Appendix A for descriptions) considered in this CEA are:

- NE 10th Street Extension (City of Bellevue/WSDOT)
- Overlake Hospital Medical Center (OHMC) Expansion
- I-405, South Bellevue Widening Project (WSDOT)
- I-405, SR 520 to I-5 Improvement Project (WSDOT)
- SR 520 Bridge Replacement and High-Occupancy Vehicle (HOV) Project (WSDOT)
- Various Major Projects in Downtown Bellevue (Various Developers)

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<sup>3</sup> Minor capital improvement projects such as sidewalk additions, lane restriping, changes in signalization, and water and sewer line replacements are not included in this CEA.

## **HOW ADVERSE CUMULATIVE EFFECTS WILL BE MITIGATED**

For the I-405, NE 8th Street to SR 520 Improvement Project to be consistent with regulatory guidance, reasonable measures to minimize adverse effects have been incorporated into the project design. The measures combine avoidance, mitigation, and enhancement project activities, some of which include minimizing effects to wetlands, improving fish habitat, treating stormwater, and using traffic management plans.

## **POTENTIAL CUMULATIVE EFFECTS DURING CONSTRUCTION**

The following summarizes the I-405, NE 8th Street to SR 520 Improvement Project's anticipated contribution to cumulative effects to air quality, surface waters, wetlands, and aquatic resources during its construction.

**Air Quality** – localized, temporary, minor effects.

**Surface Waters** – localized, temporary effects of low magnitude.

**Wetlands** – 0.3 acre of wetland permanently filled, 0.05 acre of wetland temporarily affected.

**Aquatic Resources** – some very minor loss or degradation of aquatic habitat, changes to over-water cover, and temporary, short-term decreases in water quality to an unnamed tributary to Sturtevant Creek.

## **POTENTIAL CUMULATIVE EFFECTS DURING OPERATION**

The following summarizes the I-405, NE 8th Street to SR 520 Improvement Project's anticipated contribution to cumulative effects to air quality, surface waters, wetlands, and aquatic resources during its operation.

**Air Quality** – maintenance or decrease in carbon monoxide (CO) levels from existing levels – no violations of air quality standards.

**Surface Waters** – the proposed stormwater treatment system will treat all the new impervious area, and some of the existing impervious area that currently is untreated. As a result, overall, water quality will improve in the study area. The project will have a negligible effect on groundwater resources.

**Wetlands** - a positive effect is likely because of improved water quality in discharges to wetlands in some areas. Also, 0.5 acre of wetland mitigation at Kelsey Creek Park will provide high-quality wetlands and habitats.

**Aquatic Resources** - potential for positive effects from improved water quality and replacement of functions and values at a stream mitigation site on the mainstem of Sturtevant Creek just south of the project.

## **POTENTIAL CUMULATIVE EFFECTS ASSOCIATED WITH THE NO BUILD ALTERNATIVE**

Construction-related and operational effects on air quality, surface waters, wetlands, and aquatic resources resulting from the I-405, NE 8th Street to SR 520 Improvement Project would not occur.

Improvements and enhancements associated with the I-405, NE 8th Street to SR 520 Improvement Project would not occur. There would be no relief to traffic congestion and, as a result, the rate of localized air quality degradation could increase. There would be no improvements to existing water quality treatment facilities that do not meet current standards. No compensatory mitigation would be added to the Kelsey Creek mitigation site.

## **MEASURES TO AVOID OR MINIMIZE ADVERSE CUMULATIVE EFFECTS**

No measures, beyond those incorporated in the project design or listed in the air quality, water resources, and ecosystems discipline reports, will be necessary.

## **UNAVOIDABLE ADVERSE CUMULATIVE EFFECTS**

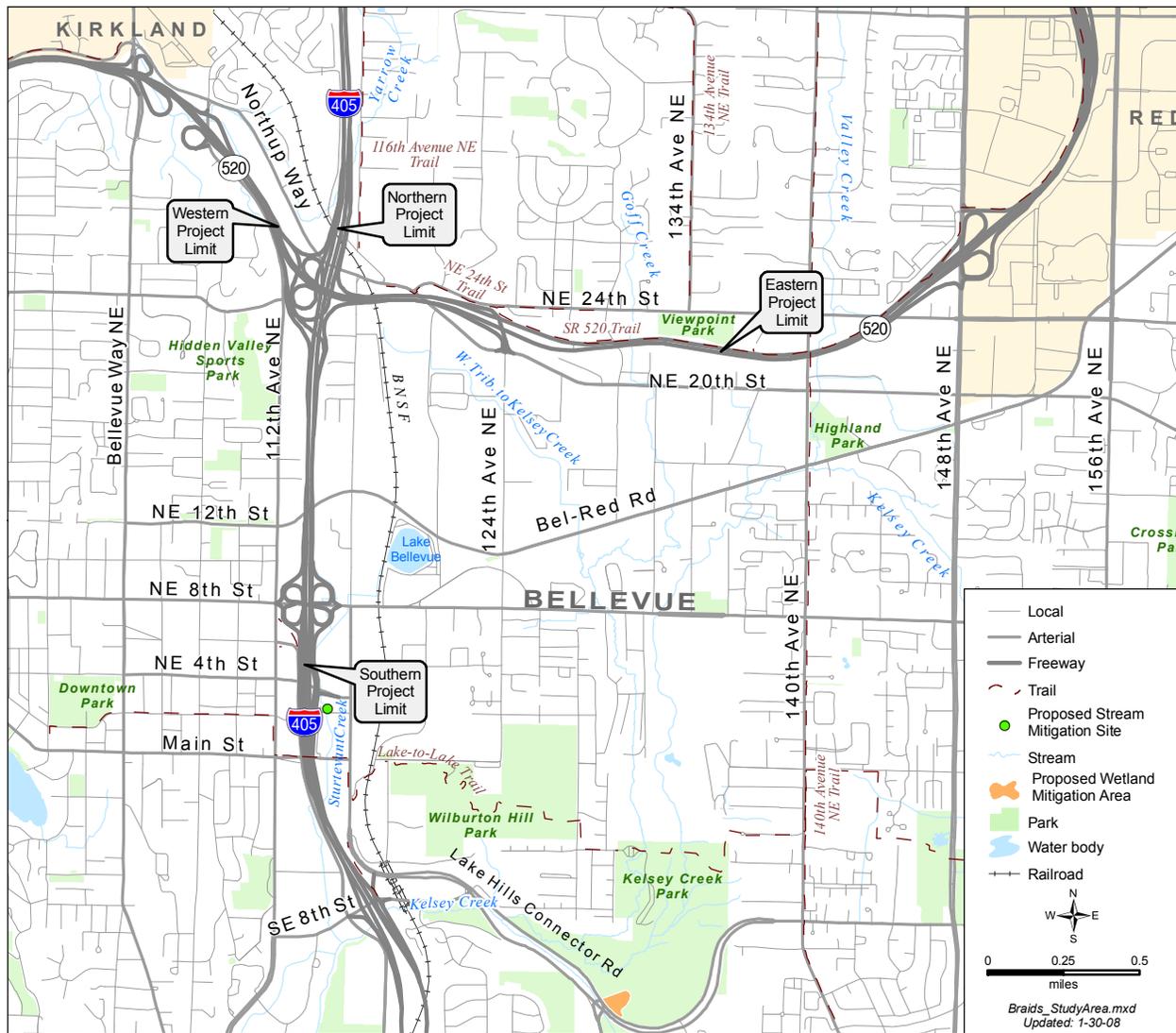
No unavoidable substantial adverse cumulative effects are anticipated due to construction and operation of the I-405, NE 8th Street to SR 520 Improvement Project.

## PROJECT DESCRIPTION

WSDOT is proposing to construct the I-405, NE 8th Street to SR 520 Improvement Project to improve safety and reduce congestion in the vicinity of the I-405 and SR 520 interchange within the city of Bellevue. As shown in Exhibit 1, the project extends approximately 1.5 miles north along I-405, from south of NE 8th Street to the SR 520 interchange, and approximately 1.6 miles east along SR 520, from the I-405 interchange to east of 134th Avenue NE.

The improvements will benefit the public by reducing congestion for the public and freight vehicles, improving safety, improving access and circulation to and from local

**Exhibit 1: Project Location and Vicinity**



streets, and providing opportunities for environmental improvements.

This technical memorandum analyzes two alternatives, the Build Alternative and the No Build Alternative. The proposed roadway improvements for the Build Alternative, from south to north on I-405, and west to east on SR 520, are described below.

## **BUILD ALTERNATIVE**

### ***Northbound I-405 to Eastbound SR 520 Improvements***

- Reconfigure the existing northbound NE 4th Street on-ramp to become an auxiliary lane that exits to SR 520 and northbound I-405 as part of a two-lane exit ramp.
- Reconstruct portions of the NE 8th Street on- and off-ramps to northbound I-405. The on-ramp will be reconstructed at a lower grade than the I-405 mainline.
- Rebuild the NE 12th Street bridge crossing over I-405 to accommodate the new ramps.
- Construct a northbound on-ramp to SR 520 from a new NE 10th Street bridge crossing; the bridge crossing will be constructed as part of a separate project prior to constructing the on-ramp.
- Construct grade-separated ramps to divide traffic entering northbound I-405 from NE 8th Street and traffic exiting I-405 to SR 520.
- Construct grade-separated ramps to divide traffic entering eastbound SR 520 from northbound I-405 and traffic exiting eastbound SR 520 to 124th Avenue NE.
- Shift eastbound SR 520 mainline travel lanes toward the median.
- Extend the ramp from northbound I-405 to eastbound SR 520 on a collector-distributor system through the 124th Avenue NE interchange to merge with the existing eastbound SR 520 mainline just east of 134th Avenue NE.
- Reconstruct the 124th Avenue NE interchange off-ramp.
- Relocate an existing noise barrier. The new barrier will be approximately 1,585 feet long and 20 feet high.
- Construct several retaining walls needed to allow for the proposed widening of I-405.

### ***SR 520 to Southbound I-405 Improvements***

- Reconfigure the ramps from SR 520 to southbound I-405 to improve traffic flow. The westbound SR 520 to southbound I-405 ramp will become a dedicated

auxiliary lane, and on-ramp traffic will no longer be required to immediately merge with southbound I-405 mainline traffic. The eastbound SR 520 to southbound I-405 ramp will merge with the dedicated auxiliary lane.

### ***Southbound I-405 to SR 520 Improvements***

- Realign the southbound I-405 to eastbound SR 520 loop ramp.
- Realign eastbound SR 520 to match the proposed improvements.

### ***Other Improvements***

Other improvements proposed along the I-405 and SR 520 corridors within the project limits include retaining walls, relocating an existing noise barrier, stormwater culvert improvements, and stormwater management system improvements. Adverse effects on wetlands and their buffers will be compensated for at a wetland mitigation site located within the boundaries of Kelsey Creek Park southeast of the southern project limits. Mitigation at this site was approved as part of the I-405 Bellevue Nickel Improvement Project. Mitigation for unavoidable effects on an unnamed tributary to Sturtevant Creek will be in-kind and will be located within WSDOT right-of-way on the east side of I-405 and south of NE 4th Street. The location of the wetland and stream mitigation site is shown in Exhibit 1.

### ***Construction Staging***

Construction funding is currently available for only some of the proposed improvements in the Build Alternative. Consequently, the project will be constructed in stages. The funded first stage will include the northbound I 405 improvements, including the braided ramps, the NE 12th Street bridge reconstruction, and the northbound NE 10th Street on-ramp. Additionally, one of the three proposed collector-distributor lanes from northbound I 405 to eastbound SR 520 will be constructed. This collector-distributor lane will cross over the existing NE 124th Street on-ramp before merging with SR 520. Construction of these funded improvements is scheduled to begin in 2009 and will be completed in approximately 3 years.

The unfunded project improvements will include the remaining two lanes of the three-lane collector-distributor system, improvements from southbound I 405 to the eastbound SR 520 collector-distributor, and the improvements from eastbound and westbound SR 520 to southbound I 405. Construction of these remaining improvements depends on when project funding becomes available.

## **NO BUILD ALTERNATIVE**

The No Build Alternative assumes the new NE 10th Street bridge across I-405 that is being constructed as part of another project will be in place. The No Build Alternative assumes that only routine activities such as road maintenance, repair, and minor safety improvements would take place over the next 20 years. The No Build Alternative does not include improvements that would increase roadway capacity, reduce congestion, or improve safety on I-405 or SR 520. For these reasons, it does not satisfy the project's purpose—to reduce congestion created by weaving traffic on I-405 and SR 520.

The No Build Alternative has been evaluated in this technical memorandum to establish a reference point for comparing the effects associated with the Build Alternative.

## BACKGROUND

### **METROPOLITAN TRANSPORTATION PLAN AND OTHER REGIONAL ACTIONS**

The following subsections briefly describe greater Seattle area transportation planning documents and projects that have a bearing on the I-405 Corridor Program. Transportation investments identified in these plans are discussed here because they are reasonably foreseeable and they relate to the CEA time period and geographic boundaries for the I-405, NE 8th Street to SR 520 Improvement Project.

#### ***Metropolitan Transportation Plan***

The *Metropolitan Transportation Plan* (MTP) was first adopted in 1995 and includes specific provisions that relate to the I-405 corridor. The Puget Sound Regional Council (PSRC) developed *Destination 2030*<sup>4</sup>, a 2001 update of the 1995 MTP that emphasizes an integrated multi-modal transportation system, describes the major regional components of the system, and acknowledges that capacity enhancements are needed to improve mobility on regional roadways. *Destination 2030* also identifies, analyzes, and develops solutions to regional transportation problems. According to *Destination 2030*, vehicle miles traveled (VMT) will increase by 45 percent and the population by 50 percent by 2030. To address these increases, the MTP calls for aggressive transportation investments and indicates that, with those investments, net effects on system performance should be relatively minor. *Destination 2030* takes into account different growth patterns in the region and calls for focused growth in urban centers. In 2002, the PSRC revised *Destination 2030* to incorporate the transportation improvements proposed in the I-405 Corridor Program selected alternative.

