I-405 Bellevue Nickel Improvement Project
I-90 to Southeast 8th Street

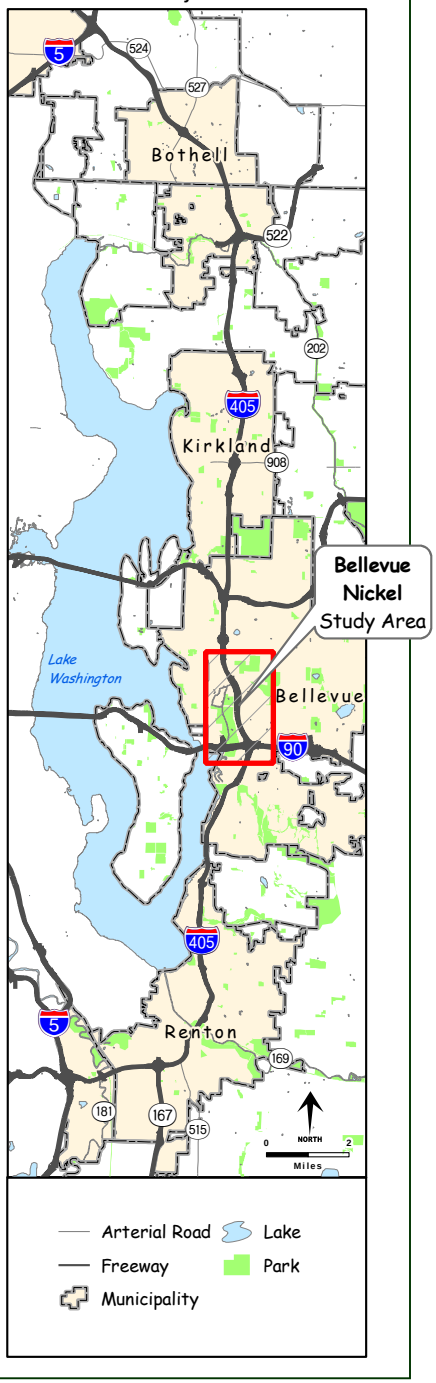
INTERSTATE 405 Corridor Program

Congestion Relief & Bus Rapid Transit Projects

CUMULATIVE EFFECTS ANALYSIS
DISCIPLINE REPORT

January 2006

I-405 Project Area



Washington State Department of Transportation

U.S. Department of Transportation
Federal Highway Administration

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Glossary

action area	The area addressed in a biological assessment that includes the immediate footprint of the project and all areas directly or indirectly affected by a federal action.
adaptive management	A scientific policy intended to improve management of biological resources—particularly in areas of scientific uncertainty. Program actions and results are monitored and evaluated. Program actions are then adjusted, if needed, to achieve the desired results.
anadromous fish	A fish species that spends a part of its life cycle in the sea and returns to freshwater streams to spawn.
basin	The area of land drained by a river and its tributaries, draining water, organic matter dissolved nutrients, and sediments into an ocean, lake, or stream.
BMPs	Best management practices are generally accepted techniques that, when used alone or in combination, prevent or reduce adverse effects of a project. Examples include erosion control measures and construction management to minimize traffic disruption. Please see Appendix A for a complete list of BMPs.
categorical exclusion	A category of actions, which do not individually or cumulatively have a significant effect on the environment and for which neither an environmental assessment nor an environmental impact statement is required under NEPA.
conservation	Defined by the Endangered Species Act (ESA) as the use of all methods and procedures, which 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	The federal agency charged with implementing the National Environmental Policy Act.
cumulative effect	Effect on the environment, which results from the incremental effect of the 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.
criteria pollutants	The 1970 amendments to the Clean Air Act required the Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards for certain pollutants known to be hazardous to human health. The EPA has identified and set standards to protect human health and welfare for six pollutants: ozone, carbon monoxide, total suspended particulates, sulfur dioxide, lead, and nitrogen oxide. The term, “criteria pollutants” derives from the requirement that the EPA must describe the characteristics and potential health and welfare effects of these pollutants. It is on the basis of these criteria that standards are set or revised.
critical habitat	The specific areas within the geographical area occupied by a species at the time it is listed in accordance with the Endangered Species Act, on which are found those physical or biological features essential to the conservation of the species, and which may require special management considerations or protection; and specific areas outside the geographic area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species.

Glossary

direct access	A ramp or roadway connecting arterial streets directly to HOV lanes, allowing buses, carpools, and vanpools to get on or off the highway without having to cross several lanes of traffic.
direct effect	Effect caused by the proposed action and occurring at the same time and place.
ecology embankment	A stormwater treatment facility constructed in the permeable shoulder area of a highway, consisting of a vegetation-covered French drain containing filter media.
effect	Includes ecological effects (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health effects, whether direct, indirect, or cumulative. Effects may include those resulting from actions that may have both beneficial and detrimental effects, even if on balance the agency believes the effect will be beneficial.
escapement	The number of adult fish that enter a fresh water system to spawn.
evolutionarily significant unit	The term used by National Marine Fisheries Service for a fish species population protected by a listing under the Endangered Species Act.
flood hazard areas	Frequently flooded areas.
forest duff	Forest litter and other organic debris in various stages of decomposition on top of the mineral soil; typical of conifer forests in cool climates where the rate of decomposition is slow and litter accumulation exceeds decay.
glide	A section of stream that has little or no turbulence.
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.
impervious areas	Surfaces areas (e.g., roadways, parking lots, and rooftops) where rainfall or runoff cannot infiltrate into the ground.
indirect effect	Effect caused by the proposed action that is later in time or farther removed in distance, but 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, including ecosystems.
infiltration	The downward movement of water from the surface into the subsoil.
large woody debris	Naturally occurring or artificially placed coniferous or deciduous logs, limbs, or root wads, 12 inches or larger in diameter, used as a habitat element in a stream or river.
maintenance area	Area that has recently met the National Ambient Air Quality Standards for the criteria pollutants designated in the Clean Air Act and being managed to continue to meet the Standards.

Glossary

macroinvertebrate	Small animals (insects, worms, larvae, etc.) without backbones, which are visible with the naked eye. Waterbodies have communities of aquatic macroinvertebrates. The species composition, species diversity, and abundance of the macroinvertebrates can provide valuable information on the relative health and water quality of a waterbody.
National Ambient Air Quality Standards (NAAQS)	Standards established by the EPA for pollutant concentrations in outside air throughout the country. (See "criteria pollutants" and "state implementation plans.")
non-attainment area	Area that does not meet one or more of the National Ambient Air Quality Standards for the criteria pollutants designated in the Clean Air Act.
pervious	Having pores or openings that permit liquids or gases to pass through.
recharge area	Land area important for retaining rainwater as part of the groundwater hydrology of the region.
riffle	A shallow area of a stream or river in which water flows rapidly over a rocky or gravelly streambed.
riparian	Land that occurs along or interacts with flowing water.
riprap	A sustaining wall of stones on a soft bottom.
runoff	Rainwater or snowmelt that directly leaves an area as surface drainage.
salmonid	A fish of the family Salmonidae; for example, salmon, trout, and char.
stormwater	That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows overland into a defined surface waterbody or a constructed infiltration facility.
total suspended solids	Soil 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.
uplands	Any area that does not qualify as a wetland because it is not sufficiently wet to permit development of vegetation, soils, and/or other characteristics associated with wetlands.
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.
water resource inventory area	A Water Resource Inventory Area (WRIA) may include more than one watershed. Washington State is divided into 62 WRIAs for water and aquatic resource management issues. The terms "WRIA" and "watershed" are frequently used interchangeably.

Acronyms and Abbreviations

AQMP	Air Quality Maintenance Plan
BA	biological assessment
BMP	best management practice
BNSF	Burlington Northern Santa Fe Railroad
CAA	Clean Air Act
CAO	Critical Area Ordinance
CAWA	Clean Air Washington Act
CE	Categorical Exclusion
CEA	cumulative effects analysis
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	cubic feet per second
CO	carbon monoxide
CWA	Clean Water Act
CWPP	County-Wide Planning Policies
DDT	dichloro-diphenyl-trichloroethane
DO	dissolved oxygen
DOT	U.S. Department of Transportation
EA	environmental assessment
Ecology	Washington State Department of Ecology
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESU	evolutionarily significant unit
FHWA	Federal Highway Administration

Acronyms and Abbreviations

FTA	Federal Transit Administration
GMA	Growth Management Act
HCT	high-capacity transportation (e.g., light rail, commuter rail, and bus rapid transit)
HOV	high-occupancy vehicle
I-405	Interstate 405
I-90	Interstate 90
LOS	level of service
LWD	large woody debris
MOA	memorandum of agreement
MTP	Metropolitan Transportation Plan
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
OHMC	Overlake Hospital Medical Center
PAH	polycyclic aromatic hydrocarbon
PCE	primary constituent element
$PM_{2.5}$	particulate matter less than 2.5 micrometers in size
PM_{10}	particulate matter less than 10 micrometers in size
ppm	parts per million
PSCAA	Puget Sound Clean Air Agency
PSRC	Puget Sound Regional Council
RCW	Revised Code of Washington
RM	river mile

Acronyms and Abbreviations

ROW	right of way
SEPA	State Environmental Policy Act
Services	National Marine Fisheries Service and U.S. Fish and Wildlife Service
SIP	State Implementation Plan
SMA	Shoreline Management Act
SR	state route
TCM	transportation control measure
TEA-21	Transportation Equity Act for the 21st Century
TIP	Transportation Improvement Program
TMDL	total maximum daily load
UGA	urban growth area
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VMT	vehicle miles traveled
WAC	Washington Administrative Code
WRIA	water resource inventory area
WQS	Water Quality Standards
WDFW	Washington State Department of Fish and Wildlife
WSDOT	Washington State Department of Transportation

Introduction

In 1998, the Washington State Department of Transportation (WSDOT) joined with the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), Central Puget Sound Regional Transit Authority (Sound Transit), King County, and local governments in an effort to reduce traffic congestion and improve mobility in the Interstate 405 (I-405) corridor. In fall 2002, the combined efforts of these entities culminated in the *I-405 Corridor Program Final Environmental Impact Statement (EIS)* and *FHWA Record of Decision (ROD*).