#### ***Sound Transit Future Investments***

Since 1996, Sound Transit has implemented *Sound Move*, the first phase of a 10-year regional transit long-range vision. *Sound Move* includes regional bus service, high-occupancy vehicle (HOV) access improvements, park-and-ride lots, and commuter rail and light rail. All *Sound Move* commitments are included in *Destination 2030* and the I-405 Corridor Program alternatives. A variety of these regional high-capacity transportation (HCT) investments are being implemented along the I-405 corridor.

Some of the *Sound Move* commitments programmed for the I-405 corridor are under construction or have been completed. Sound Transit began Phase II planning in mid-2001 and expects technical work to continue over several years. Projects (Bellevue HOV

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<sup>4</sup> PSRC, 2001.

Access, Bellevue Rider Services Building, Bellevue Transit Center) in the I-405, NE 8th Street to SR 520 Improvement Project immediate area have all been completed.

## **LAND USE, POPULATION GROWTH, AND HIGHWAYS IN THE REGION, THE I-405 CORRIDOR, AND THE PROJECT STUDY AREA**

The following subsections provide a brief discussion of land use and population growth-oriented policies, documents, and trends that apply to the region, the I-405 corridor, and the I-405, NE 8th Street to SR 520 Improvement Project.

### ***Washington State Growth Management Act***

During the late 1980s and early 1990s, policies, statutes, and regulations enacted at the state, regional, and local levels defined growth boundaries and population density for local jurisdictions over a 20-year period. Central to these efforts was Washington State's Growth Management Act<sup>5</sup> (GMA).

The GMA, a state law passed by the Legislature in 1990 and amended in 1991, addressed the negative consequences of unprecedented population growth and suburban sprawl. The law directed all the state's cities and counties to plan for growth, with more extensive requirements imposed on those cities and counties experiencing the largest amount of growth. The GMA defined urban growth areas, designated urban centers, established density targets in those urban centers, and identified minimum levels of services for statewide infrastructure. The GMA requirements also provide for consistency among transportation, capital facilities, and land use plans.

### ***VISION 2020***

*VISION 2020* describes regional land use patterns consistent with GMA policies. Comprehensive plans for cities in the study area were developed within the framework of *VISION 2020*. *Destination 2030* describes the regional transportation system required to support planned growth. The I-405 Corridor Program action alternatives are consistent with the GMA in that they support implementing the envisioned regional land use patterns. *VISION 2020* focuses growth into the urban growth areas defined by each county, establishes a multi-center approach to development that promotes a jobs/housing balance, and plans for needed transportation improvements. It specifies that improvements should occur at the same time as employment growth to implement the infrastructure concurrency requirements of the GMA.

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<sup>5</sup> RCW 36.70A Growth Management – Planning by Selected Counties and Cities.

## **County-Wide Planning Policies**

King, Pierce, and Snohomish Counties worked with local cities and took the lead in developing and adopting County-wide Planning Policies (CWPP). The CWPP integrates land use planning with transportation planning policies. Cities, including the Eastside cities (cities east of Lake Washington) within the study area, adopted the CWPP to help implement the GMA and *VISION 2020*. The CWPP supports the urban center concept. Some urban centers are within the I-405 project corridor. All the local jurisdictions in the study area adopted comprehensive plans in accordance with the requirements of the GMA, CWPP, and PSRC multi-county planning policies. The comprehensive plans include transportation elements that are certified by PSRC to conform to the transportation planning elements of the GMA, *VISION 2020*, and the MTP. The concurrency requirements of the transportation elements require key infrastructure be built or planned for within 6 years of any proposed development. The I-405 Corridor Program master plan generally supports the applicable local transportation plans.

## **Historical Land Use Changes and Trends**

The Puget Sound region has experienced substantial population growth since 1960. The 2000 population of more than 3 million is expected to increase to nearly 5 million by 2030. Eastside communities that were largely rural in nature in the early 1960s were gradually transformed to rural/suburban and then to suburban/urban. This land use change was made easier by major transportation improvements such as the first Lake Washington floating bridge (now I-90) connecting Seattle to the Eastside via Mercer Island, the second Lake Washington floating bridge (now SR 520), and I-405 construction. Establishing Microsoft and other “high-tech”-oriented businesses in the mid-1980s and 1990s along the I-405 corridor also played a key role in land use change. Identifiable urban centers (for example, Bellevue, Kirkland, and Redmond) emerged, increasing pressure to improve movement of goods and people along the I-405 corridor.

## **Land Use Plans and Policies in the Project Study Area**

The State of Washington Local Project Review Act<sup>6</sup> and associated state-implementing rules<sup>7</sup> provide ways for local governments to determine whether projects are consistent with the GMA-required comprehensive plans. The GMA contains a goal for each of the following topics:

- Urban Growth

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<sup>6</sup> RCW 36.70B Local Project Review.

<sup>7</sup> WAC 365-197 Washington State Department of Community, Trade, and Economic Development – Project Consistency.

- Transportation
- Economic Development
- Permits
- Open Space and Recreation
- Citizen Participation and Coordination
- Historic Preservation
- Reduction of Sprawl
- Housing
- Property Rights
- Natural Resource Industries
- Environment
- Public Facilities and Services
- Shorelines

The transportation-related goal is to "...encourage efficient multi-modal transportation systems that are based on regional priorities and coordinated with county and city comprehensive plans."

In addition, the GMA identifies several planning requirements that apply to roads and highways:

- Adoption of concurrency regulations, ensuring that transportation strategies or improvements are in place at the time of development or within 6 years to meet local level of service (LOS) requirements. Local LOS requirements do not apply to "highways of statewide significance", such as I-405 and SR 167. For highways of statewide significance, local jurisdictions are to evaluate the effects of land use on the state facility and the differences between local standards and the state LOS standard for urban facilities.
- Highways of statewide significance are considered to be one type of "essential public facility". Essential public facilities are typically difficult to site. Local comprehensive plans are required to address such facilities and may not prohibit their siting.
- Local governments are encouraged to coordinate or consolidate their processes for reviewing permitting and environmental planning requirements for major transportation projects.

An additional primary consideration is consistency with local zoning and shoreline master programs.

The I-405, NE 8th Street to SR 520 Improvement Project is located entirely within the city of Bellevue. Local land use plans and policies address cooperation among jurisdictions; transit and multimodal systems; compatibility and policies that influence design; and essential public facilities. According to the conclusions presented in the *Land Use Patterns, Plans, and Policies Discipline Report*,<sup>8</sup> the I-405, NE 8th Street to SR 520 Improvement Project is consistent with the local jurisdiction's plans and policies, and the local jurisdiction's plans and policies are generally supportive of the project improvements.

## REGULATORY CONSIDERATIONS

### *Air Quality*

Air quality in the project area is regulated by the U.S. Environmental Protection Agency (EPA), Washington State Department of Ecology (Ecology), and the Puget Sound Clean Air Agency (PS Clean Air). Under the Clean Air Act (CAA), the EPA has established the National Ambient Air Quality Standards (NAAQS), which specify maximum concentrations for carbon monoxide (CO), particulate matter (PM) less than 2.5 micrometers in size (PM<sub>2.5</sub>) and 10 micrometers in size (PM<sub>10</sub>), ozone (O<sub>3</sub>), sulfur dioxide (SO<sub>2</sub>), lead, and nitrogen dioxide (NO<sub>2</sub>).

Transportation conformity ensures that transportation activities (for example, plans, programs, and projects) are reviewed and evaluated for their effects on air quality prior to funding or approval. Such plans, programs, and projects may not cause or contribute to new air quality violations, worsen existing violations, or interfere with the timely attainment of air quality standards or the required interim emissions reductions toward attainment.<sup>9</sup>

Transportation plans must provide for the timely implementation of Transportation Control Measures (TCMs) from an applicable maintenance plan. TCMs are projects, programs, and actions that will help reduce or eliminate the severity or number of NAAQS violations and that will help attain and maintain NAAQS standards. TCMs can be strategies to increase the efficiency of existing transportation facilities, reduce travel demand, or lower the amount of emissions in vehicles, leading to measurable vehicle emissions reductions.<sup>10</sup>

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<sup>8</sup> WSDOT, 2007a.

<sup>9</sup> PSRC, 2004.

<sup>10</sup> PSRC, 2004.

A State Implementation Plan (SIP) is required under the CAA and provides a blueprint for how maintenance and non-attainment areas will meet NAAQS. Positive findings of conformity are required under the CAA, the Transportation Equity Act (TEA) for the 21st Century (TEA-21), and the Clean Air Washington Act (CAWA), and will allow the Central Puget Sound Region to proceed with implementation of transportation projects in a timely manner.<sup>11</sup>

The I-405 project corridor lies within a CO maintenance area. Air quality emissions in the Puget Sound Region are currently managed under the provisions of an Air Quality Maintenance Plan (AQMP) for CO. The current plan was developed by PS Clean Air and Ecology and was approved by the EPA in 2004. Any regionally substantial transportation project in the Puget Sound air quality maintenance areas must conform to the AQMP. As noted previously, conformity is demonstrated by showing that the project will not cause or contribute to any new violation of any NAAQS, not increase the frequency or severity of any existing violation of any NAAQS, and not delay timely attainment of the NAAQS.<sup>12</sup>

### **Water Quality**

The federal Water Pollution Control Act, better known as the Clean Water Act (CWA), regulates discharges of pollutants to surface waters of the United States. The CWA is codified in 33 U.S. Code (USC) 1251 et seq. which states that the goal of the CWA is “to restore and protect the chemical, physical, and biological integrity of the nation’s waters.” The EPA has delegated the authority to administer provisions of the CWA in Washington State (Revised Code of Washington (RCW) 90.48.260) to Ecology. In turn, Ecology establishes water quality standards (WQS) under its delegated CWA authority. Ecology uses those standards to protect and maintain beneficial uses of water bodies when issuing discharge permits, and in reviewing proposed projects to ensure that the quality of surface waters is protected.

The primary method used to ensure that water bodies meet WQS is the National Pollutant Discharge Elimination System (NPDES) permit program, established under CWA Section 402 (33 USC 1342). Under the NPDES program, any person responsible for the discharge of a pollutant or pollutants above a certain threshold directly into surface waters of the United States from any point source must apply for and obtain a permit. CWA Section 402 requires the EPA to review and grant permits for any point-source discharge of designated pollutants, which include 126 priority toxic pollutants as well as various “conventional” pollutants.

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<sup>11</sup> PSRC, 2004.

<sup>12</sup> WSDOT, 2008a.

Any activity that requires a federal license or permit and that might result in the discharge of a pollutant into waters of the United States is required to obtain a Water Quality Certification under Section 401 of the CWA. Section 401 certification is administered by the state in which the discharge originates. Certification ensures that the discharge complies with applicable standards of the CWA. Ecology administers this program in Washington State (RCW 90.48.260).

### **Wetlands**

Numerous federal, state, and local laws, regulations, ordinances, and orders govern activities in or near wetlands. That was not the case in 1960. NEPA's passage in 1969 required agencies to evaluate the effects of their projects on the environment, including wetlands. 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 (DOT) complies<sup>13</sup> with that mandate during the planning, construction, and operational phases of transportation facilities and projects. Activities in wetlands are also regulated by CWA Section 404 permitting requirements administered by the U.S. Army Corps of Engineers. Additionally, legislation at the state level, such as SEPA and GMA, as well as county and municipality ordinances, regulate wetlands. The local ordinances governing wetlands and other sensitive/critical areas continue to evolve. The required mitigation and compensatory measures have become more stringent.

### **Aquatic Resources**

Prior to 1966, authority for wildlife protection rested primarily with the states, except where the wildlife was highly migratory or where wildlife taken in violation of state or federal law was transported across state boundaries. In response to a concern that various species had become or were in danger of becoming extinct, the federal government began to enact legislation protecting endangered and threatened fish, wildlife, and plants. Congress' efforts culminated with the passage of the Endangered Species Act (ESA) of 1973 (Public Law 93-205, 16 USC 1531 et seq.). Under the ESA, the Secretary of the U.S. Department of Interior, through the U.S. Fish and Wildlife Service (USFWS) has responsibility for plants, wildlife, and inland fishes. The Secretary of Commerce through the National Marine Fisheries Service (NMFS) is responsible for implementing the ESA with respect to ocean-going fish and marine animals. The USFWS and the NMFS are collectively referred to as the "Services."

The 1996 Sustainable Fisheries Act amended federal fisheries management regulations to require identification and conservation of habitat that is "essential" to federally-managed fish species. Essential habitat is defined as "those waters and substrate

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<sup>13</sup> DOT Order 5660.1A.

necessary to fish for spawning, breeding, feeding, or growth to maturity.” The Pacific Fishery Management Council (PFMC) is the body responsible for reviewing relevant habitat issues in the Pacific Northwest. The PFMC has designated Essential Fish Habitat (EFH) for the Pacific salmon fishery, federally-managed groundfish, and coastal pelagic fisheries. Federal agencies must consult with NMFS on all activities, or proposed activities, authorized, funded, or undertaken by the agency that may adversely affect EFH. The Pacific salmon management unit includes Chinook (*Oncorhynchus tshawytscha*), coho (*O. kisutch*), and pink (*O. gorbuscha*) salmon. The designation is not limited to ESA-listed species. The EFH designation for the Pacific salmon fishery includes all those streams, lakes, ponds, wetlands, and other water bodies currently or historically accessible to salmon in Washington, Oregon, Idaho, and California, except above the impassible barriers identified by the PFMC.<sup>14</sup>

On March 29, 1999, NMFS listed the Puget Sound Chinook salmon as a threatened species.<sup>15</sup>

On November 1, 1999, the USFWS listed the Coastal-Puget Sound distinct population segment (DPS) of bull trout (*Salvelinus confluentus*) as a threatened species. The Coastal-Puget Sound bull trout population encompasses all Pacific Coast drainages within Washington, including Puget Sound. Because bull trout and Dolly Varden (*S. malma*) are virtually impossible to differentiate visually, the Washington State Department of Fish and Wildlife (WDFW) manages the two species together as “native char.” Bull trout exhibit resident and migratory life-history strategies throughout much of their range. Resident bull trout complete their life cycles in the tributary (or nearby) streams in which they spawn and rear. Migratory bull trout spawn in tributary streams where juvenile fish rear from one to four years before migrating to either a lake, river, or to saltwater (in certain coastal areas) to mature. Water bodies must have specific physical characteristics to provide habitat requirements for bull trout to successfully spawn and rear. Bull trout primarily favor colder streams. Water temperatures above 15 degrees Celsius (59 degrees Fahrenheit) are believed to limit bull trout distribution.

On February 22, 2001, the EPA and the Services published a final notice of a Memorandum of Agreement (MOA)<sup>16</sup> between the three agencies that addresses coordination under the CWA and the ESA. The MOA prescribes regional coordination review teams to ensure interagency coordination. The MOA sets up a process for elevating issues that cannot be resolved at the regional level. The MOA encourages the agencies to integrate more effectively national level activities such as water quality standards (WQS) rulemakings. The MOA provides for communication and consultation

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<sup>14</sup> WSDOT, 2002.

<sup>15</sup> <http://www.nwr.noaa.gov/ESA-Salmon-Listings/upload/snapshot0607.pdf>

<sup>16</sup> *Federal Register*, Volume 66, Number 36.

between EPA and the Services regarding both state and tribal WQS. Finally, the MOA establishes a structure for the EPA and the Services to coordinate on actions related to the issuance of NPDES permits.

On September 2, 2005, the NMFS published (50 CFR 226) the rules (effective January 2, 2006) designating critical habitat for Pacific salmon and steelhead in Washington, Oregon, Idaho, and California. This designation included the Puget Sound evolutionary significant unit (ESU) of Chinook salmon. Critical habitat is designated for areas containing the physical and biological habitat features, or primary constituent elements (PCEs), essential for conservation of the species or which require special management considerations. PCEs include sites that are essential to support of one or more life stages of the ESU and which contain physical or biological features essential to conserve the ESU. No portion of the project aquatic resources study area has been designated as critical habitat for Chinook salmon.

On September 26, 2005, the USFWS published (70 Federal Register 56212) the final rule (effective October 26, 2005) designating critical habitat for the Coastal-Puget Sound population of bull trout. For an area to be included as critical habitat, it must provide one or more of the following functions for bull trout: spawning, rearing, foraging, or over-wintering habitat to support essential existing bull trout local populations; movement corridors necessary for maintaining essential migratory life history forms; or suitable habitat that is considered essential for recovering existing local populations that have declined or that need to be re-established to achieve recovery. The documented critical habitat in WRIA 8 includes Lake Washington and associated tributaries of the lake, the Cedar River from Boulder Creek upstream to Chester Morse Lake, the Sammamish River, Lake Union, and the Ship Canal.

On June 11, 2007, NMFS listed the Puget Sound steelhead as a threatened species.<sup>17</sup>

Additionally, local regulations, ordinances, and policies provide for the protection of aquatic resources through shoreline management and sensitive/critical areas requirements.

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<sup>17</sup> <http://www.nwr.noaa.gov/ESA-Salmon-Listings/upload/snapshot0607.pdf>

## EXISTING CONDITIONS

The study areas described and referenced in the following subsections for air quality, surface waters, wetlands, and aquatic resources are those utilized by the respective discipline report authors in evaluating the effects of the I-405, NE 8th Street to SR 520 Improvement Project. The geographic boundaries for the CEA are described in Appendix A, Methodology.

### AIR QUALITY

The *Air Quality Discipline Report*<sup>18</sup> evaluated the localized effects on air quality that could occur within the project limits during construction and operation of the I-405, NE 8th Street to SR 520 Improvement Project.

#### ***Air Quality in Central Puget Sound Region since 1960***

Air quality in the Central Puget Sound Region has varied 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 O<sub>3</sub>. The degradation was largely a result of the rise in vehicle travel associated with increasing population and urbanization.

Air quality improved over the next two decades due to technological improvements in emissions control equipment and more stringent regulations. This improvement enabled the EPA to designate the region as a “maintenance area” for CO and O<sub>3</sub> 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 vehicle travel grew by approximately 200 percent. The O<sub>3</sub> maintenance area designation was dropped on June 15, 2005, because the region was in attainment for the new 8-hour O<sub>3</sub> standard and the 1-hour standard was revoked.

Because travel demand has exceeded the capacity of the roadway and transit network, congestion continues to worsen on all highways, including I-405. Transportation improvements such as the I-405, NE 8th Street to SR 520 Improvement Project will help decrease congestion and emissions.

While motor vehicle emissions are expected to decline in the future due to new regulations and technologies, growth in vehicle travel will eventually result in an overall increase in emissions.<sup>19</sup>

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<sup>18</sup> WSDOT, 2008a.

<sup>19</sup> PSRC, 2004.

### **Existing Air Quality in the Project Study Area**

Concentrations of the monitored air pollutants have been below the NAAQS for the last several years in the Seattle-Bellevue area. Although the O<sub>3</sub> concentration in 2004 reached the standard at a monitor in Lake Sammamish State Park, the standard has not been exceeded. Existing CO concentrations in the I-405, NE 8th Street to SR 520 Improvement Project study area do not exceed NAAQS. Additional details are available in the *Air Quality Discipline Report*.<sup>20</sup>

### **SURFACE WATERS**

The study area used for water quality in the *Water Resources Discipline Report*<sup>21</sup> is the area 300 feet upstream and one-quarter mile downstream from the right-of-way.

### **Quality of Surface Waters in the Project Study Area**

I-405 and SR 520 intersect and/or discharge stormwater runoff to the following primary perennial streams within the project study area (from south to north [I-405] and west to east [SR 520]):

- Sturtevant Creek
- Yarrow Creek
- West Tributary to Kelsey Creek
- Goff Creek
- Valley Creek

Exhibit 2 shows the location of these water bodies and their associated drainage basins. The surface waters are located within the urbanized and suburban areas of King County and have been extensively modified as a result of development.

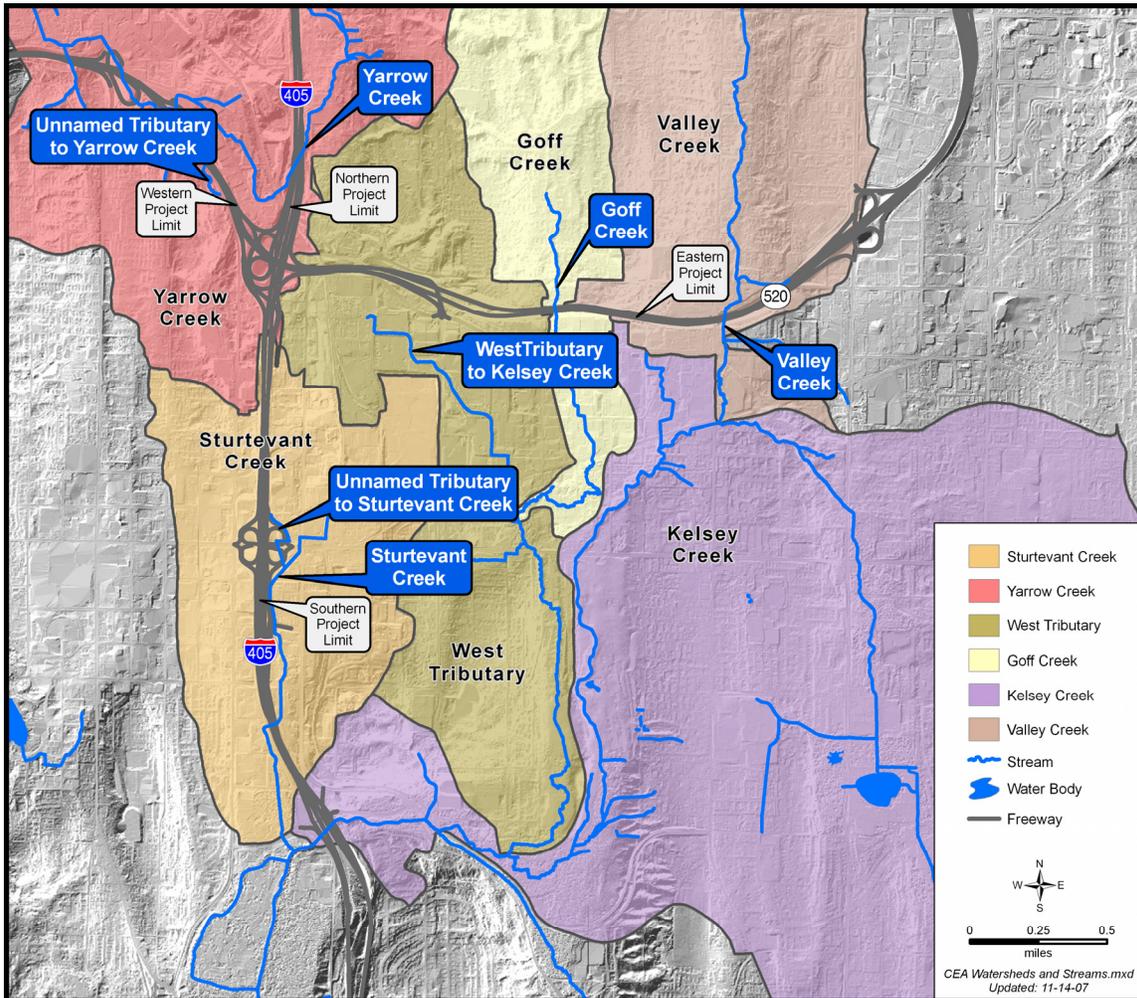
In addition to the West Tributary to Kelsey Creek, Goff Creek and Valley Creek are also tributaries of Kelsey Creek. Kelsey Creek is outside (downstream) of the project study area and does not meet water quality standards for temperature, dissolved oxygen, and fecal coliform. Water bodies that are water quality limited do not meet state water quality standards for one or more parameters, and technology-based controls are not sufficient to achieve water quality standards. The State maintains a 303(d) list to prioritize water bodies for protection. A water body on the 303(d) list is required to undergo a “total maximum daily load” (TMDL) study that leads to an allocation of the allowable input of the pollutants so that water quality standards can be achieved. None

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<sup>20</sup> WSDOT, 2008a.

<sup>21</sup> WSDOT, 2008b.

## Exhibit 2: Watersheds and Water Bodies in the Project Study Area



of the portions of the water bodies in the project study area are on Ecology's 303(d) list at this time. As a result, TMDL studies have not been conducted for any of the portions of the water bodies in the project study area.<sup>22</sup>

### ***Watersheds and Streams in the Project Study Area***

All of the water bodies within the project study area are part of water resource inventory area (WRIA) 8, Lake Washington/Cedar – Sammamish. The WRIA boundaries represent the administrative basis for Ecology's regulatory activities and were established by

<sup>22</sup> WSDOT, 2008b.

Ecology, the Washington Department of Natural Resources (WDNR), and the Washington Department of Fish and Wildlife (WDFW) in 1970.

Sturtevant Creek originates in Lake Bellevue at an elevation of 150 feet above MSL and flows approximately three-quarters of a mile through heavily developed commercial portions of the city of Bellevue and a flat vegetated area before entering Mercer Slough. Much of the stream, which drains an area of 773 acres, is contained in culverts. The basin is approximately 70 percent impervious.

Yarrow Creek originates in Bridle Trails State Park at an elevation of 420 feet above mean sea level (MSL) and flows about 3 miles westerly before entering Lake Washington. Much of the stream is channeled through pipes, although several straight sections of the creek flow in open channels between culverts. Land use in the Yarrow Creek basin (one square mile in size) includes recreational, commercial, and multi- and single-family residential development. The watershed is estimated to be approximately 30 percent impervious.

The West Tributary to Kelsey Creek basin (1000 acres in size) is one of four basins in the Kelsey Creek subarea. The West Tributary is the longest (about 3 miles) tributary to Kelsey Creek and originates southeast of the I-405/SR 520 interchange in a large wetland complex. Land use in the basin is residential, light industrial/commercial, open space/parks, and transportation corridors. The stream flows through a combination of ditches, open channels, culverts, and storm pipes southeast to its confluence with Kelsey Creek just south of SE 8th Street near Kelsey Creek Park. The basin is about 45 percent impervious.

Goff Creek, a tributary to the West Tributary to Kelsey Creek, is approximately 1.3 miles long, and has a 700-acre basin. Goff Creek originates in the southeastern section of Bridle Trails State Park. The basin is mostly residential, commercial, and transportation corridors, but is only 30 percent impervious because it includes a portion of Bridle Trails State Park. The stream flows generally south through a combination of open channels and culverts to where it empties into the West Tributary near Bel-Red Road.

Valley Creek is a tributary to the main branch of Kelsey Creek. The stream is approximately 2.7 miles long, originates near 140th Avenue NE at the Bellevue Municipal Golf Course, and drains a 1390-acre basin that is about 30 percent impervious. Land use in the basin is more than 50 percent single-family residential. Secondary uses include open spaces, parks, and commercial. The stream flows

generally south mostly in open, low-gradient channels to its confluence with Kelsey Creek.<sup>23</sup>

### ***Effect of Development on Surface Water Quality***

When natural landscapes are developed, the natural drainage processes can be radically altered. In a natural forested landscape, vegetation, forest duff, and the upper soil layers capture rain and slowly release the rainwater to groundwater, or release it as stream base flow. When impervious surfaces such as roofs, driveways, sidewalks, and streets replace the soils and vegetation, much less water soaks into the ground, decreasing groundwater recharge and stream base flows. Also, the increased impervious surface generates more stormwater, which runs off much more quickly and results in more erosion, sedimentation, and flooding.

Stormwater runoff in urban areas also carries more pollutants, including: sediment from erosion; oil and grease from roads and parking lots; metals from tires, brakes, and roofs; and pesticides, herbicides, and fertilizers from lawns and landscaping. Some of these pollutants dissolve in stormwater, but most become attached to small particles and thereby increase the cloudiness (turbidity) of the water. Vehicle traffic generates several types of pollutants. These include metals such as copper, zinc, and cadmium; oil and grease; turbidity from wearing tires and brakes; and dirt that is washed off vehicles.