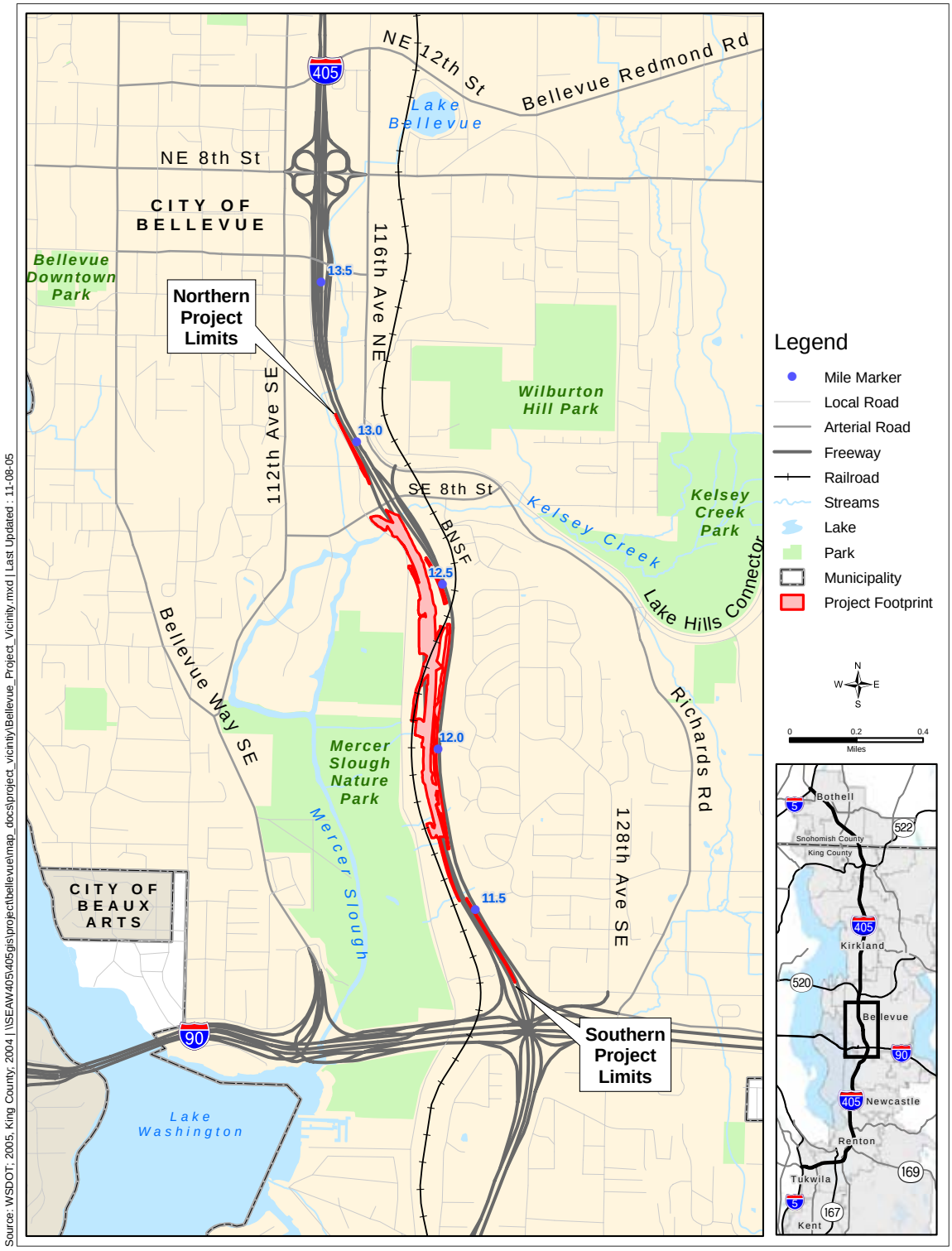
The ROD selected a project alternative that would widen I-405 by as many as two lanes in each direction throughout its 30-mile length. The ultimate configuration of the selected alternative includes buffers separating general-purpose lanes from parallel high-occupancy vehicle (HOV) lanes (potentially used by future high-capacity transit). The design also allows for expanded "managed lane" operations along I-405 that could include use of HOV lanes by other user groups, such as trucks.

In 2003, the Washington State legislature approved a statewide transportation-funding plan called the "nickel package." The nickel package provided funding for congestion relief projects in three critical traffic hotspots along the I-405 Corridor: Renton, Bellevue, and Kirkland. The Bellevue Nickel Improvement Project is one of several projects now moving forward as part of a phased implementation of the I-405 Corridor Program. Exhibit 1 shows the location of the Bellevue Nickel Improvement Project.

In 2003, the Washington State legislature approved a statewide transportation-funding plan called the "nickel package." The nickel package provides funding for congestion relief projects in three critical traffic hotspots along the I-405 Corridor, including Bellevue.

Traffic moving along I-405

Exhibit 1. Project Vicinity Map



In keeping with the direction established in the Final EIS and ROD, we are preparing a National Environmental Policy Act (NEPA) Environmental Assessment (EA) that focuses on project-level effects of constructing and operating the Bellevue Nickel Improvement Project.

The Environmental Assessment will describe new project changes, information, effects, or mitigation measures, but the assessment will not revisit the alternatives, impacts, and mitigation measures evaluated in the corridor-level EIS or the decisions documented in the *Record of Decision.*

We will base the EA on the analysis in the *I-405 Corridor Program Final EIS,* and will describe any new or additional project changes, information, effects, or mitigation measures not identified and analyzed in the corridor-level Final EIS. The project-level EA for the Bellevue Nickel Improvement Project will not reexamine the corridor-level alternatives, impacts, and mitigation measures presented in the corridor-level FEIS, or the decisions described in the ROD.

What alternatives do we analyze in this discipline report?

This discipline report is one of 19 environmental elements WSDOT will study to analyze the effects of the Bellevue Nickel Improvement Project. All of the discipline reports will analyze one build alternative and one "no build" or "no action" alternative. This approach is consistent with FHWA's guidelines for preparing a NEPA EA.

What is the No Build Alternative?

NEPA requires us to include and evaluate the No Build Alternative in this discipline report. We use this approach to establish an existing and future baseline for comparing the effects associated with the Build Alternative. We assume the No Build Alternative will maintain the status quo: only routine activities such as road maintenance, repair, and safety improvements would occur within the corridor between now and 2030. The No Build Alternative does not include improvements that would increase roadway capacity or reduce congestion on I-405. We describe these improvements further in the Bellevue Nickel Improvement Project Traffic and Transportation Discipline Report.

We assume the No Build Alternative will maintain the status quo: only routine activities such as road maintenance, repair, and safety improvements would occur within the corridor between now and 2030.

What are the principal features of the Build Alternative?

The Build Alternative will add one new general-purpose lane in each direction along a 2-mile section of I–405 between Interstate 90 (I-90) and SE 8th Street. The new pavement will

generally be constructed on the inside or "median" side of I-405. After re-striping, the new lanes will be located on the outside of the existing roadway. The Build Alternative also includes new stormwater management facilities and a substantial upgrade of existing drainage structures and systems. Other project activities associated with the Build Alternative include developing on-site stream mitigation and off-site wetland mitigation areas to compensate for the loss of these resources within the study area. We expect project construction to begin in spring 2007 and the improved roadway to be open to traffic by fall 2009.

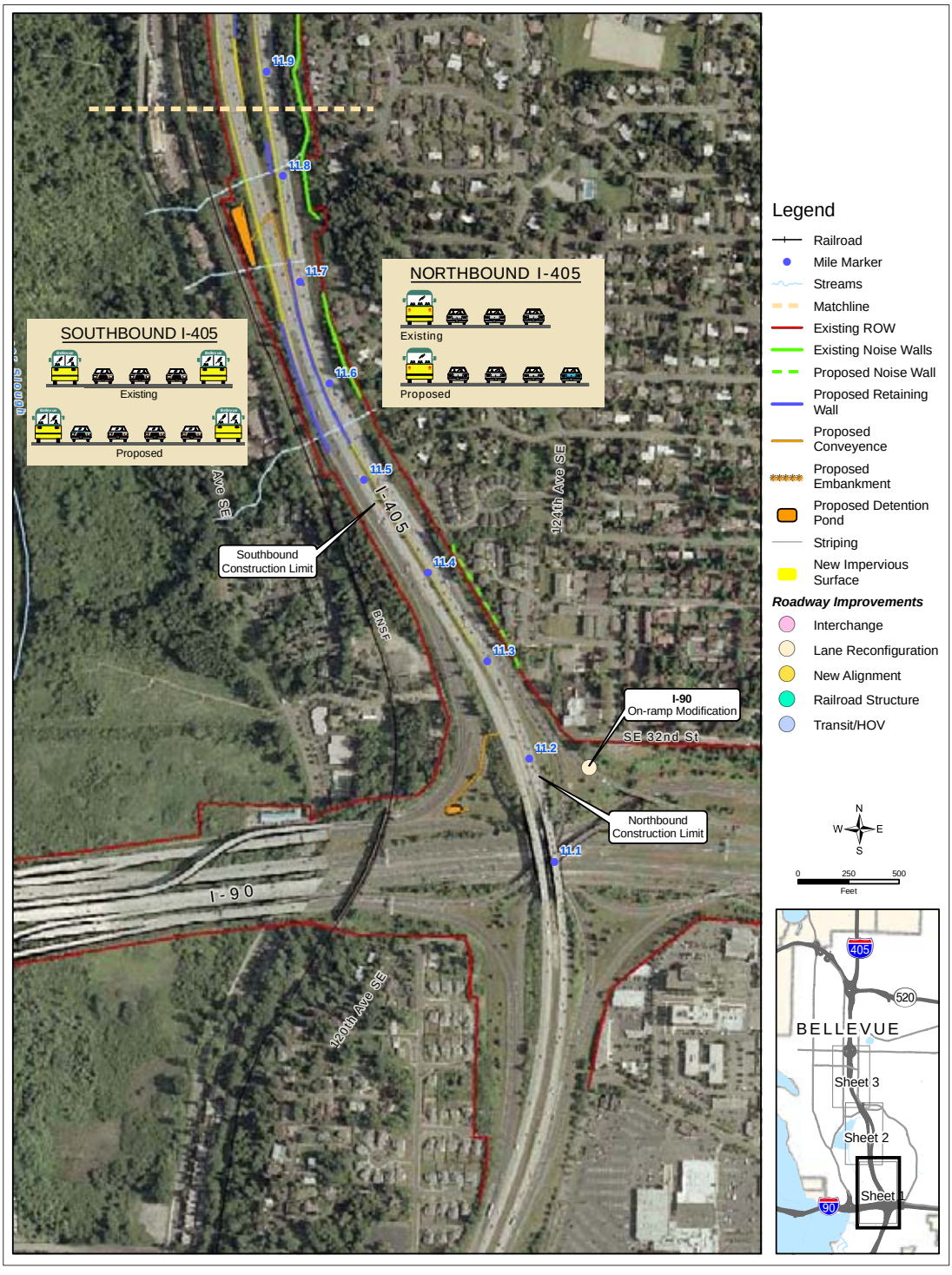
Improvements to Southbound I-405

We will add one lane in the southbound direction of I-405 from approximately SE 8th Street to I-90.

In the southbound (SB) direction, we plan to add one new travel lane from approximately Southeast (SE) 8th Street to I-90 (Exhibits 2, 3, and 4). In addition, the existing outside HOV lane at I-90 will be extended north so that it begins at the on-ramp from SE 8th Street. In order to add these lanes and maintain traffic flow during construction, we will shift approximately 3,000 feet of the SB roadway as much as 200 feet east into the existing median. The relocated SB roadway will connect to the existing SB travel lanes just north of the I-90 interchange, and south of the existing bridge over SE 8th Street.

We will build a new tunnel underneath the Burlington Northern Santa Fe (BNSF) railroad, just east of the existing Wilburton Tunnel, to accommodate the relocated and widened SB roadway. The existing tunnel does not have the capacity to accommodate additional lanes of SB traffic. The existing SB travel lanes and the Wilburton Tunnel will remain open to traffic during construction of the new tunnel and the relocated/widened SB lanes. The new tunnel also will be built wide enough to accommodate additional lanes.