All of these changes decrease the habitat value of streams due to the hydrologic effects and the reduced water quality. Nutrients in surface water, such as those from fertilizers, can lower the amount of dissolved oxygen available to aquatic life. Turbidity, copper, and zinc can harm fisheries and aquatic insects. Removing the particles that cause turbidity is the primary strategy of many stormwater treatment systems.<sup>24</sup>

### ***Stormwater Management***

By the 1970s, local municipalities recognized that stormwater management was needed for new developments. Local municipalities established stormwater utilities and implemented best management practices (BMPs) for controlling stormwater runoff. The Puget Sound Action Team published the *Puget Sound Water Quality Management Plan* in the late 1980s. In the early 1990s, King County issued the *Surface Water Design Manual*, WSDOT issued the *Highway Runoff Manual*, and Ecology issued the *Stormwater Management Manual for the Puget Sound Basin*. Stormwater detention and water quality treatment became mandatory for all projects. Statutes (for example, the CWA, GMA, and the Shoreline Management Act [SMA]) and their associated regulations provided

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<sup>23</sup> WSDOT, 2008b.

<sup>24</sup> WSDOT, 2008b.

additional guidance. Stormwater management requirements continue to evolve and are becoming more stringent.

### ***Stormwater Management in the Project Study Area***

Stormwater in the I-405, NE 8th Street to SR 520 Improvement Project study area is currently managed and treated using a variety of facilities. These facilities include wetponds, a biofiltration swale, and vaults. The majority of the stormwater runoff from roadways drains without detention or water quality treatment. Some of the systems have been in place for a long time and may not function as originally intended. Additional details can be found in the *Water Resources Discipline Report*.<sup>25</sup>

## **WETLANDS**

The wetlands study area used in the *Ecosystems Discipline Report*<sup>26</sup> is the area within 500 feet of and including the project footprint.

### ***Wetland Resource Trends***

Wetland resources in the WRIA 8 have declined over time because of the construction of homes, retail centers, industrial facilities, public infrastructure, and the loss of natural landscapes associated with population increases. While environmental awareness has increased through the passage of legislation, the number, size, and function of wetlands have declined. 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 further enhance the restoration trend.

### ***Wetlands in the Project Study Area***

- Location

Twelve wetlands, totaling approximately 7.3 acres, were identified within or adjacent to the project study area as shown in Exhibit 3. The Valley Creek basin contains two wetlands totaling approximately 1.1 acres, Goff Creek basin one wetland totaling about 0.04 acre, West Tributary to Kelsey Creek basin two wetlands totaling 4.3 acres, and the Yarrow Creek basin seven wetlands totaling 1.9 acres. No wetlands occur in the portion of the Sturtevant Creek basin that lies within the study area.

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<sup>25</sup> WSDOT, 2008b.

<sup>26</sup> WSDOT, 2007b.

- Classification

Using Ecology's rating system (adopted by the City of Bellevue), nine of the 12 wetlands that occur in the wetlands study area were classified as Category IV (lowest-value class of wetlands), two as Category III, and one as Category II. No Category I wetlands were identified in the study area.

- Function and Values

Eight of the 12 wetlands within the study area are less than 0.4 acre and two less than 0.1 acre. The two remaining wetlands are 0.7 acre and 4.1 acres in size.

Larger wetlands in the study area are typically located in flat, low-lying areas. Smaller wetlands are most often located in small, closed topographic depressions, or are hydrologically connected to hillside seeps or roadside drainage ditches. Because of their size and topography, larger wetlands are more likely to provide a higher number and higher value of beneficial functions than smaller wetlands.

The entire study area is located within the urban growth area, with most of the study area comprised of existing road rights-of-way. All the wetlands within the study area have been disturbed to some extent by development, including construction of I-405 and development in the surrounding area. This has affected the wetlands' ability to provide beneficial functions.

All of the wetlands in the study area have, to varying degrees, the potential to provide valuable stormwater management functions, including flood flow alteration, sediment removal, nutrient and toxicant removal, and erosion control. Six of the 12 wetlands have a moderate potential to provide value related to general habitat, habitat for amphibians, wetland-associated mammals and/or wetland-associated birds, or native plant richness. Six of the wetlands have a low potential to provide habitat for many species. None of the wetlands has a high (numerous types of vegetation, water levels that vary, and an irregularly shaped edge) functional score for the potential to provide habitat.<sup>27</sup>

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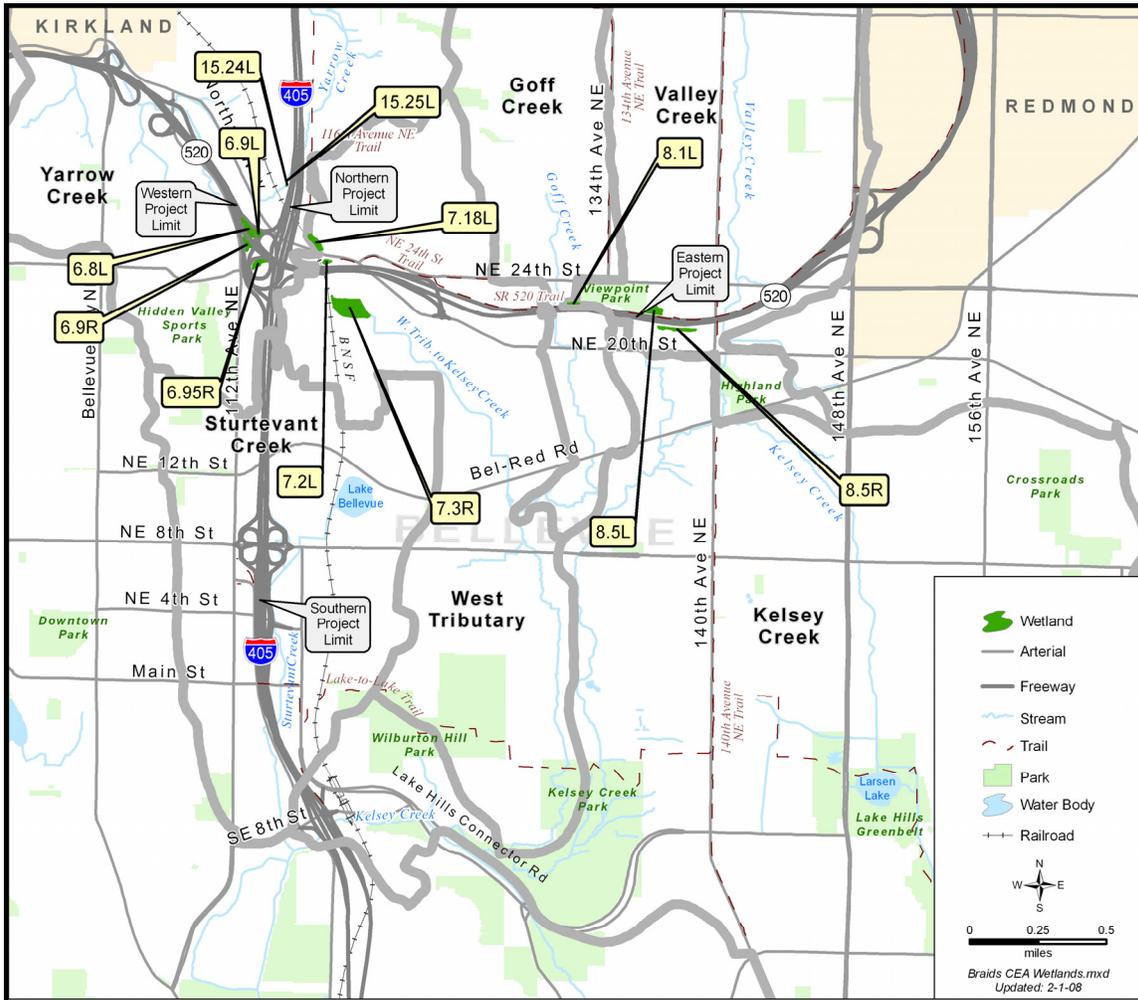
**Ecology bases its categories on function as follows:**

- **I – Provide a high level of functions.**
  - **II – Provide a high level of some functions.**
  - **III – Provide a moderate level of functions.**
  - **IV – Provide a low level of functions.**
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<sup>27</sup> WSDOT, 2007b.

**Exhibit 3: Wetlands in the Project Study Area<sup>28</sup>**



**AQUATIC RESOURCES**

The aquatic resources study area used in the *Ecosystems Discipline Report*<sup>29</sup> includes all streams that either flow within or have a hydrologic connection to any wetland within the wetland study area, or are in close proximity to the wetland study area and may be affected as a result of the project.

<sup>28</sup> Wetland designations include the milepost of the location along the roadway followed by an L (west or north of the roadway) or an R (east or south of the roadway). Example: 8.5L along SR 520 is located at milepost 8.5 on the north side of the roadway.

<sup>29</sup> WSDOT, 2007b.

## **Aquatic Resource Trends**

Although fish populations fluctuate naturally, in general, their numbers have markedly declined and the extent and quality of their habitat has decreased over the past century. As the human population and the extent of development 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 riparian/streamside vegetation, channel modification, bank armoring, dredging, removal of woody debris from streams, routing of streams through culverts, and alteration of natural stream flow regimes.

The Washington State Salmonid Stock Inventory identifies five salmonid stocks within the I-405 Corridor Program area as “depressed”: Cedar River sockeye (*O. nerka*), Lake Washington beach sockeye, Lake Washington/Sammamish tributary sockeye, Lake Washington/Sammamish tributary coho, and Lake Washington winter steelhead (*O. mykiss*). 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.” Escapement (number of fish that survive natural and human-caused mortality to spawn) for each of these stocks has been on a declining trend. Any cumulative adverse effect from the I-405 Corridor Program project could contribute to the continuance of such a declining trend.<sup>30</sup>

As noted previously, declining populations have led to the listing of Puget Sound Chinook salmon, Puget Sound steelhead, and bull trout as “threatened” under the ESA.

## **Characteristics of Aquatic Habitat in the Project Study Area**

Aquatic habitat includes the physical, chemical, and biological components of the environment that support fish throughout their life cycle. These components include water quality, stream flows, physical features, and ecosystem interactions related to the habitat.

Over time, the river and streams in the project study area have been highly altered from their natural states to accommodate residential, commercial, and industrial land uses. This alteration has included bank hardening, such as installing riprap and placing streams in culverts and pipes; reducing or removing riparian/streamside vegetation; straightening stream channels; and removing in-stream habitat. These alterations have resulted in the loss of historic floodplains associated with most of the water bodies. Substantial changes have also occurred in the vegetation surrounding the water bodies; what was once predominantly mature native vegetation has been replaced by a mix of immature native vegetation and non-native invasive plant species.

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<sup>30</sup> WSDOT, 2002.

### **Fish Species in the Project Study Area**

Many fish and other aquatic species inhabit the streams and wetlands in the project study area. Fish species found in the area include both anadromous and resident salmonids and a variety of other resident fish. Anadromous salmonids found in the study area include Chinook, coho, and sea-run cutthroat trout (*O. clarki clarki*).

Anadromous salmonid species primarily use the streams in the study area for upstream and downstream migration and rearing. The study area also contains limited spawning habitat for Chinook and coho. Resident cutthroat trout (*O. clarki*) use the study area for all life stages.

Other fish species likely to be found in the study area include three-spine stickleback (*Gasterosteus aculeatus*), longnose dace (*Rhinichthys cataractae*), speckled dace (*R. osculus*), rickly sculpin (*Cottus asper*), riffle sculpin (*C. gulosus*), reticulated sculpin (*C. perplexus*), shorthead sculpin (*C. confusus*), torrent sculpin (*C. rhotheus*), largescale sucker (*Catostomus macrocheilus*), Pacific lamprey (*Lampetra tridentate*), river lamprey (*L. ayresi*), and western brook lamprey (*L. richardsoni*).

Other native species found in the study area include crayfish, frogs, and salamanders; and freshwater clams and mussels.<sup>31</sup>

Additional details regarding the presence of fish in the project study area can be found in the *Ecosystems Discipline Report*.<sup>32</sup>

### **Listed Species and Species of Concern in the Project Study Area**

Valley Creek contains various life stages of Chinook salmon which is currently listed as threatened under the ESA. The Chinook found in this stream are a part of the Puget Sound ESU of Chinook salmon.<sup>33</sup> In addition, coho salmon and river lamprey, species of concern, are also found in some streams in the study area. No water bodies in the study area have documented occurrences of any life stages of bull trout.

Priority fisheries and aquatic species include all state endangered, threatened, sensitive, or candidate species, and species of recreational, commercial, or tribal importance that are considered vulnerable. All fish species with state candidate status that occur in the study area also hold a federal designation and have been discussed. No other state sensitive, threatened, or endangered fish species occur within the study area. Other fish

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<sup>31</sup> Wydoski and Whitney, 2003.

<sup>32</sup> WSDOT, 2007b.

<sup>33</sup> NMFS, 1998, 1999.

species that are designated as priority species that may occur in the project study area include coastal cutthroat trout and river lamprey.<sup>34</sup>

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<sup>34</sup> WSDOT, 2007b.

## POTENTIAL EFFECTS

### AIR QUALITY

#### **Construction**

- Direct

The I-405, NE 8th Street to SR 520 Improvement Project is expected to produce temporary effects on air quality that are characteristic of the construction of large roadway projects. These effects could include: (a) increases in particulate emissions depending on the level and type of activity, soil characteristics, weather, and equipment employed; (b) CO and oxides of nitrogen in the exhaust of construction equipment powered by gasoline and diesel engines; (c) increases in the levels of CO and oxides of nitrogen emitted from vehicles that are delayed while transiting through the work areas; and (d) odors associated with the use of asphalt. These effects are expected to be localized and minor.

- Indirect

No indirect effects associated with air quality changes are anticipated from construction of the I-405, NE 8th Street to SR 520 Improvement Project because of the low level and short duration of the temporary direct effects.

- Cumulative

Construction-related cumulative effects on air quality resulting from the I-405, NE 8th Street to SR 520 Improvement Project and the other projects included in this CEA should be localized, temporary, and of low magnitude with mitigation measures in place. This is because of the distance between the projects and their respective schedules, duration, characteristics, and size.

#### **Operation**

- Direct

The I-405, NE 8th Street to SR 520 Improvement Project will not cause any NAAQS exceedences for CO, which indicates that it will meet EPA project-level and regional conformity requirements.<sup>35</sup>

- Indirect

No indirect effects associated with air quality changes are anticipated resulting from operation of the I-405, NE 8th Street to SR 520 Improvement Project.

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<sup>35</sup> WSDOT, 2008a.

- Cumulative

The I-405, NE 8th Street to SR 520 Improvement Project will provide new and reconfigured ramps and a new eastbound collector-distributor lane at the I-405/SR 520 interchange. As a result, congestion in these areas will be decreased and traffic flow improved. The project will not cause or contribute to violation of CO standards. These benefits will be realized through 2030.<sup>36</sup> The other HOV and transit projects included in this CEA may also help reduce automobile use, improve the transportation system's efficiency, and decrease existing CO levels in parts of the air quality study area. The operational phase of the Overlake Hospital Medical Center Expansion will not affect air quality. The various major development projects in Downtown Bellevue will likely increase traffic volumes and, as a result, may produce decreased levels of service at certain City intersections. The decreased levels of service at those intersections could lead to decreased air quality in the immediate area at peak travel times of the day.

### **No Build Alternative**

Improvements and enhancements associated with the I-405, NE 8th Street to SR 520 Improvement Project would not occur. The I-405, NE 8th Street to SR 520 Improvement Project would not produce any construction-related effects on air quality.

The No Build Alternative would not provide any relief to traffic congestion in the I-405, NE 8th Street to SR 520 Improvement Project air quality study area. The *Air Quality Discipline Report*<sup>37</sup> indicates that, although the No Build Alternative would not cause CO concentrations to exceed NAAQS, the CO levels would be higher than those for the Build Alternative.

Assuming the other projects considered in this CEA are constructed and placed in operation, the respective contributions to cumulative effects on air quality due to those projects would be as noted under the construction and operation cumulative effects discussions above.

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<sup>36</sup> WSDOT, 2008a.

<sup>37</sup> WSDOT, 2008a.

## **SURFACE WATERS**

### **Construction**

- Direct

The Build Alternative will be constructed in accordance with federal and state technical guidance, permit conditions, and WSDOT project specifications that will require the use of BMPs to control the rate of runoff and, where practical, retain runoff on the site. These effects will be localized, temporary, and of low magnitude should they occur.

Construction of the project will involve some dewatering. The dewatering water will be discharged to either the unnamed tributary or the main stem of Sturtevant Creek. The quality of the discharged water will meet the criteria established by the permits received for the project.

In-stream work will only occur in the unnamed tributary to Sturtevant Creek to allow for widening of the on-ramp from NE 8th Street to northbound I-405. Approximately 200 linear feet of stream channel and 6,640 square feet of stream buffer will be permanently affected. There will be no stream-crossing culvert replacements or extensions.<sup>38</sup>

- Indirect

A decrease in water quality could negatively affect fish and organisms living in the waters. The effects are anticipated to be localized, temporary, and of low magnitude if they occur.

- Cumulative

WSDOT will implement BMPs to minimize the I-405, NE 8th Street to SR 520 Improvement Project's contribution to adverse cumulative effects on surface waters, and will comply with all regulatory requirements and permit conditions (for example, the NPDES Construction Stormwater Permit conditions). Assuming that similar mitigation measures will be followed for the other projects considered in this CEA, adverse construction-related cumulative effects on surface waters should be temporary and of low magnitude.

### **Operation**

- Direct

The Build Alternative will add approximately 11.4 acres of new impervious surface to the existing 86 acres of impervious surface in the project study area. Highway runoff will be treated by applying quality and flow control BMPs in accordance with the WSDOT *Highway*

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<sup>38</sup> WSDOT, 2008b.

*Runoff Manual* so that stormwater discharges from the highway will meet the water quality and peak discharge criteria required by state and local authorities.<sup>39</sup>

WSDOT will control stormwater flow for the new impervious area by constructing six stormwater detention facilities: five combined stormwater detention and treatment wetlands (four new and one improved); one detention tank; and one detention ditch. These facilities, combined with 700 linear feet of ecology embankments, will provide water quality treatment for approximately 28 acres of impervious surface.

The Build Alternative will not substantially alter existing runoff patterns. Drainage from the stormwater facilities and the modified drainage system will continue to flow to existing outfalls to the streams and eventually to Lake Washington.

Water quality conditions in the surface water study area are expected to improve.

- Indirect

It is unlikely that indirect effects brought about by changes in surface flows and water quality will occur. Groundwater hydrology could be altered due to the increased impervious surface area. However, the increase in impervious surfaces should not substantially affect the total amount of recharge to the shallow aquifers in the vicinity of the project because the majority of recharge to these aquifers is from drainage areas beyond the project footprint. The areas within the project footprint where exposed aquifers would be covered by additional pavement represent a tiny fraction (0.008 acre) of the entire aquifer recharge area (1,468 acres).<sup>40</sup>

- Cumulative

The I-405, NE 8th Street to SR 520 Improvement Project will not have a negative effect on surface waters during operation. The I-405, SR 520 to I-5 Improvement Project, the SR 520 Bridge Replacement and HOV Project, and the I-405, South Bellevue Widening Project will improve water quality as a result of retrofitting some existing impervious surface areas with new water quality treatment facilities. The other projects included in this CEA will, at a minimum, be required to comply with surface water management requirements. To the extent those projects also provide enhanced and/or retrofitted treatment and/or reduced impervious area, improvements to surface water quality should result.

### **No Build Alternative**

The I-405, NE 8th Street to SR 520 Improvement Project would not produce any construction-related effects on surface waters and water quality under the No Build Alternative.

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<sup>39</sup> WSDOT, 2008b.

<sup>40</sup> WSDOT, 2008b.

Currently, some surface waters in the I-405, NE 8th Street to SR 520 Improvement Project study area receive runoff from stormwater facilities that do not meet current treatment level standards. To the degree that those surface waters are adversely affected by the existing water quality, those effects would likely continue.

Improvements and enhancements associated with the I-405, NE 8th Street to SR 520 Improvement Project would not occur.

Assuming the other projects considered in this CEA are constructed and placed in operation, the respective contributions to cumulative effects on surface waters due to those projects would be as noted under the construction and operation cumulative effects discussions above.

## **WETLANDS**

### **Construction**

- Direct

Construction will require work in and adjacent to the project study area. Of the 12 wetlands identified within the study area, only 0.3 acre of wetland, and 0.47 acre of wetland buffer, will be permanently filled. Additionally, approximately 0.05 acre of wetland and 0.07 acre of wetland buffers will be temporarily disturbed, resulting in a short-term reduction or loss of wetland functions. WSDOT will restore the temporarily affected wetlands and wetland buffers after construction is completed. Restoration will include replanting with appropriate vegetation. A project-specific restoration plan will guide those activities.<sup>41</sup> Compensatory mitigation for the permanently affected wetland and wetland buffer areas will occur at a site in Kelsey Creek Park.

- Indirect

Loss or reduction in a wetland's function and/or value can be an indirect effect of partially filling the wetland. The single wetland (0.39 acre) that will be partially filled (0.3 acre) is a Category IV emergent wetland. Filling a portion of a wetland or altering its vegetation can reduce the wetland's capacity to store stormwater, filter pollutants, protect stream banks from erosion, and provide wildlife habitat. The single wetland that will be permanently affected is dominated by invasive species and is surrounded by urban land uses including roads and buildings.<sup>42</sup> Thus, the reduction in function and value should not be substantial.

- Cumulative

Based on the mitigation that will occur to compensate for the loss of 0.3 acre of wetland, a positive contribution to cumulative effects to wetlands may be realized as a result of the

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<sup>41</sup> WSDOT, 2007b.

<sup>42</sup> WSDOT, 2007b.

construction of the I-405, NE 8th Street to SR 520 Improvement Project. More and higher quality wetland areas will be created and enhanced than will be filled. WSDOT plans to compensate for permanently affected wetlands by providing approximately 0.5 acre of wetland mitigation at a site in Kelsey Creek Park. The mitigation site has been created as part of the mitigation for the I-405, South Bellevue Widening Project. Typically, such sites provide high-quality wetlands and habitats.

Wetlands will also be affected by the SR 520 Bridge Replacement and HOV Project and the I-405, SR 520 to I-5 Improvement Project. These projects will also create or enhance more acres of wetlands than are filled or permanently affected. The SR 520 to I-5 Improvement Project will permanently fill less than 0.5 acre of wetland. The design options for the SR 520 Bridge Replacement and HOV Project are still being evaluated. Mitigation sites for these projects have not been finalized.

No wetlands will be affected either temporarily or permanently by the NE 10th Street Extension, Overlake Hospital Medical Center Project, or the various major projects in downtown Bellevue.

### **Operation**

- Direct

Some wetlands that exist within the right-of-way are currently affected by vegetation and stormwater conveyance system maintenance activities. It is likely that wetland areas remaining within the right-of-way after construction of the project will continue to be affected by such maintenance activities. Stormwater management measures provided by the project will help to minimize adverse water quality-related effects on wetlands within the right-of-way or those receiving stormwater discharges from the new impervious surfaces.

- Indirect

Only very minor indirect effects are anticipated due to operation of the I-405, NE 8th Street to SR 520 Improvement Project because the direct effects to wetlands will be minor.

- Cumulative

Compensatory mitigation sites will provide high-quality wetlands and habitats. Other projects considered in this CEA that mitigate appropriately could also positively affect wetlands. Operation of the 520 Bridge Replacement and HOV Project, the I-405, South Bellevue Widening Project and the I-405, SR 520 to I-5 Improvement Project may result in positive cumulative effects to wetlands receiving runoff as a result of the projects retrofitting water quality treatment for some existing impervious surfaces, as well as enhanced treatment of discharges from the new impervious surfaces.

## **No Build Alternative**

No construction would occur for the No Build Alternative; therefore, no wetlands or wetland buffers would be affected by the I-405, NE 8th Street to SR 520 Improvement Project. Some wetlands in the wetland study area currently receive untreated runoff from stormwater facilities that do not meet current treatment levels. If those wetlands are adversely affected by the existing water quality, those effects would likely continue. Similarly, improvements and enhancements associated with the I-405, NE 8th Street to SR 520 Improvement Project would not occur.

Assuming the other projects considered in this CEA are constructed and placed in operation, the respective contributions to cumulative effects on wetlands due to those projects would be as noted under the construction and operation cumulative effects discussions above.

## **AQUATIC RESOURCES**

### **Construction**

- Direct

The I-405, NE 8th Street to SR 520 Improvement Project is designed to avoid temporary and permanent effects below the OHWM and within regulated buffers to the streams in the study area. One exception exists. In-stream work will occur in the unnamed tributary to Sturtevant Creek to allow for widening of the on-ramp from NE 8th Street to northbound I-405. Approximately 200 linear feet of stream channel and 6,640 square feet of stream buffer will be permanently affected. Anadromous fish are not anticipated to use the portion of Sturtevant Creek and the tributary in the study area because of the existence of a downstream impassable fish barrier.<sup>43</sup>

There is also some potential for fine sediments to be released into the streams in the study area during construction. However, use of BMPs will minimize the potential and the resulting effects, should they occur.

- Indirect

Indirect effects, resulting from direct construction effects on fish and changes to aquatic habitat, are not anticipated. This is primarily due to the degraded condition of the existing environment and the use of avoidance measures and BMPs to minimize direct effects during construction.

- Cumulative

Some losses and degradation of aquatic habitat and temporary short-term decreases in water quality could occur due to construction of the I-405, NE 8th Street to SR 520 Improvement

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<sup>43</sup> WSDOT, 2007b.

Project; the I-405, SR 520 to I-5 Improvement Project; the I-405, South Bellevue Widening Project; and the SR 520 Bridge Replacement and HOV Project. The 520 Bridge Replacement and HOV Project, in particular, will involve substantial in-water work. These construction effects (such as, loss of riparian vegetation, temporary increased sedimentation, changes in the stream flows, and stream course modifications) will be minimized through the use of BMPs, compliance with permit conditions and in-water work windows set by the fish and wildlife agencies, and by including avoidance measures in the project design.

Mitigation for the unnamed tributary to Sturtevant Creek affected by the Improvement Project will occur at Sturtevant Creek and be designed to meet certain goals. The goals will be achieved by installing large woody debris structures and other in-stream channel enhancements. Portions of the stream's buffer will be replanted with native species, invasive vegetation will be removed, and maintenance procedures implemented.

Construction of the other projects considered in this CEA is not expected to affect fish and aquatic habitat.

### **Operation**

- Direct

Proper maintenance and operation of the I-405, NE 8th Street to SR 520 Improvement Project's stormwater treatment facilities will help prevent a decline in water quality and its potential negative effects (sedimentation, metal contaminants, etc.) on aquatic resources.

- Indirect

Improved general ecosystem health is a potential indirect effect associated with the direct effects on aquatic resources resulting from operation of the project. This change would be the result of maintained water quality and improved riparian vegetation.

- Cumulative

Proper maintenance and continued operation of the I-405, NE 8th Street to SR 520 Improvement Project's stormwater treatment facilities and culverts, when combined with those associated with the I-405, SR 520 to I-5 Improvement; I-405, South Bellevue Widening; and SR 520 Bridge Replacement and HOV Projects, should result in a positive cumulative effect on aquatic resources. Additionally, proper maintenance of the improvements provided by compensatory mitigation sites will maintain their positive cumulative effects on aquatic resources as well.

### **No Build Alternative**

For the No Build Alternative, no construction would occur and, thus, no aquatic resources would be affected by construction activities associated with the I-405, NE 8th Street to SR 520 Improvement Project. At the present time, some surface waters in the project study area receive

untreated runoff from stormwater facilities that do not meet current treatment level standards. To the degree that those surface waters are adversely affected by the existing water quality, those effects would likely continue and could translate to negative effects on aquatic resources. Improvements to riparian vegetation would not occur.

Assuming the other projects considered in this CEA are constructed and placed in operation, the cumulative effects on aquatic resources due to those projects would be as noted under the construction and operation cumulative effects discussions above.