Exhibit 2. Proposed Bellevue Nickel Project Improvements (Sheet 1 of 3)



Source: WSDOT; 2004, King County; 2004 | \\SEAW405\405gis\project\bellevue\map_docs\discipline_reports\project_description\Project Description.mxd | Last Updated : 11-07-05 |

Exhibit 3. Proposed Bellevue Nickel Project Improvements (Sheet 2 of 3)

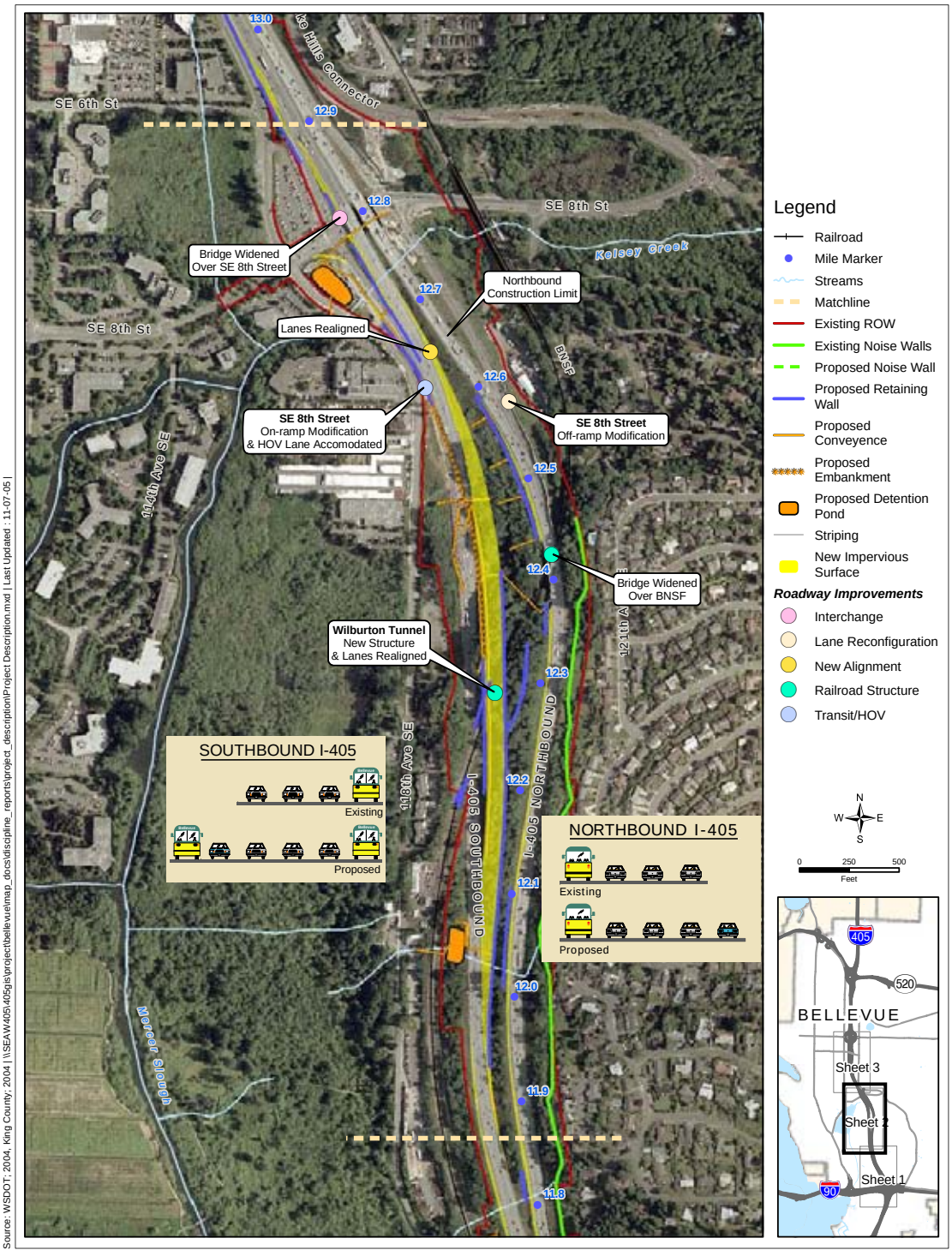
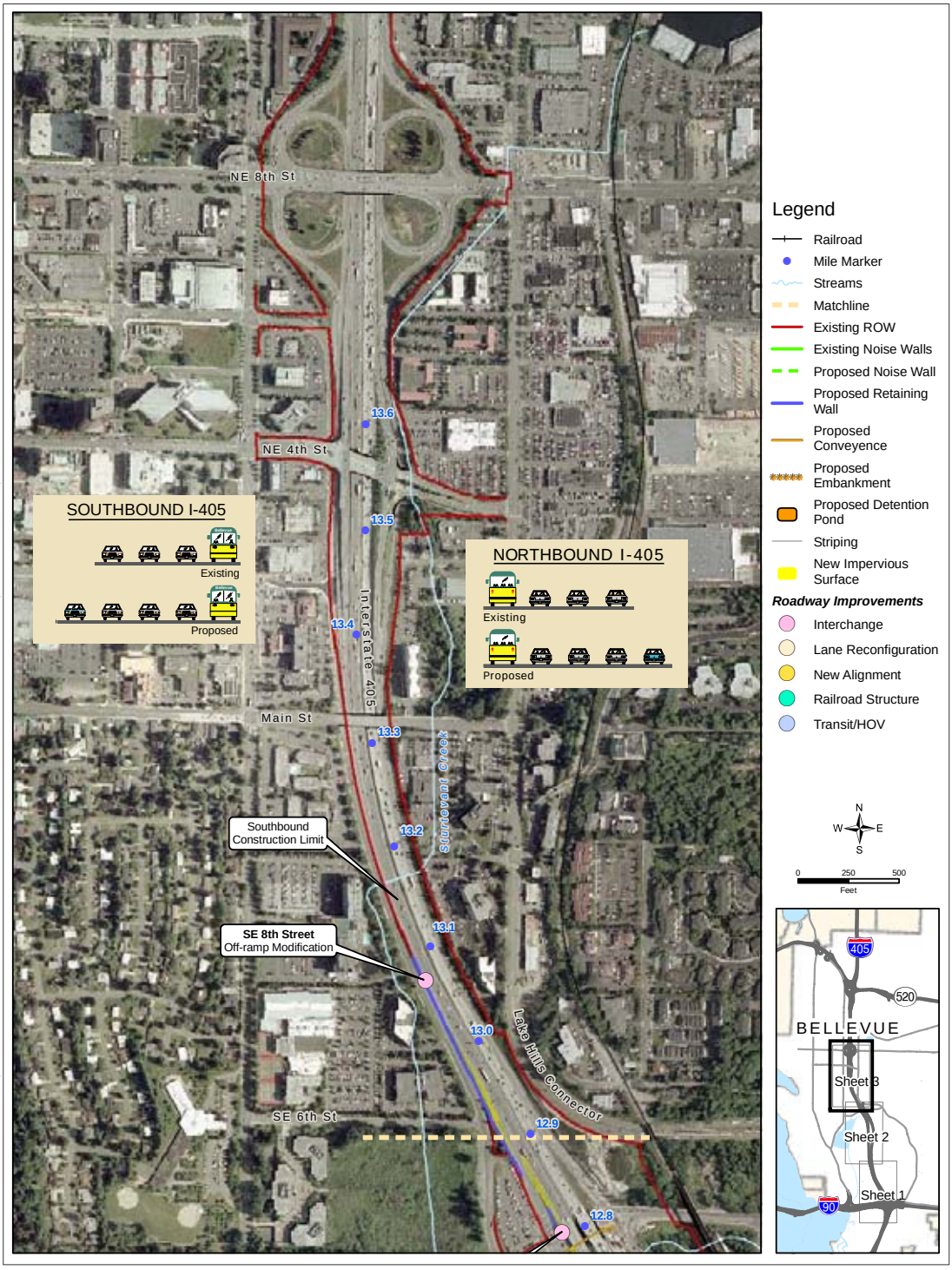


Exhibit 4. Proposed Bellevue Nickel Project Improvements (Sheet 3 of 3)



Source: WSDOT; 2004, King County; 2004 | \\SEAW405\405gis\projectbellevue\map_docs\discipline_reports\project_description\Project Description.mxd | Last Updated : 11-07-05 |

We will also include the following improvements in the Build Alternative:

- Modify the existing off-ramp at SE 8th Street to make room for an additional southbound lane on I-405. The off-ramp will then become a single-lane, optional off-ramp (i.e. the off-ramp will no longer be an "exit only" off-ramp).
- Build a retaining wall between the SB travel lanes and the off-ramp at SE 8th Street.
- Widen the existing bridge over SE 8th Street to the west to accommodate the new SB lane.
- Modify the existing on-ramp at SE 8th Street to tie into the relocated SB general-purpose travel lanes.
- Reconfigure the on-ramp at SE 8th Street to accommodate the extended outside HOV lane.
- Temporarily shift the existing BNSF railroad track from its current alignment to allow for continuous railroad operation during construction of the new tunnel.
- Construct retaining walls along the eastern edge of the relocated SB travel lanes.

Improvements to Northbound I-405

We will add one lane in the northbound direction of I-405 from approximately I-90 to SE 8th Street. All widening of the northbound mainline will occur on the inside (median side) of the existing roadway.

In the northbound (NB) direction, we plan to add one new travel lane from approximately I-90 to SE 8th Street (Exhibits 2, 3, and 4). We will add one new lane to the NB ramp from I-90. We will shift the NB lanes to allow all of the proposed widening to occur on the inside, or median side of the existing roadway.

Additional improvements include:

- Re-stripe the westbound/eastbound I-90 on-ramp to NB I-405 resulting in one lane becoming two lanes in the NB direction.
- Widen, shift, and re-stripe NB I-405 travel lanes north of I-90 to allow the westbound I-90 to NB I-405 on-ramp and the eastbound I-90 to NB I-405 on-ramp to enter I-405 without having to merge into a single lane.
- Construct several retaining walls needed for road widening in locations that allow for existing and future widening of I-405.

- Widen the existing bridge over the BNSF railroad to the west to accommodate the new NB lane.
- Modify the NB off-ramp to SE 8th Street to make it a single-lane "exit-only" off-ramp.
- Transition the NB travel lanes back into the existing lane configuration before crossing over SE 8th Street.

Improvements to the Stormwater Management System

Managing stormwater for the I-405 Bellevue Nickel Improvement Project involves the collection and treatment of rainfall runoff from the new project pavement consistent with the guidelines in the WSDOT Highway Runoff Manual. Currently, less than 5 percent of the existing runoff from paved surfaces in the study area is treated prior to being discharged. We will improve this condition by treating the stormwater from the equivalent pavement areas for the new paved surfaces to address flow control and water quality treatment.

Due to the reconfiguration and new construction associated with the SB lanes, we need to replace much of the existing drainage system. We will continue to use open roadside ditches along the edge of the roadway shoulders as the preferred method of conveyance where possible. Adjacent property development and protected natural areas tightly confine the project corridor. Conveyance will primarily consist of standard WSDOT catch basins and manhole structures that will connect to a system of stormwater drain pipes. These features will transport runoff to treatment and flow control facilities within the existing right of way.

We will construct three new stormwater ponds (detention ponds combined with stormwater treatment wetlands) as part of the project and also enlarge the existing pond at SE 8th Street. Two of the new ponds will be located south of the Wilburton Tunnel between the SB lanes and the BNSF railroad right of way. WSDOT will construct the third new pond in the northwest quadrant of the I-90/I-405 interchange. The project will discharge treated stormwater following existing flow patterns to Mercer Slough or to the wetlands that surround it.

Best Management Practices (BMPs)

BMPs are generally accepted techniques that, when used alone or in combination, prevent or reduce adverse effects of a project. Examples include erosion control measures and construction management to minimize traffic disruption. Please see Appendix A for a complete list of BMPs.

Avoidance Measures

WSDOT will use Best Management Practices (BMPs), WSDOT Standard Specifications, and design elements to avoid or minimize potential effects to the environment for the Bellevue Nickel Improvement Project. Collectively, these measures to

WSDOT Standard Specifications

Guidelines and procedures established by WSDOT for roadway design and construction in a variety of design, engineering, and environmental manuals.

avoid or minimize potential effects to the environment are known as "avoidance measures." We describe these measures in more detail in an Appendix A. If the Bellevue Nickel Improvement Project has additional effects not addressed in the avoidance measures, we will address these measures through mitigation.

Wetland and Stream Mitigation Sites

WSDOT will compensate for adverse effects to wetlands and their buffers by creating just over an acre of wetland within the boundaries of Kelsey Creek Park (Exhibit 5). The site is located north of the intersection of Richards Road and the Lake Hills Connector.

Similarly, we will compensate for unavoidable effects to "Median Stream," the unnamed stream within the I-405 median. We have developed a conceptual stream mitigation plan that includes on-site habitat restoration and creation. The plan includes the following specific elements (See Exhibit 6):

- Connect the new Median Stream culvert under I-90 to the existing channel and wetland located west of SB I-405.
- Create approximately 500 linear feet of stream channel along the western slope of SB I-405.
- Buffer the created stream channel with approximately 16,000 square feet of native streamside vegetation.
- Enhance approximately 300 linear feet of riparian habitat west of SB I-405 by removing selected non-native invasive plant species and replacing with native streamside vegetation.

For more detailed information about mitigation efforts planned in conjunction with the Bellevue Nickel Improvement Project, please refer to the Wetlands and Fisheries and Aquatic Resources discipline reports.

Exhibit 5. Proposed Wetland Mitigation Area

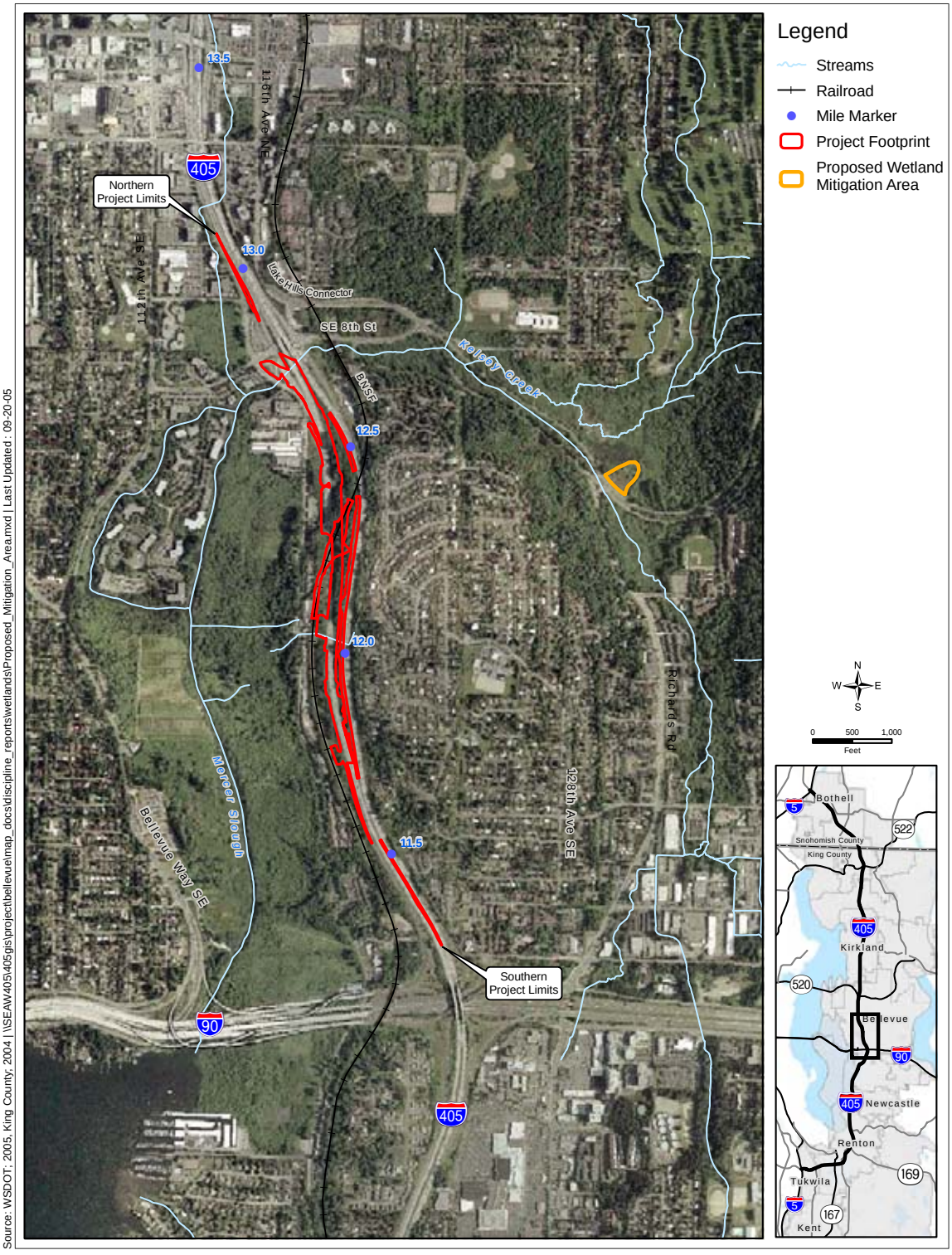
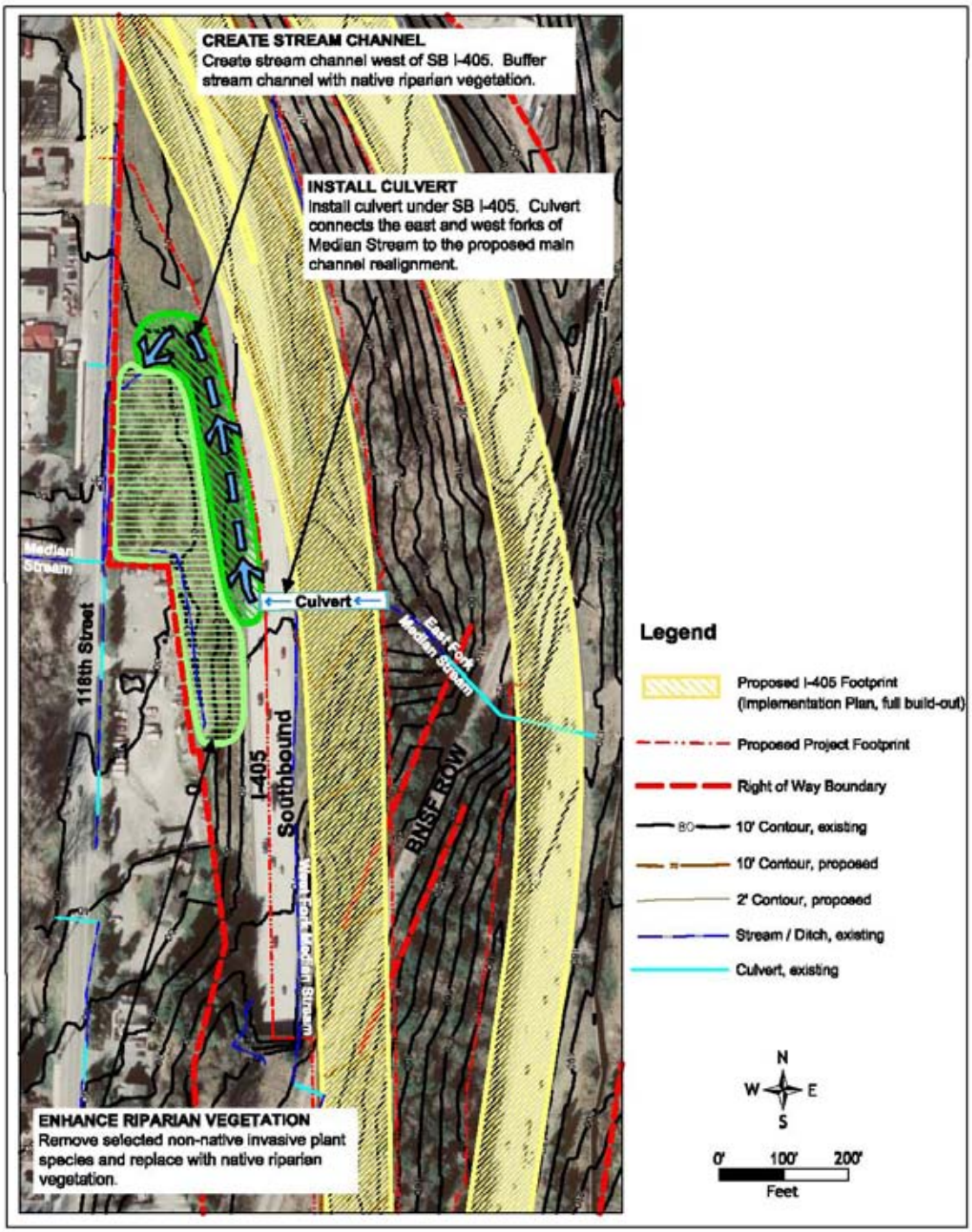


Exhibit 6. Conceptual Stream Mitigation Plan



Why do we consider cumulative effects as we plan this project?

It is important to consider cumulative effects during construction and operation of a project. While cumulative effects may be minor when viewed as individual direct and indirect effects, they can add to the effects of other actions and eventually lead to environmental change.

As defined by the Council on Environmental Quality's (CEQ) regulations implementing the National Environmental Policy Act (NEPA) (40 CFR 1508.7), cumulative effects are:

> "…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."

What is the Code of Federal Regulations (CFR)?

The general and permanent rules published by the federal executive departments and agencies.

It can be difficult to measure and assess cumulative effects because they can be separate from a proposed project in time and location.

Cumulative effects can be positive or negative, depending on which environmental resource we are considering. The same project can negatively affect some resources while positively affecting others.

What are the key points of this report?

This discipline report describes the cumulative effects on air quality, surface water, wetlands, and fish and aquatic habitat resulting from construction and operation of the Bellevue Nickel Improvement Project in combination with other foreseeable projects within 1 mile of the Bellevue Nickel Improvement Project.

The time period for the cumulative effects analysis is from 1960 to 2030.

Based on our analysis, we concluded the following about the Bellevue Nickel Improvement Project's cumulative effects:

Construction

Air Quality – localized, temporary, of low magnitude

Surface Water – localized, temporary, of low magnitude

I-405 plays a critical role in the regional movement of people and freight.

Wetlands – more and higher quality wetland area created or enhanced than filled/permanently affected. Wetland improvements will likely be implemented as part of the Kelsey Creek Park Stream Restoration Project.

Fish and Aquatic Habitat – high probability for positive effect due to improved water quality in areas where treatment facilities will be upgraded and where habitat will be enhanced on site.

Operation

Air Quality – maintain or decrease carbon monoxide (CO) levels; no violation of air quality standards

Surface Water – no decrease in water quality from existing conditions. Enhanced treatment of runoff likely to provide an improvement of water quality.

Wetlands – likely positive effect due to improved water quality discharge to wetlands in some areas.

Fish and Aquatic Habitat – high probability for positive effect due to improved water quality in areas where treatment facilities will be upgraded and where habitat will be enhanced on site.

Background

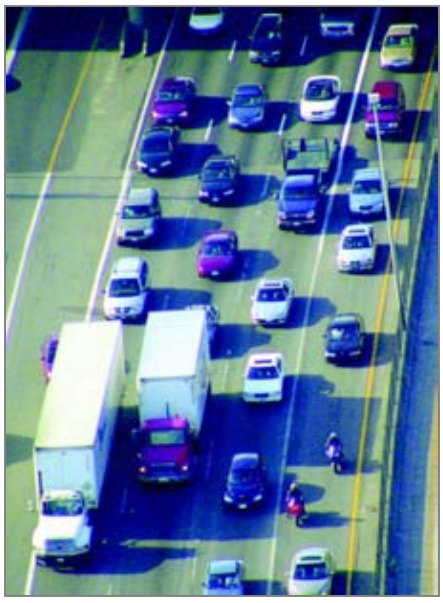
What guidance is available for conducting a cumulative effects analysis?