## **MEASURES TO AVOID OR MINIMIZE ADVERSE CUMULATIVE EFFECTS**

No measures, beyond those incorporated in the project design or listed in the air quality, water resources, and ecosystems discipline reports, would be necessary during construction and operation of the I-405, NE 8th Street to SR 520 Improvement Project to avoid or minimize adverse cumulative effects.

## **UNAVOIDABLE ADVERSE CUMULATIVE EFFECTS**

No unavoidable adverse cumulative effects are anticipated due to the construction and operation of the I-405, NE 8th Street to SR 520 Improvement Project.

## ACRONYMS AND ABBREVIATIONS

Term	Meaning
AQMP	air quality maintenance plan
BA	biological assessment
BMP	best management practice
CAA	Clean Air Act
CAWA	Clean Air Washington Act
CE	categorical exclusion
CEA	cumulative effects analysis
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
CWA	Clean Water Act
CWPP	County-wide Planning Policies
DO	dissolved oxygen
DOT	U.S. Department of Transportation
Eastside	east side of Lake Washington
Ecology	Washington State Department of Ecology
EFH	essential fish habitat
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESU	evolutionarily significant unit
FHWA	Federal Highway Administration
GMA	Washington State Growth Management Act
HCT	high-capacity transportation
HOV	high-occupancy vehicle
I	Interstate
LOS	level of service

Term	Meaning
MOA	memorandum of agreement
MP	mile post
MSL	mean sea level
MTP	Metropolitan Transportation Plan
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NO <sub>2</sub>	nitrogen dioxide
NPDES	National Pollutant Discharge Elimination System
O <sub>3</sub>	ozone
OHWM	ordinary high water mark
PCE	primary constituent element
PFMC	Pacific Fishery Management Council
PM	particulate matter
PM <sub>2.5</sub>	particulate matter less than 2.5 micrometers in size
PM <sub>10</sub>	particulate matter less than 10 micrometers in size
PS Clean Air	Puget Sound Clean Air Agency
PSRC	Puget Sound Regional Council
RCW	Revised Code of Washington
SEPA	Washington State Environmental Policy Act
Services	National Marine Fisheries Service and U.S. Fish and Wildlife Service
SIP	State Implementation Plan
SMA	Washington State Shoreline Management Act
SO <sub>2</sub>	sulfur dioxide
Sound Transit	Central Puget Sound Regional Transit Authority
SOV	single-occupant vehicle
SR	state route
TCM	transportation control measure
TEA	Transportation Equity Act

<b>Term</b>	<b>Meaning</b>
TEA-21	Transportation Equity Act for the 21st Century
TMDL	total maximum daily load
UGA	urban growth area
USC	U.S. Code
USFWS	U.S. Fish and Wildlife Service
VMT	vehicle miles traveled
WAC	Washington Administrative Code
WDFW	Washington State Department of Fish and Wildlife
WDNR	Washington State Department of Natural Resources
WQS	water quality standard
WRIA	water resource inventory area
WSDOT	Washington State Department of Transportation

## GLOSSARY

Term	Meaning
access	The ability to enter a freeway or roadway via an on-ramp or other entry point.
adaptive management	An approach that seeks to improve management of biological resources, particularly in areas of scientific uncertainty, by viewing actions as opportunities for learning. Projects are designed and implemented to provide useful information for future actions. Monitoring and evaluation are emphasized so that the interactions of different elements of the system are better understood. Actions are then adjusted, if needed, to achieve the desired results.
air emissions	Pollutants emitted into the air, such as: carbon monoxide, nitrogen oxide, nitrogen dioxide, sulfur dioxide, and others.
air pollutant	Any substance in air that could, in high enough concentration, harm people, animals, vegetation, or materials. They may be in the form of solid particles, liquid droplets, gases, or a combination thereof. Generally, they fall into two main groups: (1) those emitted directly from identifiable sources and (2) those produced in the air by interaction between two or more primary pollutants, or by reaction with normal atmospheric elements.
air quality standards	The level of pollutants prescribed by regulations that may not be exceeded during a given time in a defined area.
amphibians	A group of vertebrate animals that spend part of their time on land and part in the water. Amphibians must return to the water to breed and they have distinct larval and adult forms.

<b>Term</b>	<b>Meaning</b>
anadromous fish	A fish species that spends a part of its life cycle in the sea and returns to freshwater streams to reproduce (for example, salmon, steelhead, and trout).
aquifer	A geological stratum of saturated materials with the capability to yield useable quantities of groundwater on a long-term, sustainable basis.
arterial	A major street that primarily serves through-traffic, but also provides access to abutting properties. Arterials are often divided into principal and minor classifications depending on the number of lanes, connections made, volume of traffic, nature of traffic, speeds, interruptions (access functions), and length.
attainment area	An area considered to have air quality as good as or better than the National Ambient Air Quality Standards (NAAQS) for the criteria pollutants designated in the Clean Air Act. An area may be an attainment area for one pollutant and a non-attainment area for others.
auxiliary lane	A lane added between interchanges—from one on-ramp to the next off-ramp. It is dedicated to traffic entering and leaving a freeway and provides motorists with more time and extra room to accelerate or decelerate and merge when getting on and off the freeway.
bank	The slope of land adjoining a body of water, such as a river, lake, wetland or drainage channel. With respect to flowing waters, banks are either right or left as viewed facing in the direction of the flow.
basin	An area of land that drains to a specific water body.
best management practice (BMP)	Innovative and improved environmental protection tools, practices, and methods that have been determined to be the most effective, practical means of avoiding or reducing environmental impacts.

Term	Meaning
biofiltration swale	Long, broad, shallow grassy channels that are designed so that stormwater flows slowly through the facility. This allows the vegetation and soil matrix to filter and absorb pollutants from the stormwater runoff.
biological filtration	Biological processes in stormwater treatment facilities that remove pollutants from runoff.
buffer (aquatic resource)	A designated area along and adjacent to a stream or wetland that may be regulated to control the negative effects of adjacent development on the aquatic resource.
capacity	The maximum sustained traffic flow of a transportation facility under prevailing traffic and roadway conditions in a specified direction.
carbon monoxide (CO)	A colorless, odorless, toxic gas produced by incomplete combustion.
categorical exclusion (CE)	A category of actions that do not individually or cumulatively have a substantial effect on the environment and for which neither an environmental assessment nor environmental impact statement is required under the National Environmental Policy Act.
Code of Federal Regulations (CFR)	The arrangement of the general and permanent rules published by the executive departments and agencies of the Federal government. It is divided into 50 titles that represent broad areas subject to federal regulation. Each volume of the CFR is updated once each calendar year.
comprehensive plan	A municipal plan that provides policy and guidance on physical development and redevelopment. It addresses a range of issues: land use; economic development; housing; environmental protection; transportation; public facilities; urban design; and historic preservation. It also guides zoning laws, which in turn affect the types of uses allowed in specific areas, the amount of parking that must be provided, and other development requirements or restrictions.

<b>Term</b>	<b>Meaning</b>
concurrency	A provision of the Growth Management Act requiring that if a development will cause the level of service on a locally owned transportation facility to decline below the adopted standards, then the necessary transportation improvements must be provided at the time development occurs or a financial commitment must be in place to complete the improvements or strategies within six years. Otherwise, the local government is required to deny the permit application.
confluence	The convergence of two streams of comparable size into a single channel, or the junction where two rivers, streams, etc. flow together.
congestion	The condition when unstable traffic flows constrain travel speeds to less than the posted limit. Recurring congestion is caused by constant excess traffic volume compared with the highway's capacity. Nonrecurring congestion is caused by unusual or unpredictable events such as traffic accidents.
conservation	As defined by the Endangered Species Act (ESA), the use of all methods and procedures that are necessary to bring any endangered or threatened species to the point at which the measures provided pursuant to the ESA are no longer necessary.
Council on Environmental Quality (CEQ)	The federal agency charged with implementing the National Environmental Policy Act.
criteria pollutants	The six pollutants for which the Environmental Protection Agency has identified and set standards to protect human health under the Clean Air Act: ozone, carbon monoxide, total suspended particulates, sulfur dioxide, lead, and nitrogen oxide.

Term	Meaning
critical areas	These include aquifer recharge areas, fish and wildlife habitat conservation areas, flood hazard areas, geologic hazard areas, and wetlands. Critical area functions and values are protected by ordinances that require development to avoid or compensate for adverse effects on critical areas.
critical habitat	Under the Endangered Species Act, (1) the specific areas within the geographic area occupied by a federally-listed species on which are found physical or biological features essential to conserving the species, and that may require special protection or management considerations; and (2) specific areas outside the geographic area occupied by a federally-listed species when it is determined that such areas are essential for the conservation of the species.
cumulative effect	The effect on the environment that results from the incremental effect of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such actions. Cumulative effects can result from individually minor but collectively noticeable actions taking place over a period of time.
delay	The increased travel time experienced because of circumstances that impede the desirable movement of traffic.
demand	The desire for travel by potential users of the transportation system.
detention	The temporary storage of stormwater runoff in a stormwater facility to control the discharge rates.
detention pond	A surface catchment designed to reduce effects on stormwater runoff quality and/or quantity impacts by storing the increased runoff volume that results from development, then slowly releasing it at controlled runoff rates. Detention tanks and vaults are underground structures used to reduce peak stormwater flows.

<b>Term</b>	<b>Meaning</b>
direct effect	An effect caused by an action or alternative and occurring at the same time and location. Effects may be ecological, aesthetic, historic, cultural, economic, social, or health-related.
downstream	Referring to the direction of the flow of a stream or river.
drainage ditch	An open channel designed and constructed to convey water. This may include modifications of natural drainages or manmade historic channels incorporated in a system design.
ecology embankment	A stormwater treatment facility constructed in the pervious shoulder area of a highway to provide water quality treatment for highway runoff. It consists of a trench that is dug along side the highway shoulder, lain with perforated pipe, and backfilled with a filtration media. Water from the road flows off the roadway, is filtered by the media, and carried off site by the pipe.
ecosystem	A community of organisms interacting with each other, and the environment in which they live.
effect	Something brought about by a cause or agent; a result. This may include ecological, aesthetic, historic, cultural, economic, social, health, or other effects, whether direct, indirect, or cumulative. Effects may include those resulting from actions that may have both beneficial and detrimental effects.
emission	Pollution discharged into the atmosphere from smokestacks, other vents, surface, vehicles, and other sources.
endangered species	Any species that is in danger of extinction throughout all or a substantial portion of its range.
Endangered Species Act (ESA)	Federal legislation adopted to prevent the extinction of plants and animals.

Term	Meaning
environmental impact statement (EIS)	A document prepared under the National Environmental Policy Act and/or the State Environmental Policy Act that identifies and analyzes, in detail, environmental effects of a proposed action. As a tool for decision-making, the EIS describes positive and negative effects and examines reasonable alternatives for an undertaking.
escapement	The number of adult fish that enter a fresh water system to spawn.
evolutionarily significant unit (ESU)	The term used by the National Marine Fisheries Service for a fish species population protected by a listing under the Endangered Species Act.
express toll lane	A limited-access freeway lane that is actively managed through a variable toll system to regulate its use and thereby maintain express travel speeds and reliability. Toll prices rise or fall in real time as the lane approaches capacity or becomes less used. This ensures that traffic in the express toll lane remains flowing at express travel speeds of 45 to 60 miles per hour. Toll prices may differ for carpools, transit, motorcycles, and single-occupant vehicles. Tolls for are collected electronically using overhead scanners that read a transponder inside the vehicle and automatically debit the operator's account.
Federal Highway Administration (FHWA)	One of several agencies in the U.S. Department of Transportation, the FHWA provides federal financial assistance to the states through the Federal Aid Highway Program, the purpose of which is to construct and improve the National Highway System, urban and rural roads, and bridges.
federally-listed species	Any species of fish, wildlife, or plant that has been determined by the U.S. Fish and Wildlife Service or National Marine Fisheries Service to be endangered or threatened under Section 4 of the Endangered Species Act.

Term	Meaning
floodplain	Any land area susceptible to being inundated by flood waters from any source. This is typically the flat or nearly flat land on the bottom of a stream valley or tidal area that is covered by water during floods, including the flood fringe and floodway.
floodway	The channel of the river or stream, and those portions of the adjoining floodplains that have been designated as reasonably required to carry and discharge the base flood flow without resulting in a backwater that exceeds flood hazard regulations.
general-purpose lane	A freeway or arterial lane available for use by all traffic.
gradient	A measure of how steep a slope is. A slope with a gradient of ten percent rises (or declines) one foot for every ten feet of horizontal length.
groundwater	That portion of the water below the ground surface that is free flowing within the soil particles. Groundwater typically moves slowly, generally at a downward angle because of gravity, and eventually enters into streams, lakes, and oceans.
groundwater recharge	The process where natural sources (infiltrating rain, snowmelt or surface water) or pumped water enters and replenishes the groundwater supply.
Growth Management Act (GMA)	Washington State legislation adopted in 1990, and subsequently amended that requires all cities and counties in the state to do some long-range comprehensive planning. GMA has more extensive requirements for the largest and fastest-growing counties and cities in the state. Such comprehensive plans must address several required topics, including but not limited to land use, transportation, capital facilities, utilities, housing, etc. The GMA requirements also include guaranteeing the consistency of transportation and capital facilities plans with land use plans.
habitat	The environment or specific surroundings where a plant or animal grows or lives.

Term	Meaning
high-capacity transportation (HCT)	A system of public transportation services and facilities that provides a substantially higher level of passenger capacity, speed, and service frequency than traditional public transportation systems operating principally on general-purpose roadways. Examples include express buses on HOV lanes, passenger ferry service, light and heavy rail systems, and bus rapid transit.
high-occupancy vehicle (HOV)	High-occupancy vehicle is a special designation for a bus, carpool, or vanpool provided as an encouragement to increase ride-sharing. Specially designated HOV lanes and parking are among the incentives for persons to pool trips, use fewer vehicles, and make the transportation system more efficient. HOV lanes are generally inside (left-side) lanes, and are identified by signs and a diamond on the pavement. Currently, two or more (2+) occupants are required to use the I-405 HOV lanes. Motorcycles are allowed to use freeway HOV lanes as well.
Highways of Statewide Significance	Highways of statewide significance include, at a minimum, interstate highways and other principal arterials that are needed to connect major communities in the state.
hydrocarbons (HC)	Organic chemicals that contain hydrogen and carbon.
hydrology	Within the context of a wetland, permanent or periodic inundation or prolonged soil saturation sufficient to create anaerobic conditions in the soil.
impervious surface	Pavement, roofs, and other compacted or hardened areas that do not allow the passage of rainfall or runoff into the ground.