WSDOT followed guidance from CEQ, FHWA, and from our own manual to analyze and assess the cumulative effects from the Bellevue Nickel Improvement Project. Brief discussions of the CEQ, the FHWA, and the WSDOT guidance follow.

Council on Environmental Quality

Cumulative effects should be evaluated along with the direct and indirect effects of each alternative. The range of alternatives considered should include 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 similar actions that could contribute 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.



Congestion building along the I-405 corridor

- 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. We can identify monitoring programs and/or research to improve the available information and the analyses in the future. Having an ideal database is not necessary for the completion of a CEA..

Cumulative effects can be positive as well as negative, depending on the environmental discipline (e.g., air quality, fisheries, etc.) we are evaluating. It is possible that some environmental disciplines can be negatively and others positively affected by the same proposed project. Analyses such as this one generally identify the extent of beneficial and adverse effects. The nature of the environmental discipline and the specific actions in question also affect the analysis. Because of this potential mixture of effects, it is sometimes difficult to determine which alternative is best.

Federal Highway Administration

What is a Categorical Exclusion?

A category of actions that does not individually or cumulatively have a significant effect on the environment and for which neither an environmental assessment nor an environmental impact statement is required under NEPA.

The FHWA implements the NEPA and the CEQ guidelines through its environmental regulations (23 CFR 771). FHWA regulations, however, do not explicitly address cumulative effects except within the definition of categorical exclusions (CE). This definition addresses potential effects from cumulative CE actions. FHWA policy, provides appropriate direction in dealing with cumulative effects. Guidelines state:

“An appropriately thorough review of the probable direct and indirect impacts 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.”

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, however, is discipline-specific and generally performed for the disciplines directly affected by the action

(such as a transportation project) under study. However, not all of the disciplines directly affected by a project will require a CEA. The environmental resources that are 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 we currently do not provide specific guidance for CEAs, our *Environmental Procedures Manual* refers to the CEQ and FHWA materials. Further, the *Washington State Environmental Policy Act* (SEPA) *Rules* also require cumulative effects to be analyzed (WAC 197-11-792).

What is the relationship of the project to the Metropolitan Transportation Plan (MTP) and other regional actions?

The following sub-sections briefly describe the 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 relate to both the CEA time period and geographic boundaries for the Bellevue Nickel Improvement Project.

Metropolitan Transportation Plan

The Metropolitan Transportation Plan (MTP) was initially adopted in 1995 and includes specific provisions relevant to the I-405 corridor. *Destination 2030*, the 2001 update of the 1995 MTP developed by the Puget Sound Regional Council (PSRC), emphasizes an integrated multi-modal transportation system, describes the major regional components of that system, and acknowledges that capacity enhancements are needed to improve mobility on the 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 in the Puget Sound region. To address these increases, the MTP calls for an aggressive program of transportation investments and indicates that, with those investments, effects on system performance should be relatively minor. *Destination 2030* takes into account the 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 been implementing *Sound Move*, the first phase of the ten-year regional transit long-range vision that includes regional bus service, 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. Except for commuter and light rail facilities, Sound Transit is already implementing a variety of these regional high-capacity transportation (HCT) investments along the I-405 corridor.

Most of the *Sound Move* commitments programmed for the I-405 corridor should be completed by 2006. Sound Transit began Phase II planning in mid-2001 and expects technical work to continue over several years to enable a Phase II public vote. A Phase II public vote is necessary to build a new set of proposed regional HCT improvements beyond 2006.

I-90 Transit Improvements and Lane Additions

The preferred alternative for the I-90 Two-Way Transit and HOV Operations Project will keep the reversible operations in the center roadway, with both lanes operating in the same direction. Single-occupant vehicles will only be allowed to use the center roadway between Seattle and Mercer Island, per the existing restrictions on center roadway use. The outer roadways will be modified to provide one additional travel lane in both the eastbound and westbound direction for use by HOV traffic. This will be accomplished by re-striping, reducing the width of existing shoulders and travel lanes, and where feasible, widening the outer roadways within the existing ROW. The center and outer roadway HOV lanes will likely operate with a restriction of two or more occupants per vehicle. New ramps will be added on Mercer Island at 80th Avenue SE and 77th Avenue SE, and the existing ramp at Bellevue Way will be modified to provide direct access to and from the new HOV lanes in the outer roadway.

State Route 520 Bridge Replacement and HOV Project

WSDOT, Sound Transit, and FHWA are continuing their analysis, documentation, and review of the State Route (SR) 520

Bridge Replacement and HOV Project. WSDOT plans to release the project's Draft EIS (DEIS) in 2006. WSDOT will evaluate several build alternatives (4-lane, 6-lane, and 6-lane with options) and the No Build Alternative in the EIS.

What is the relationship of the Bellevue Nickel Improvement Project to land use, population growth, highways in the region and the I-405 corridor?

In the following subsections, we will briefly describe land use policies and polices addressing population growth. We will consider documents and trends applicable to the region, the I-405 corridor, and the Bellevue Nickel Improvement Project study area and their relationship to transportation infrastructure needs.

Regulatory Trends

During the late 1980s and early 1990s, state, regional, and local governments developed policies, statutes, and regulations that defined the boundaries within which growth would be accommodated and the density that each local jurisdiction would need to achieve over a 20-year horizon. Central to these efforts was the Washington State Growth Management Act (GMA) (RCW 36.70A).

Growth Management Act

The Growth Management Act (GMA) was passed in 1990 and amended in 1991. The GMA addressed the negative consequences of unprecedented population growth and suburban sprawl. The law directed all cities and counties in the state to do some level of planning with more extensive requirements imposed on those counties and cities that are the largest and fastest growing. It defined urban growth areas (UGAs), designated urban centers, established density targets in those urban centers, and identified minimum levels of services for statewide infrastructure. The GMA requirements also included guaranteeing consistency among transportation, capital facilities, and land use plans.

Vision 2020

VISION 2020 describes regional land use patterns consistent with GMA policies. Cities in the I-405 corridor have developed their

comprehensive plans within the framework of *VISION 2020*. *Destination 2030* identifies the regional transportation system needed to support the 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 UGAs defined by each county, establishes a multi-center approach to development that promotes a jobs/housing balance, and plans for needed transportation improvements. The document specifies that improvements should occur at the same time as employment growth to implement the GMA's infrastructure concurrency requirements.

County-Wide Planning Policies

King County, Pierce County, and Snohomish County, working with local cities, took the lead in developing and adopting County-Wide Planning Policies (CWPP). The CWPP integrated land use planning with transportation planning policies. Cities, including the eastside cities (cities east of Lake Washington) within the I-405 study area, adopted the CWPP as one regional implementation tool of the GMA and *VISION 2020*. The CWPP supports the urban center concept. Some urban centers are within the I-405 corridor area. All of the local jurisdictions in the I-405 Corridor Program study area have 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 the 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 a six-year timeframe of any proposed development. The I-405 Corridor Program alternatives support the applicable local transportation plans.

Historical Land Use Changes and Trends

The Puget Sound region has experienced substantial population growth since 1960. As a result of continued growth, the 2000 population of more than three million is projected to reach nearly five million by 2030. Eastside communities that were largely rural in nature in the mid-1900s gradually became rural/suburban and are now suburban/urban. This transformation was facilitated by major transportation infrastructure additions 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 (SR 520); and the construction of I-405 itself. Microsoft and other "high-tech" businesses also played a key role in changes along the I-405 corridor in the mid-1980s and 1990s. Identifiable urban centers (e.g., Bellevue, Kirkland, and Redmond) emerged, increasing pressures on the I-405 corridor to provide the means for moving goods and people.

Land Use Plans and Policies in the Bellevue Nickel Improvement Project Study Area

The State of Washington Local Project Review Act (RCW 36.70B) and the associated state-implementing rules (WAC 365-197) provide a means for local governments to determine consistency of projects with GMA-required comprehensive plans. The GMA contains a goal for each of the following topics:

- Urban Growth
- 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

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 applicable to roads and highways:

- Adopt concurrency regulations to ensure that transportation strategies or improvements are in place at the time of development, or within six years, to meet local level of service (LOS) requirements. Local LOS requirements do not apply to "highways of statewide significance", such as I-405.

For highways of statewide significance, local jurisdictions must evaluate the effects of land use on the state facility as well as 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." Local comprehensive plans must address processes for identifying such facilities and may not preclude their siting.
- Local governments are encouraged to coordinate or consolidate their processes for reviewing the permitting and environmental planning requirements for major transportation projects.

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

The Bellevue Nickel Improvement Project is located within the City of Bellevue. According to the *Land Use Plans and Policies Discipline Report*, the Bellevue Nickel Improvement Project is consistent with the city's plans and policies (WSDOT 2005a). The city's plans and policies support the proposed project improvements. The local applicable policies address inter-jurisdictional cooperation, transit and multimodal systems, compatibility and policies influencing design, and essential public facilities.

The Bellevue Nickel Improvement Project is also consistent with the city's future land use plans for neighborhoods adjacent to I-405, supports or is consistent with planned capital improvements, and will meet LOS standards for affected local arterials and interchanges.

Traffic moving through the existing Wilburton Tunnel

Cumulative Effects on Critical Resources

This chapter discusses the methodology, history, existing conditions, and results of the CEA for the critical resource areas of air quality, surface water, wetlands, and fish and aquatic habitat.

What is the scope of this cumulative effects analysis?

WSDOT defined the scope of the CEA for the Bellevue Nickel Improvement Project by answering the following questions:

What is the relationship between this CEA and the analysis in the I-405 Corridor Program Final EIS?

The CEA in the *I-405 Corridor Program Final EIS* served as a starting point for the Bellevue Nickel Improvement Project CEA. The PSRC reviewed the environmental effects of the I-405 Corridor Program improvements and all other proposed transportation investments in the region in the *Final EIS for Destination 2030, The Metropolitan Transportation Plan for the Central Puget Sound Region* (PSRC 2001). The PSRC re-evaluated the potential cumulative effects of those improvements in the *I-405 Corridor Program Final EIS* in slightly different combinations and together with other transportation improvements, in addition to those presented in *Destination* 2030.

The Bellevue skyline from NB I-405

Which critical environmental resources do we analyze and why?

The I-405 Corridor Program CEA focused on air quality, energy, farmlands, fish and aquatic habitat, surface water, and wetlands. Neither energy nor farmlands are included in the CEA for the Bellevue Nickel Improvement Project. WSDOT determined that farmlands will not be affected at all by the project. We did not analyze energy because we determined that the difference in energy consumption at the regional level, with or without the project, is inconsequential. WSDOT conducted the project-level CEA based on the results of scoping, agency consultations, and the anticipated direct and indirect effects on air quality, surface water, wetlands, and fish and aquatic habitat.

What are the time period and geographic boundaries for this analysis?

When evaluating cumulative effects, we 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.

We define the geographic scope of analysis by the physical limits or boundaries of the Bellevue Nickel Improvement Project's effect on an environmental resource, as well as the boundaries of other activities that may affect 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.

We based the time period and geographic boundaries for the Bellevue Nickel Improvement Project on those used in the *I-405 Corridor Program Final EIS*, on the issues raised during the scoping meetings and agency consultations, and on the area directly affected by the project.

Time Period

We set the time period from 1960 through 2030 for all four environmental resources analyzed. Using 1960 as the starting point for the analysis allowed us to assess the changes that have occurred since the original construction of I-405. The year 2030 is the future year used in the regional transportation planning documents.

Geographic Boundaries

We set the geographic boundary (Exhibit 7) for the project-level air quality analysis at 0.5 mile from the centerline of the project ROW. Using this boundary allowed us to include the effects on air quality of other nearby projects. The *I-405 Corridor Program Final EIS* addressed the effects on air quality for the overall Central Puget Sound Region.

We set the geographic boundaries for the surface water, wetlands, and fish and aquatic habitat analyses to include the portions of Sturtevant Creek and Mercer Slough sub-basins within 1 mile of the study area (Exhibit 8). Expanding the geographic area beyond that of the direct effects area of the Bellevue Nickel Improvement Project allowed us to more comprehensively analyze the cumulative effects on these environmental resources. This geographic area includes the area we evaluated in the biological assessment prepared for the project under the Endangered Species Act, which was within 0.5 mile of the project footprint (WSDOT 2005f).

Exhibit 7. Cumulative Effects Analysis Boundary for Air Quality

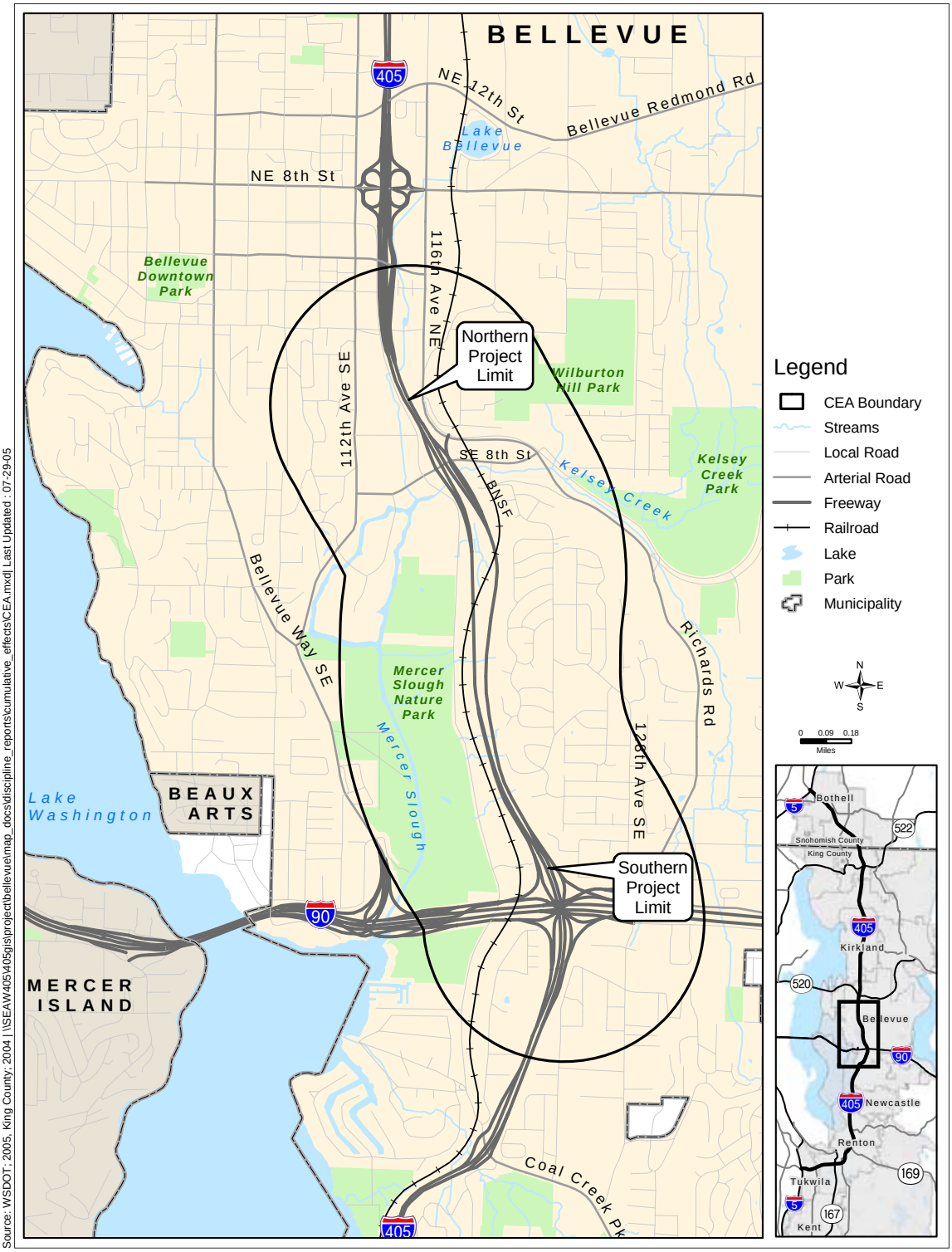


Exhibit 8. Cumulative Effects Analysis Boundaries for Surface Water, Wetlands, and Fish and Aquatic Habitat

Source: WSDOT; 2005, King County; 2004 | \\SEAW405\405gis\project\bellevue\map_docs\discipline_reports\cumulative_effects\CEA.mxd| Last Updated : 07-29-05

Which other projects did we include in the cumulative effects analysis for the Bellevue Nickel Improvement Project and why?

WSDOT included other future nearby projects in the CEA if:

- they were planned, approved, and funded, or likely to receive funding in a relatively short period of time,
- all or a portion of the projects would be located within or immediately adjacent to the Bellevue Nickel Improvement Project study area, and
- the projects would be initiated before 2030.

We evaluated the effects from these projects because they could, in turn, affect the critical resources of the study area. We considered the following projects, depicted in Exhibit 9:

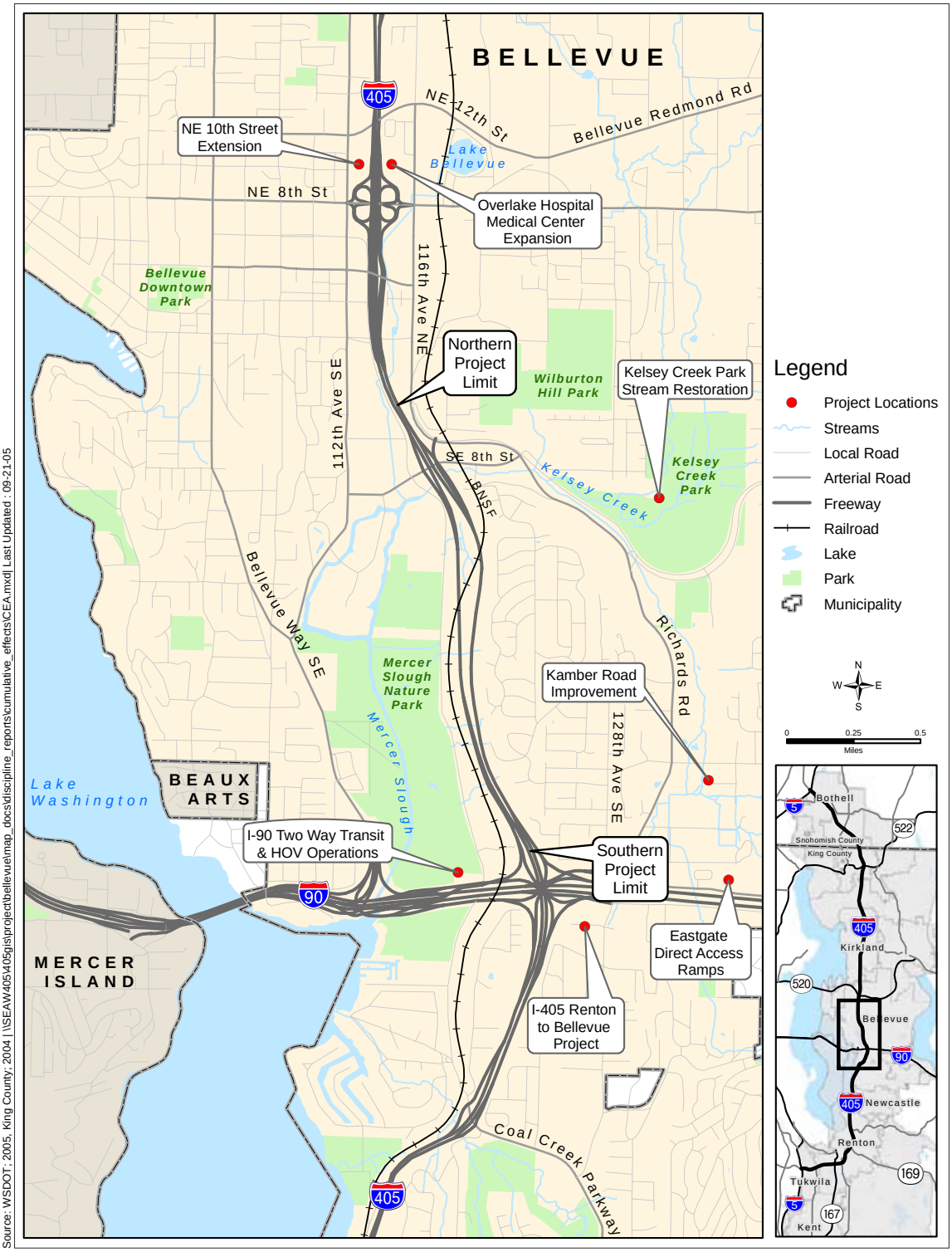
I-405, SR 169 to I-90, Renton to Bellevue Project

This WSDOT project will extend approximately eight miles from SR 169 to the northern ramps of the I-90 interchange. The principal features include:

- two new general-purpose lanes on I-405 in each direction from SR 169 through the I-90 interchange;
- realignment of I-405 to bring it up to current freeway standards where feasible;
- construction of a new in-line transit station in the vicinity of 112th Avenue SE;
- construction of an HOV direct access ramp at N 8th Street in coordination with Sound Transit;
- reconstruction, realignment, and reconfiguration of eight interchanges (SR 169, N 3rd Street, Park Avenue, NE 30th Street, NE 44th Street, 112th Avenue SE, Coal Creek Parkway, and I-90);
- changes to local roadways related to interchange improvements and I-405 widening; and
- stormwater management to provide water quality treatment and discharge.

Construction will likely occur in phases to avoid full road closures. Construction is currently not scheduled.

Exhibit 9. Other Projects Considered in the Cumulative Effects Analysis



Source: WSDOT; 2005, King County; 2004 | \SEAW405\405gis\project\bellevue\map_docs\discipline_reports\cumulative_effects\CEA.mxd| Last Updated : 09-21-05

Overlake Hospital Medical Center/NE 10th Street Extension

The City of Bellevue is planning to extend NE 10th Street from 112th Avenue NE. The extension will cross I-405 and pass through the Overlake Hospital campus to 116th Avenue NE. Improvements will eventually include freeway access ramps to and from SR 520 to the north at the new NE 10th Street overpass, or a new NE 12th Street overpass. This project is a high-priority project and is currently underway.

Overlake Hospital Medical Center Expansion

The Overlake Hospital Medical Center (OHMC), which is located at 1035–116th Avenue NE in Bellevue, will implement a three-year expansion plan. The plan involves the construction of a new five-story patient facility (South Tower) occupying 200,000 square feet just south of the existing hospital. OHMC will also add a six-story 200,000-square-foot medical office building in the northwest section of the campus and a 250,000-square-foot Group Health specialty center. Plans also include a 370-car underground parking area. Construction of the South Tower is underway. The facility is set to open in late 2007. The Group Health specialty center is slated to open in 2008.