Term	Meaning
indirect effect	An effect that occurs later in time or is removed in distance from the proposed action, but is still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems.
invasive species	Non-native species that disrupt and displace native species.
jurisdiction	A municipal government agency, such as a city or county, and as appropriate, federal and state agencies and federally recognized tribes. The term also can mean "to have authority over."
land use	The type of activity (i.e., residential, commercial, or industrial) that occurs on property.
level of service (LOS)	A measure of how well a freeway or local signalized intersection operates. For freeways, LOS is a measure of traffic congestion typically based on volume-to-capacity ratios. For local intersections, LOS is based on how long it takes a typical vehicle to clear the intersection. Other criteria also may be used to gauge the operating performance of transit, non-motorized, and other transportation modes.
listed species	Any species of fish, wildlife, or plant that has been determined to be endangered or threatened. See also: "federally-listed species" and "state-listed species".
maintenance area	Area that has met the National Ambient Air Quality Standards (NAAQS) for the criteria pollutants designated in the Clean Air Act and is being managed to continue to meet the NAAQS.
Metropolitan Transportation Plan (MTP)	The detailed long-range plan for future investments in the central Puget Sound region's regional transportation system. For planning purposes, the MTP also is recognized as the central Puget Sound region's Regional Transportation Plan.

<b>Term</b>	<b>Meaning</b>
mitigation	An effort to: (1) avoid the affect altogether by not taking a certain action or parts of an action; (2) minimize the affect by limiting the magnitude of the action and its implementation, by using technology or by taking affirmative steps; (3) rectify the affect by repairing, rehabilitating, or restoring the affected environment; (4) reduce or eliminate the affect over time by preservation and maintenance operations; (5) compensate for the affect by replacing, enhancing or providing substitute resources or environments; and/or (6) monitor the affect and taking appropriate corrective measures.
mitigation bank	A mitigation project constructed in advance of planned development to mitigate for unavoidable effects on wetlands and their associated habitat. Banks are generally sized to provide sufficient mitigation for several development projects in one location. As a result, the bank typically provides higher functioning wetlands and more useable habitat than may be possible on an individual project scale.
National Ambient Air Quality Standards (NAAQS)	Standards established by the Environmental Protection Agency under the Clean Air Act for pollutant concentrations in outside air throughout the country. See also: "criteria pollutants".

Term	Meaning
National Environmental Policy Act (NEPA)	Federal legislation adopted in 1969 that established a national environmental policy intentionally focused on federal activities and the desire for a sustainable environment balanced with other essential needs of present and future generations. NEPA also established federal agency responsibility and created the basic framework for integrating environmental considerations into federal decision-making. The fundamentals of the NEPA decision-making process include: an interdisciplinary approach in planning and decision-making for actions that affect the human environment, interagency coordination, consideration of alternatives, examination of potential environmental consequences and mitigation, documentation of the analysis, and making the information available to the public for comment prior to implementation.
National Pollutant Discharge Elimination System (NPDES)	The federal program under Section 402 of the Clean Water Act for issuing, monitoring, and enforcing permits, and imposing and enforcing pretreatment requirements for discharges of pollutants from point sources to tidal waters, lakes, wetlands, rivers, streams, or other water courses.
nitrogen oxides (NO <sub>x</sub> )	A product of combustion from transportation and stationary sources resulting from nitric oxide combining with oxygen in the atmosphere; a contributor to the formation of ozone, which is a major component of photochemical smog. This includes NO and NO <sub>2</sub> .
non-attainment area	An area that does not meet one or more of the National Ambient Air Quality Standards (NAAQS) for the criteria pollutants designated in the Clean Air Act.
nutrients	Essential chemicals needed by plants or animals for growth, such as phosphorus.

Term	Meaning
ordinary high water mark (OHWM)	The elevation marking the highest water level which is so common and maintained for a sufficient time in all ordinary years that it leaves evidence upon the landscape, such as a clear, natural line impressed on the bank, changes in soil character, destruction of or change in vegetation, or the presence of litter and debris. Generally, it is the point where the natural vegetation changes from predominately aquatic to upland species. Where the ordinary high water mark cannot be found, it is the line of mean annual flood - the highest the water gets in an average year, but not the highest it gets during extreme flooding.
outfall	The point of discharge for stormwater runoff; also the outlet or mouth of a drain pipe or culvert that discharges stormwater runoff.
ozone (O <sub>3</sub> )	Ozone is a natural form of oxygen that provides a protective layer shielding the earth from ultraviolet radiation. It also is a chemical oxidant and major component of photochemical smog. Ozone can seriously impair the respiratory system and is one of the most widespread of all the criteria pollutants regulated under the Clean Air Act. Ozone in the troposphere is produced through complex chemical reactions of nitrogen oxides, which are among the primary pollutants emitted by combustion sources; hydrocarbons, released into the atmosphere through the combustion, handling and processing of petroleum products; and sunlight.
particulate	A very small solid suspended in air or water. Sources of particulate matter include sea salt, pollen, smoke from forest fires and wood stoves, road dust, industrial emissions, and agricultural dust. Some particles may be small enough to be drawn deep into the respiratory system where they can contribute to infection and reduced resistance to disease.
pervious	Having pores or openings that permit liquids or gases to pass through.

<b>Term</b>	<b>Meaning</b>
pervious surface	A surface that allows the penetration of liquids, such as grassy areas.
PM <sub>2.5</sub>	Particulate matter less than 2.5 micrometers in diameter.
PM <sub>10</sub>	A standard for measuring the amount of solid or liquid matter suspended in the atmosphere, specifically, particulate matter less than 10 micrometers in diameter. Smaller PM <sub>10</sub> particles can penetrate to the deeper portions of the lung, affecting sensitive population groups such as individuals with respiratory ailments and children.
pollutant	Any substance introduced into the environment that contaminates or otherwise adversely affects the usefulness of a resource.
Puget Sound Regional Council (PSRC)	The Metropolitan Planning Organization (MPO) and Regional Transportation Planning Organization (RTPO) for the central Puget Sound region, which is comprised of Snohomish, King, Pierce, and Kitsap counties. The MPO and RTPO is the legally-mandated forum for cooperative decision-making about regional growth policies and transportation issues in the metropolitan planning area.
recharge	Water, whether precipitation, surface water, or groundwater, that enters and adds to an aquifer.
recharge area	Land area important for retaining precipitation as part of the groundwater hydrology of the region.
resident fish	Fish that do not migrate out to the ocean, but remain in fresh water.
restoration	To improve a disturbed or altered wetland by returning wetland parameters that may be missing.

Term	Meaning
retention/detention pond	A drainage facility designed to reduce stormwater runoff quantity and quality effects either by holding the increased runoff volume that results from development for a considerable amount of time, allowing the suspended particles to settle out, and then slowly releasing it through natural means on site; or by holding the runoff for a short period of time and then releasing it to the stormwater management system for treatment and discharge.
right-of-way	Land purchased prior to the construction of transportation improvements along with land for sound walls, retaining walls, stormwater facilities, and other project features. This also includes permanent or temporary easements for construction and maintenance. Vacant land may also be set aside for future highway expansion under certain circumstances.
riparian	Pertaining to anything connected with or immediately adjacent to the banks of a stream, river, or other water body.
riparian area	The land and habitat adjacent to streams, lakes, estuaries, or other waterways, comprising the transition area between the aquatic ecosystem and the nearby upland terrestrial ecosystem. Riparian corridors, or zones, identified by soil characteristics or plant communities, include the wet areas in and near streams, ponds, lakes, springs, and other surface waters.
runoff	Rainwater or snowmelt that leaves an area as a surface drainage.
salmonid	Any member of the family Salmonidae, which includes all species of salmon, trout, and char (including bull trout).
sediment	Material that originates from weathering and erosion of rocks, dirt, or unconsolidated deposits and organic material. Sediment is carried and deposited by wind, ice or water. It is often transported by stormwater runoff and may be suspended within the water.

Term	Meaning
sensitive species	Any native wildlife species that is vulnerable or declining and is likely to become endangered or threatened throughout a substantial portion of its range without cooperative management or removal of threats.
Shoreline Management Act (SMA)	Washington State legislation adopted in 1971 that requires local jurisdictions to create and implement a Shoreline Master Program (SMP). The purpose of the SMP is to regulate land use and new development within sensitive shoreline areas. Shorelines, according to the SMA, include all areas typically within 200 feet inland from principal bodies of water (rivers and streams with flows of at least 20 cubic feet per second, lakes over 20 acres, and tidal areas) and associated wetlands. The local SMP identifies standards of protection for shoreline areas, and typically contains shoreline policies, shoreline use environments or zones, and specific shoreline regulations. The final SMP is subject to approval by the State Department of Ecology.
Sound Move	The Central Puget Sound Regional Transit Authority (Sound Transit) ten-year (1996 to 2006) regional transit system plan for implementing commuter rail, light rail, and regional express bus service and HOV facilities in parts of King, Pierce, and Snohomish counties.
species of concern	Species whose conservation standing is of concern to the U.S. Fish and Wildlife Service, but for which status information is still needed for consideration to list the species under the Endangered Species Act.
State Environmental Policy Act (SEPA)	Washington State legislation adopted in 1974, that establishes an environmental review process for all development proposals and major planning studies prior to taking any action. SEPA includes early coordination to identify and mitigate any substantial issues or substantial effects that may result from a project or study.

Term	Meaning
State Implementation Plan (SIP)	Plan developed by state government to attain and maintain compliance with the National Ambient Air Quality Standards.
state-listed species	Species of wildlife that are considered to be at-risk and are protected by Washington State laws.
stormwater	The portion of precipitation that does not naturally percolate into the ground or evaporate, but flows overland, in channels, or in pipes into a defined surface water channel or a constructed stormwater facility.
stormwater detention	The process of storing stormwater in manmade facilities such as ponds or vaults and releasing the stormwater at a controlled rate. This helps control the volume and rate at which stormwater enters streams and rivers. Controlling the flow of stormwater helps maintain or improve conditions in the streams and minimizes erosion of stream banks.
study area	The area specifically evaluated for environmental effects.
threatened species	Any species that is likely to become endangered within the foreseeable future throughout all or a substantial portion of its range.
total suspended solids	Soil and other particles that are carried in water. High levels of soil particles can make a water body appear muddy or cloudy and affect fish by clogging gills and reducing their ability to see and forage for food.
transportation facility	Roadways, access ramps, noise walls, retaining walls, traffic barriers, transit stations, park-and-ride structures, non-motorized facilities, signage, lighting, stormwater treatment and conveyance, and landscaping within the project area.
Transportation Improvement Plan (TIP)	Regional plan prepared by the metropolitan planning organization outlining what projects are funded and planned for construction. In the Puget Sound region, the TIP is prepared by the Puget Sound Regional Council (PSRC) using a six-year planning horizon.

Term	Meaning
tributary	A stream or other body of water that contributes its water to another stream or body of water.
turbidity	A condition caused by suspended sediments or floating material that clouds the water and makes it appear dark and muddy.
urban growth area	For jurisdictions planning under the Washington State Growth Management Act, an area that is planned to support urban-type development and densities (typically having a minimum density of four residential units per acre).
urban growth boundary	For jurisdictions planning under the Washington State Growth Management Act, the boundary that divides areas that are planned to support urban-type development and densities (typically having a minimum density of four residential units per acre) from those areas that are expected to remain rural in character and level of development (typically having fewer than four residential units per acre).
vehicle	Any car, truck, van, motorcycle, or bus designed to carry passengers or goods. Bicycles and other pedestrian-oriented vehicles are not included in this definition.
vehicle miles traveled (VMT)	The number of miles traveled by all vehicles, usually reported for a given area or population.
Water Resource Inventory Area (WRIA)	An administrative and planning area designated by the Washington State Department of Ecology for addressing water and aquatic resource management issues. Sixty-two WRIsAs have been designated, corresponding to the state's major watershed basins. The terms WRIA and watershed are frequently used interchangeably, although a WRIA may include more than one watershed.
watershed	The region of land that drains into a specific body of water such as a river, lake, sea, or ocean. Rain that falls anywhere within a given body of water's watershed will eventually drain into that body of water.

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<b>Term</b>	<b>Meaning</b>
wetland	Areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

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#### ***Exhibit 1***

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#### ***Exhibit 2***

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#### ***Exhibit 3***

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#### ***Exhibit A-1***

WSDOT. 2006 – 2007. I-405 Staff for HDR; Air Quality Study Area.

#### ***Exhibit A-2***

WSDOT. 2006 – 2007. I-405 Staff for HDR; Wetland and Aquatic Study Area, Wildlife Study Area.

#### ***Exhibit A-3***

WSDOT. 2006 – 2007. I-405 Staff; project location.

### BASE DATA

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## **Appendix A: METHODOLOGY**

### **GUIDANCE FOR CONDUCTING A CUMULATIVE EFFECTS ANALYSIS**

Guidance from the Council on Environmental Quality (CEQ), Federal Highway Administration (FHWA), and the Washington State Department of Transportation (WSDOT) was followed for analyzing and assessing cumulative effects due to the I-405, NE 8th Street to SR 520 Improvement Project. Brief discussions of the CEQ, FHWA, and WSDOT guidance follow.

#### ***Council on Environmental Quality***

CEQ regulations implementing the procedural provisions of the National Environmental Policy Act (NEPA) 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.”<sup>44</sup>*

The cumulative effects of an action may be undetectable when viewed in the individual context of direct and even indirect effects, but they can add to other disturbances and eventually lead to a measurable environmental change. Cumulative effects should be considered along with the direct and indirect effects of each alternative. The range of alternatives considered includes the No Build Alternative as a baseline against which to evaluate cumulative effects. The range of actions to be considered includes not only the proposed project but all connected and reasonably foreseeable similar actions that could contribute to cumulative effects. Related actions should be addressed in the same analysis. The CEQ 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.