I-90 Two Way Transit and HOV Operations

The Cities of Mercer Island, Seattle, and Bellevue; WSDOT, King County, Sound Transit, FHWA, and the Federal Transit Administration are planning road improvements along I-90 between I-5 and I-405. The project will add a fourth lane for buses/carpools on the outer roadways by narrowing the shoulders and traffic lanes, while maintaining the reversible center roadway. Activities will involve roadway re-striping and roadway widening. WSDOT will add new ramps on Mercer Island at 80th Avenue SE and 77th Avenue SE, and will modify the existing ramp at Bellevue Way to provide direct access to and from the new HOV lanes in the outer roadways. Construction is scheduled to begin in 2006 and to be completed in 2008.

Kelsey Creek Park Stream Restoration

The City of Bellevue is planning improvements to a mile-long reach of Kelsey Creek within Kelsey Creek Park to reduce flooding and to improve salmon migration and spawning habitat. The City may also make improvements to the west tributary of Kelsey Creek. Specifically, planned activities may include creating sedimentation ponds, planting trees, restoring abandoned historic channels, installing spawning beds, creating riffle/pool complexes, and dredging portions of the creek to increase flow capacity.

I-90-Eastgate Direct Access Ramps

WSDOT and Sound Transit are constructing transit-only ramps connecting the I-90 HOV lanes to the existing 142nd Place SE bridge. These ramps will provide buses with more direct access to the Eastgate Park-and-Ride. Construction began in March 2005 and is scheduled to be completed by Summer 2006.

Kamber Road Improvement

To improve flow problems at the East Creek crossing between Richards Road and 137th Avenue SE, the City of Bellevue is replacing three culvert pipes with one 33-foot by 75-foot box culvert under Kamber Road. The City is also replacing a damaged sewer section and aged water line. The City is constructing a new sidewalk along the north side of Kamber Road and widening the shoulder for bicycle use. Construction began in June 2005 and was completed September 30, 2005.

How did we determine the cumulative effects?

First, WSDOT identified the direct effects on the critical resources (air, surface water, wetlands, and fish and aquatic habitat) caused by the Bellevue Nickel Improvement Project. We then estimated the indirect effects on the critical resources. We gathered similar information, to the extent it was available, for each of the other projects listed above. Finally, we re-examined the direct and indirect effects to estimate the contribution to cumulative effects on each critical environmental resource resulting from the Bellevue Nickel Improvement Project alone as well as when combined with the other projects included in this CEA.

Air Quality

What regulations apply to air quality and how do they help to limit adverse effects on air quality?

The U.S. Environmental Protection Agency (EPA), Washington State Department of Ecology (Ecology), and the Puget Sound Clean Air Agency (PSCAA) regulate air quality in the study area. Under the Clean Air Act (CAA), the EPA has established National Ambient Air Quality Standards (NAAQS), which specify maximum concentrations for carbon monoxide (CO), particulate matter less than 2.5 micrometers in size ($PM_{2.5}$), ozone, sulfur dioxide, lead, and nitrogen dioxide. Federal funding can be jeopardized for transportation projects that do not conform to the NAAQS.

What is regional conformity?

Under the Clean Air Act, a transportation project may not cause or contribute to an exceedence of the NAAQS. In air quality maintenance areas, regionally significant projects are evaluated for their conformity to Air Quality Maintenance Plans. Projects that conform to the plan are not expected to cause exceedence of the standard.

In the Puget Sound Region, the PSRC determines regional conformity by including a project in the Metropolitan Transportation Plan (MTP) and the Transportation Improvement Plan (TIP).

Transportation conformity ensures that transportation activities (e.g., 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 violations, worsen existing conditions, or interfere with the timely compliance of air quality standards or the required scheduled emissions reductions toward attainment. All jurisdictions and agencies that implement transportation plans, programs, and projects in the central Puget Sound region need to participate collectively to attain regional conformity (PSRC 2004).

Transportation plans must provide for the timely implementation of Transportation Control Measures (TCMs) from an approved maintenance plan. TCMs are projects, programs, and actions that aid in reducing or eliminating the severity or number of violations of the NAAQS, and help to expeditiously comply and maintain those standards. TCMs can lead to measurable vehicle emission reductions by increasing the efficiency of existing transportation facilities, reducing travel demand, or lowering the amount of vehicle emissions. Expected emissions reductions or credits from the TCMs are included in the maintenance plan inventories and attainment/maintenance demonstrations (PSRC 2004).

A State Implementation Plan (SIP) is required under the CAA to provide a blueprint of how maintenance and non-attainment areas will meet the NAAQS. The CAA, the Transportation Equity Act for the 21st Century (TEA-21), and the Clean Air Washington Act (CAWA) require conformity to enable the

central Puget Sound region to proceed with implementing its transportation projects in a timely manner (PSRC 2004).

The I-405 corridor lies within ozone and CO maintenance areas. Air quality emissions in the Puget Sound region are currently managed under the provisions of Air Quality Maintenance Plans (AQMP) for ozone and CO. The PSCAA and Ecology developed current plans, which the EPA approved in 1996 (WSDOT 2005b).

What are maintenance areas?

Air quality maintenance areas are regions that have recently attained compliance with the National Ambient Air Quality Standards.

What are air quality maintenance plans (AQMP)?

Any regionally significant transportation project in the Puget Sound air quality maintenance areas must conform to the federal AQMPs.

What has been the trend in Central Puget Sound air quality?

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

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

Because travel demand has exceeded roadway and transit network capacities, congestion on all highways, including I-405, has continued to worsen. Transportation improvements, such as the Bellevue Nickel Improvement Project, will help to lessen congestion and, thereby, improve air quality.

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

How will the Build Alternative affect air quality?

Construction

Direct Effects

WSDOT expects the Bellevue Nickel Improvement Project to produce temporary effects on air quality typical of large roadway projects. These effects could include: increases in particulate emissions, depending on the level and type of activity, soil characteristics, weather, and equipment used; CO and nitrogen oxides from construction equipment powered by gasoline and diesel engines; increases in CO and nitrogen oxide levels due to vehicles delayed while traveling through the work areas; fugitive dust; and, odors associated with the use of asphalt.

Indirect Effects

We do not anticipate any measurable indirect effects associated with changes in air quality due to the construction of the Bellevue Nickel Improvement Project.

Cumulative Effects

With mitigation measures in place and followed, we expect construction-related cumulative effects on air quality contributed by the Bellevue Nickel Improvement Project and the other projects included in this CEA, to be localized, temporary, and of low magnitude. This is due to the distance between the projects and their respective schedules, duration, characteristics, and size.

Operation

Direct Effects

We anticipate neither an increase in traffic volumes at any intersection nor a change in the configuration of any intersection. As a result, there will likely be no detectable localized change in air quality between the Build Alternative and the No Build Alternative (WSDOT 2005b).

Indirect Effects

Because we have determined that localized changes in air quality resulting from the Bellevue Nickel Improvement Project will likely not be detectable, we anticipate indirect effects will also not be detectable.

Cumulative Effects

The Bellevue Nickel Improvement Project will add capacity to I-405 and, as a result, decrease congestion and improve traffic flow. The project will neither cause nor contribute to a violation of the NAAQS for CO from both a project-specific, as well as a cumulative standpoint. The other HOV and transit projects analyzed in this CEA should also help to reduce automobile use, improve efficiency of the transportation system, and decrease CO levels from existing conditions in parts of the study area. The operational phases of the Overlake Hospital Medical Center Expansion, the Kelsey Creek Park Stream Restoration, and the Kamber Road Improvement project will not affect air quality.

How would the No Build Alternative affect air quality?

The Bellevue Nickel Improvement Project would not produce any construction-related effects on air quality under the No Build Alternative.

The No Build Alternative would not provide any relief to traffic congestion in the study area. Consequently, the No Build Alternative may cause an increased rate of air quality degradation in the study area.

Assuming the other HOV and transit projects analyzed in this CEA would be constructed, they would still help to reduce automobile use, improve efficiency of the transportation system, and decrease CO levels from existing conditions. The operational phases of the Overlake Hospital Medical Center Expansion, the Kelsey Creek Park Stream Restoration, and the Kamber Road Improvement project would not affect air quality.

Surface Water

Which watersheds and streams will the project potentially affect?

The Bellevue Nickel Improvement Project is located entirely in the Kelsey Creek Sub-area of the Lake Washington Watershed (WRIA 8). WRIA 8 is located predominantly within the borders of King County. It is bounded by Puget Sound on the west, while to the east, the headwaters of the Cedar River reach the crest of the Cascade Range near Stampede Pass. The northern and southern boundaries follow hilltops, ridges, and plateaus that

What is a water resource inventory area (WRIA)?

A Water Resource Inventory Area (WRIA) may include more than one watershed. Washington State is divided into 62 WRIAs for water and aquatic resource management issues.

define the drainage divides between the Snohomish/Snoqualmie (WRIA 7) and Green/Duwamish (WRIA 9) watersheds, respectively.

The Kelsey Creek watershed is 10,870 acres in size and comprises several streams, all of which drain in a westerly direction into Mercer Slough before entering the East Channel of Lake Washington near I-90. The tributaries of Lake Washington are among the most altered hydrological streams in the Puget Sound Region. These streams rely on rainfall and groundwater, rather than snow pack, and exist in heavily urbanized settings. The stream drainage areas generally have high percentages of impervious surfaces, altered hydrologic regimes, loss of floodplain connectivity, poor streamside conditions, and water quality problems (Kerwin 2001).

The streams in the Bellevue Nickel Improvement Project study area have been highly altered from their natural state to accommodate residential, commercial, and industrial land uses. This alteration has included bank hardening, such as installing riprap and placing streams in concrete channels; reducing or removing stream-side vegetation; straightening stream channels; and removing in-stream habitat. These alterations have also resulted in loss of the historic floodplains associated with most of these waterbodies. Substantial changes have also occurred in the vegetation surrounding these waterbodies. Predominantly mature native vegetation has been replaced by a mix of immature native vegetation and non-native invasive plant species.

The streams in WRIA 8 that are crossed by I-405 or are otherwise in the vicinity of the Bellevue Nickel study area include three unnamed tributaries to the Mercer Slough wetlands, Trail Creek, an unnamed stream in the I-405 median, Kelsey Creek, Sturtevant Creek, and Mercer Slough (Exhibit 10).

What are non-native invasive plant species?

Non-native invasive plant species are plant species that do not naturally grow in a particular area, but thrive once introduced. These plants are characteristically adaptable, aggressive, and have a high reproductive capacity. Their vigor, combined with a lack of natural enemies, often leads to outbreak populations.

A **watershed** or **catchment basin** is the region of land that drains into a specified 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.

Typical stream channel of the first unnamed tributary to Mercer Slough Wetlands

Unnamed Tributaries to Mercer Slough Wetlands

The unnamed tributaries to the Mercer Slough wetlands are located to the west of both the project footprint and the Burlington Northern Santa Fe Railway (BNSF) ROW. None of the downstream sections of these streams is immediately adjacent to the project footprint; however, some of the streams receive stormwater runoff from I-405.

Exhibit 10. Waterbodies in Study Area

First Unnamed Tributary

The first unnamed tributary to the Mercer Slough wetlands originates from a natural depression located on the east side of the I-405 northbound sound wall.

No distinct drainage channel exists in the depression. Surface stormwater collects in the depression and drains through a series of culverts under I-405 and the BNSF ROW to an open stream channel that is bounded on the north by the BNSF ROW, the south by 118th Avenue SE, and the east and west by residential developments. After the tributary passes under 118th Avenue SE, it flows for approximately 50 feet in an open stream channel located in the Mercer Slough Nature Park where the stream channel then disappears and the water flows into the ground. There is no distinct stream channel beyond this point. This stream does not presently receive runoff from I-405, nor will stormwater be directed into this stream as part of the project.