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<sup>44</sup> 40 CFR 1508.7 Protection of Environment, Council on Environmental Quality, Cumulative Impact.

- Rely on information from other agencies and organizations on reasonably foreseeable projects or activities that are beyond the scope of the analyzing agencies' purview.
- Relate to the geographic scope of the proposed project.
- Relate to the time period of the proposed project.

A cumulative effects analysis (CEA) involves assumptions and uncertainties, with choices supported by the best analysis based on the best available data. Monitoring programs and/or research can be identified to improve the available information and, thus, the analyses in the future. Where uncertainties exist, adaptive management provisions can be incorporated into whichever alternative is eventually selected.

Cumulative effects can be positive as well as negative, depending on the resource element (e.g., air quality, fish, etc.) being evaluated. It is possible that some resource elements can be negatively and others positively affected by the same proposed project. Most cumulative effects analyses will identify varying levels of beneficial and adverse effects depending on the resource elements and the specific actions. Because of this potential mixture of effects, it is sometimes difficult to determine which alternative is best. The CEQ handbook, *Considering Cumulative Effects under the National Environmental Protection Act*, has been used as a valuable reference tool in this analysis.

### **Federal Highway Administration**

The Federal Highway Administration (FHWA) implements the NEPA and the CEQ guidelines through its environmental regulations (23 CFR 771).<sup>45</sup> FHWA regulations do not explicitly address cumulative effects. The definition for categorical exclusion (CE) actions does include potential effects from cumulative CE actions. FHWA policy is also provided in a position paper<sup>46</sup> and a memorandum<sup>47</sup> dated January 31, 2003. The January 31, 2003, memorandum states:

*“An appropriately thorough review of the probable direct and indirect effects of FHWA actions and documentation of other cumulative effects on specific resources is essential to a reasoned and informed project decision and will assist in attaining FHWA’s environmental streamlining and stewardship goals.”*

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<sup>45</sup> Federal Highway Administration, Department of Transportation, Environmental Impact and Related Procedures.

<sup>46</sup> Federal Highway Administration, *Position Paper on Secondary and Cumulative Impact Assessment in the Highway Development Process*, published August 20, 1992.

<sup>47</sup> Federal Highway Administration, *Interim Guidance: Questions and Answers Regarding Indirect and Cumulative Impact Considerations in the NEPA Process*, published January 31, 2003.

Per FHWA guidance, the potential relationship of a transportation proposal to indirect effects must be established on a case-by-case basis early in the NEPA project development process. A CEA is resource area-specific and generally performed for the resource areas directly affected by the action under study (such as a transportation project). However, not all of the resource areas directly affected by a project will require a CEA. The environmental resource areas subject to a CEA should be determined on a case-by-case basis early in the NEPA process, generally as part of early coordination or scoping.

### **Washington State Department of Transportation**

Although the WSDOT does not currently provide specific guidance for cumulative effects analyses, the *WSDOT Environmental Procedures Manual* refers to the CEQ and FHWA materials. Further, the *Washington State Environmental Policy Act Rules*<sup>48</sup> require cumulative effects to be analyzed.

## **SCOPE OF THE CUMULATIVE EFFECTS ANALYSIS**

### **Critical Resources**

The CEA for the I-405, NE 8th Street to SR 520 Improvement Project used the CEA in the *I-405 Corridor Program Final EIS* as a starting point. The I-405 Corridor Program CEA focused on air quality, energy, farmlands, aquatic resources, surface waters, and wetlands. However, for the I-405, NE 8th Street to SR 520 Improvement Project, neither energy nor farmlands were included in the CEA. 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 waters, wetlands, and aquatic resources due to the I-405, NE 8th Street to SR 520 Improvement Project.

### **Geographic Boundaries and Time Period**

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 limits to consider past, present, and future actions that may affect the environmental resources of concern.

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<sup>48</sup> WAC 197-11-792 Washington State Environmental Policy Act Rules, Scope.

The geographic scope of analysis is defined by the physical limits or boundaries of the I-405, NE 8th Street to SR 520 Improvement 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 time limits that are both relevant to the project and reasonable. The geographic boundaries and time period can be different for each environmental resource evaluated.

The geographic boundaries and time period established for the CEA for the I-405, NE 8th Street to SR 520 Improvement Project were based on those used in the *I-405 Corridor Program Final EIS*, scoping, agency consultations, and the area directly affected by the project itself.

- **Geographic Boundaries**

The geographic boundary for the project-level air quality CEA was set at one-half mile from the centerline of the project right-of-way (Exhibit A-1). 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 waters, wetlands, and aquatic resources CEAs were set at one mile from the centerline of the project right-of-way (Exhibit A-2). Expanding the geographic area beyond that of the direct effect area of the project allowed a more comprehensive analysis of the cumulative effects on the environmental resources.

Exhibit A-1: CEA Boundary for Air Quality



### Exhibit A-2: CEA Boundaries for Surface Waters, Wetlands, and Aquatic Resources



- **Time Period**

The time period from 1960 through 2030 was set for the four environmental resources that were analyzed (air quality, surface waters, wetlands, and aquatic resources). 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.

### **Framework for the Cumulative Effects Analysis**

The environmental effects of improvements to I-405 and all other proposed transportation investments in the region were reviewed in the *Final EIS for Destination 2030*<sup>49</sup> (*Destination 2030*). The potential cumulative effects of the I-405 Corridor Program, and other Metropolitan Transportation Plan improvements, were re-evaluated in the *I-405 Corridor Program Final EIS*. That Final EIS expanded on *Destination 2030* by analyzing slightly different combinations of plans and other transportation improvements. The *I-405 Corridor Program Final EIS* utilized the Puget Sound Regional Council (PSRC) land use forecasting model (DRAM/EMPAL) to provide a partial basis for evaluating the geographic distribution of potential cumulative effects on critical resources, ecosystems, and human communities. Although the *I-405 Corridor Program Final EIS* served as a starting point for this CEA, the forecasting model was not applied at the project-specific level because mobility improvements contained in the I-405, NE 8th Street to SR 520 Improvement Project will be more noticeable at the local level, and will result in few measurable changes in mobility at the regional level.

The direct effects on the critical resources (air quality, surface waters, wetlands, and aquatic resources) caused by the I-405, NE 8th Street to SR 520 Improvement Project were determined first. The indirect effects resulting from the direct effects on the critical resources were then estimated. Similar information, to the extent it was available, was assembled for each of the other projects considered in this CEA. Finally, the direct and indirect effects were re-examined to estimate the contribution to cumulative effects on each critical resource resulting from the project alone as well as when combined with the other projects included in this CEA.

### **OTHER MAJOR FUTURE PROJECTS INCLUDED IN THE CUMULATIVE EFFECTS ANALYSIS**

Other nearby major future projects were included in the CEA if: (a) they were planned, approved, and funded or likely to receive funding in a relatively short period (five years

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<sup>49</sup> *Final EIS for Destination 2030, The Metropolitan Transportation Plan for the Central Puget Sound Region* (PSRC 2001).

or less) of time; (b) all or a portion of the projects will be located within or close to the CEA geographic boundaries; and (c) the projects will be initiated before 2030. The effects from these projects were evaluated because they could result in cumulative effects on the critical resources. Exhibit A-3 shows where these other projects are, or will be, located.

**Exhibit A-3: Other Projects Considered in this CEA**



Projects considered in this CEA were:

### ***NE 10th Street Extension (City of Bellevue/WSDOT)***

The City of Bellevue is planning to extend NE 10th Street from 116th Avenue NE (between Overlake Hospital and the new Group Health Bellevue Medical Center) to the eastern edge of I-405. The new arterial will be five to seven lanes wide. One additional southbound lane will be constructed along 116th Avenue SE. Two new signalized intersections, sidewalks, landscaping, and urban design elements will also be added. In the second stage, WSDOT will build a bridge to extend NE 10th Street across I-405 to 112th Avenue NE. With this project, the City of Bellevue and WSDOT will:

- Provide a new route across I-405
- Improve access in the north end of downtown Bellevue
- Help relieve congestion on NE 8th Street
- Provide better access to emergency facilities

The City of Bellevue began construction in 2007 and expects to complete stage 1 in 2008. WSDOT plans to begin construction of stage 2 in 2008.

### ***Overlake Hospital Medical Center (OHMC) Expansion***

The OHMC is implementing a three-year expansion plan at 1035 – 116th Avenue NE. The plan involves the construction of a new five-storey, 200,000-square-foot patient facility (South Tower) just south of the existing hospital, a six-storey 200,000-square-foot medical office building in the northwest section of the campus, a 250,000-square-foot Group Health specialty center, and a 370-car underground parking area. Construction of the South Tower began in 2005. The Group Health specialty center is slated to open in 2008.

### ***I-405, South Bellevue Widening Project (WSDOT)***

The I-405, South Bellevue Widening Project, also known as the 112th Avenue SE to SE 8th Street Project, will help relieve congestion at one of the worst I-405 bottlenecks--the drive in and out of Bellevue.

WSDOT and its design-build contractor, Atkinson Construction, have begun construction to widen I-405 within the City of Bellevue between 112th Avenue SE and SE 8th Street.

Crews will build the project in two stages:

**Stage 1: July 2007 - September 2008**  
**Between 112th Ave SE and I-90**

- Add a new northbound lane from 112th Avenue SE to I-90
- Build a new, three-lane, southbound bridge over I-90
- Widen the existing northbound bridge over Coal Creek Parkway

**Stage 2: March 2008 - August 2009**  
**Between I-90 and SE 8th**

- Build one new lane in each direction from I-90 to SE 8th Street
- Remove the Wilburton Tunnel
- Convert the existing southbound bridge over I-90 to carry the northbound HOV lane

***I-405, SR 520 to I-5 Improvement Project (WSDOT)***

The I-405, SR 520 to I-5 Improvement Project (SR 520 to I-5 Improvement Project) is part of the overall I-405 corridor program designed to improve safety, reduce congestion, and add travel capacity. The project extends approximately 15 miles along I-405 from SR 520 in Bellevue at the southern limit, to I-5 in Lynnwood at the northern limit. WSDOT has identified the primary construction elements of the SR 520 to I-5 Improvement Project to be:

- Construct one northbound lane between NE 124th Street and SR 522
- Construct one northbound lane between NE 195th Street and SR 527
- Reconstruct the bridge structures at NE 132nd Street
- Construct a grade separation between the I-405 northbound on-ramp from NE 160th Street and the northbound I-405 off-ramp to SR 522

The SR 520 to I-5 Improvement Project complements the I-405, SR 520 to SR 522 Kirkland Nickel Improvement Project (Kirkland Nickel Project).

The purpose of the SR 520 to I-5 Improvement Project is to improve personal and freight mobility, and reduce traffic congestion in the I-405 corridor from Bellevue to Lynnwood. Specific benefits of the project include improved safety, reduced traffic congestion, increased travel speeds during peak travel periods, improved freight movement, and environmental improvements.

The baseline condition for the SR 520 to I-5 Improvement Project assumes completion of the improvements that have already been environmentally cleared and permitted as a part of the Kirkland Nickel Project (Kirkland Nickel Stage 1 is currently under construction and Kirkland Nickel Stage 2 will be constructed at a later date concurrent with the SR 520 to I-5 Improvement Project).

One of the alternatives being considered involves implementing an express toll lane system.

Construction is expected to begin in mid-2009 with completion by 2011.

### ***SR 520 Bridge Replacement and HOV Project (WSDOT)***

The SR 520 Bridge Replacement and HOV Project proposes to replace SR 520's Portage Bay and Evergreen Point bridges and improve the existing roadway between I-5 in Seattle and Bellevue Way (108th Avenue NE ) on the Eastside. The new bridges will have improved resistance to windstorms and earthquakes. The new roadway will also have wider shoulders to help reduce congestion and a new regional bicycle/pedestrian path across Lake Washington that will link to other elements of the regional trail system.

The new SR 520 corridor will include six lanes (two outer general purpose lanes and one inside HOV lane in each direction).

SR 520 will be rebuilt from I-5 to 108th Avenue Northeast in Bellevue, with an auxiliary lane added on SR 520 eastbound east of I-405 to 124th Avenue Northeast. Both the Portage Bay and Evergreen Point bridges will be replaced.

Overpasses along SR 520 will also be rebuilt.

Roadway shoulders will meet current standards (10-foot inside shoulder and 10-foot outside shoulder).

A 14-foot-wide bicycle/pedestrian path will be built along the north side of SR 520 through Montlake and the Evergreen Point Bridge and along the south side of SR 520 through the Eastside to 96th Avenue Northeast.

Noise walls will be built along much of SR 520 in Seattle and the Eastside.

This project will include stormwater treatment and electronic toll collection.

This project will also add five 500-foot-long lids to be built across SR 520 to reconnect

communities along SR 520: Roanoke, North Capitol Hill, Portage Bay, Montlake, Medina, Hunts Point, Clyde Hill, and Yarrow Point. The lids will be located at 10th Avenue East and Delmar Drive East, Montlake Boulevard, Evergreen Point Road, 84th Avenue Northeast, and 92nd Avenue Northeast.

The floating bridge pontoons of the Evergreen Point Bridge will be sized to carry future high capacity transit. The project does not include an HCT alignment.

A flexible transportation plan will provide funding to promote alternative modes of travel and increase the efficiency of the system, including intelligent transportation and technology, traffic systems management, vanpools and transit, education and promotion, and land use as demand management.

The comment period for the Draft EIS closed on October 31, 2006. A Supplemental Draft EIS is being prepared.

### ***Various Major Projects in Downtown Bellevue (Various Developers)***

Various developers have 16 major projects under construction, 11 in review, and several more in the early planning stages in downtown Bellevue. All but two are located west of I-405 and include office towers, condominiums, retail space, senior housing, apartments, town homes, hotels, and a performing arts center. The two projects east of I-405 are associated with the Overlake Hospital Complex.<sup>50</sup> All of the 30 projects are, for the most part, located on previously developed land with existing impervious surfaces.

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<sup>50</sup> [http://www.bellevuewa.gov/pdf/PCD/COB\\_MajorProjects.pdf](http://www.bellevuewa.gov/pdf/PCD/COB_MajorProjects.pdf)