Second Unnamed Tributary

The second unnamed tributary originates from both a residential drainage system and an intermittent stream channel, which are located to the east of the project footprint. It then flows through a series of culverts under I-405, the BNSF ROW, and 118th Avenue SE to a stormwater pond on the west side of 118th Avenue SE. This pond discharges to Mercer Slough Nature Park. This stream neither presently receives runoff from I-405, nor will stormwater be directed into this stream as part of the project.

Looking downstream at the dry channel of the third unnamed tributary to Mercer Slough Wetlands

Third Unnamed Tributary

The third unnamed tributary originates from flow from two catch basins: one collecting residential drainage east of the I-405 northbound sound wall and the second collecting stormwater from the I-405 northbound lane. Flow from the catch basins converges into a single catch basin, which drains under I-405 and the BNSF ROW to an open stream channel. After the tributary passes under 118th Avenue SE, it flows in an open stream channel through Mercer Slough Nature Park for approximately 300 feet to where the channel ends and flow disperses into a portion of the Mercer Slough wetlands.

Trail Creek

The upstream end of Trail Creek originates from a culvert under 121st Avenue SE. Trail Creek then flows into an open channel until it enters a catch basin located to the east of the I-405 northbound sound wall. This catch basin is connected to a series of culverts and catch basins that collect freeway runoff from both the northbound and southbound lanes of I-405. These culverts ultimately converge and discharge into Mercer Slough Nature Park. Trail Creek then flows westerly approximately 1,000 feet until it fans out into a wetland complex. From there it enters the Mercer Slough wetlands, ultimately reaching Mercer Slough.

Unnamed Stream in I-405 Median

Median Stream originates from two separate locations: the I-405 southbound lane and a hillside seep (wetland) east of the I-405 northbound lane. The west fork of the stream originates from a series of catch basins along the east side of the I-405 southbound lane. The east fork of the stream originates from a residential drainage area located east of the I-405 northbound lane sound wall, flows through a culvert underneath the BNSF ROW, and daylights immediately west of the BNSF ROW. There are no natural stream channels upstream of either fork of Median Stream. The two forks converge into a single stream channel that flows northerly until it is intercepted by two catch basins in the streambed that carry the flow across the southbound lanes of I-405.

Beaver dam and associated pool in Median Stream located immediately west of I-405

Median Stream daylights again into an open channel on the west side of the I-405 southbound lane. A beaver dam bridges the stream approximately 20 feet downstream of where the creek daylights. The stream then flows southerly through a second wetland complex and then westerly under 118th Avenue SE and into the Mercer Slough wetlands.

Kelsey Creek

From the hillside to the east of I-405, Kelsey Creek flows westerly to where it enters a large culvert at the I-405 southbound off-ramp from SE 8th Street. Kelsey Creek then flows under I-405 and outlets into Mercer Slough via a culvert and associated fish ladder to the west of 118th Avenue SE. A second flood overflow culvert is located immediately north of the main channel culvert.

Looking upstream at Kelsey Creek main channel

Sturtevant Creek

Sturtevant Creek originates from Lake Bellevue and flows into an open channel constrained between a parking lot for Lake Bellevue businesses and the BNSF ROW. From there, Sturtevant Creek flows alternately between open-channel and culverted segments until it crosses under I-405 via two side-by-side concrete culverts. At this point, Sturtevant Creek daylights and flows southerly into a series of open channel segments interrupted by culverted sections and one area where the creek flows underneath a building. Once past the building, Sturtevant Creek flows through a culvert under SE 6th Street to where it enters a large wetland complex associated with Mercer Slough. The creek continues under SE 8th Street, eventually discharging into Mercer Slough.

Mercer Slough

Mercer Slough is the largest contiguous wetland (367 acres) connected to Lake Washington. Situated in a broad wetland-receiving basin that drains south into Lake Washington, Mercer Slough was once a shallow inlet before the lake was lowered in 1916. The major tributaries to Mercer Slough include Kelsey, Richards, Valley, Sturtevant, and Coal creeks.

How has development affected surface water?

What is forest duff?

Forest litter and other organic debris in various stages of decomposition on top of the mineral soil; typical of conifer forests in cool climates where the rate of decomposition is slow and litter accumulation exceeds decay.

Development of natural landscapes radically alters the natural drainage processes. In a natural forested landscape, vegetation, forest duff and the upper soil horizons 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 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, increasing 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.

All of these changes, hydrologic effects as well as reduced water quality, tend to decrease the habitat value of streams. Nutrients

in surface water, such as those from fertilizers, can lower the amount of dissolved oxygen available to aquatic life. Turbidity can harm fish and aquatic insects. Removing the particles that cause turbidity is the primary strategy of many stormwater treatment systems.

The Mercer Creek sub-basin is 8,723 acres and includes approximately 25 percent impervious surface area. Within the Mercer Creek sub-basin, three drainage areas intersect the Bellevue Nickel Improvement Project. The southern drainage is the 1,375-acre Mercer Slough sub-basin that is 35 percent impervious. The Kelsey Creek sub-basin is 7,680 acres and is 28 percent impervious. The northern portion of the project is located in the highly developed Sturtevant Creek sub-basin, which comprises 442 acres and is 75 percent impervious (WSDOT 2005c).

What is the quality of surface waterbodies in the study area?

Federal, state, and local authorities regulate surface water quality to maintain a variety of beneficial uses including fish and wildlife habitat, drinking water, irrigation water, recreation, and aesthetic values. Ecology regulates water quality and has established water quality standards for temperature, dissolved oxygen (DO), stream flow, and a wide variety of polluting substances in surface water.

Kelsey Creek

King County has monitored water quality at the mouth of Kelsey Creek since 1976. In the 5-year period from 1998 to 2003, King County found relatively low turbidity and improved nutrient conditions compared to conditions prior to 1998. However, the County also observed degradation in other water quality conditions in Kelsey Creek over the same period. Between 1979 and 1999, Kelsey Creek increased in pH, conductivity, and temperature. Temperature and pH occasionally exceeded state water quality standards between 1998 and 2003 (King County 2004).

Kelsey Creek is on the Washington State list of water quality impaired surface waters (303d[d] list) due to temperature, dissolved oxygen, and fecal coliform bacteria (Ecology 2005b). DDT, dieldrin, fecal coliform, and heptachlor epoxide concentrations recorded in 1979 and 1980 caused Kelsey Creek to be listed (Ecology 1998). DDT, dieldrin, and heptachlor are

insecticides that have been used historically in residential and agricultural applications. (Heptachlor epoxide is a compound that forms when heptachlor oxidizes in the environment). Although the government has banned use of these insecticides, some residues may persist in the environment for many years. Fecal coliform bacteria can come from a variety of sources, including waterfowl, domestic pets, or failed septic or sewer systems.

Nutrient concentrations affect DO concentration and it is inversely related to temperature. King County observed DO below state standards in 14 percent of baseflow samples taken at the mouth of Kelsey Creek between 1998 and 2003. Bacterial counts during this period frequently exceeded state standards in baseflow samples and exceeded state standards in 100 percent of stormflow samples. Nutrient (nitrogen and phosphorus) concentrations in Kelsey Creek have improved since 1979 but remain higher than the median concentration for selected King County stream sites (King County 2004).

In 1998, the United States Geological Survey (USGS) reported that stream sediment from the west fork of Kelsey Creek (upstream from the study area) had the highest concentration of polycyclic aromatic hydrocarbons (PAHs) of the 18 Puget Sound streams included in its study. One of these compounds, benzo(a)pyrene was present in concentrations high enough to cause pre-cancerous tumors in fish (under laboratory conditions). Sources of PAHs may include residues from forest fires, fossil fuel sources such as oil spills, or byproducts of coal tar and asphalt manufacturing (MacCoy and Black 1998). Creosote, long used as a wood preservative for railroad trestles and ties, and other outdoor structural timbers contain PAHs. The source or sources of PAH pollution in Kelsey Creek have not been identified, however.

The high temperatures, low dissolved oxygen, nutrient concentrations, and bacterial pollution in Kelsey Creek are fairly typical of urban streams with altered hydrology and runoff from residential properties and impervious surfaces. Considering the highly developed condition of the drainage basin, it is likely that temperature will continue to exceed water quality standards on occasion in the future.

Mercer Slough

Mercer Slough is on the state 303(d) list for temperature, DO, and fecal coliform bacteria (Ecology 2005b). Dissolved oxygen depletion is fairly common in streams such as Mercer Slough

that are slow moving and have dense growth of submerged vegetation or algae.

Although highway runoff contributes to the pollutant load of Mercer Slough (and study area tributaries), highway runoff is a relatively small fraction of the total pollutant load of Mercer Slough.

Sturtevant Creek

The City of Bellevue has sampled Sturtevant Creek in the past and has reported relatively high suspended solids, turbidity, oils, greases, petroleum hydrocarbons, and chemical oxygen demand compared to other Bellevue streams (City of Bellevue 2003). These substances are high in Sturtevant Creek because of the large proportion of this sub-basin that is industrial or roadway surfaces.

What is the history of stormwater regulation?

By the 1970s, local municipalities recognized that some form of stormwater management was needed for new developments and stormwater utilities were established. Agencies developed and implemented BMPs for the control of stormwater runoff and required stormwater utilities for certain projects. In the late 1980s, the Puget Sound Water Quality Authority published its *Puget Sound Water Quality Management Plan*. The early 1990s brought the issuance of King County's *Surface Water Design Manual*, WSDOT's *Highway Runoff Manual*, and Ecology's *Stormwater Management Manual for the Puget Sound Basin*. Stormwater detention and water quality treatment became mandatory for all projects within areas draining to Puget Sound. Statutes (e.g., the Clean Water Act (CWA), GMA, and the Shoreline Management Act (SMA)) and their associated implementing regulations have provided additional guidance. Project design standards require 100 percent of new impervious surfaces to be treated and the two-year through 50-year storm events to be detained.

How is stormwater currently managed in the study area?

Stormwater from most of the study area is not currently detained or treated. A detention pond in the southwest quadrant of the I-405/SE 8th Street interchange treats two acres of impervious surface area in the vicinity of SE 8th Street. Otherwise, storm

sewers discharge untreated runoff into streams, wetlands, and ditches west of I-405.

How will the Build Alternative affect surface water?

Construction

Direct Effects

Construction of the Bellevue Nickel Improvement Project could result in increased runoff volumes and peak flows of surface waters. However, WSDOT will construct the Build Alternative per federal and state technical guidance, permit conditions, and WSDOT project specifications that will require the use of BMPs to control and/or retain runoff. We have determined that these effects, should they occur, will be minimal, localized, and short-term.

Indirect Effects

Increased runoff and peak flows during construction could potentially adversely affect water quality by increasing the total suspended solids (TSS) in receiving waters. The decreased water quality could negatively affect fish and organisms living in the waters. Should they occur, however, we have determined that the effects will be minimal, localized, and short-term.

Cumulative Effects

WSDOT will minimize the cumulative effects of the project on surface waters by applying BMPs and complying with regulatory requirements and permit conditions (e.g. National Pollutant Discharge Elimination System (NPDES) Construction Stormwater Permit). We assume that similar mitigation measures will be followed, where appropriate, for the other projects considered in this CEA. As a result, construction-related cumulative effects on surface waters attributable to those projects and the Bellevue Nickel Improvement Project should be temporary and of low magnitude.

Operation

Direct Effects

The Bellevue Nickel Improvement Project will add approximately 10.3 acres of new impervious highway surface. Highway runoff will be treated by applying both quality and flow control BMPs so that stormwater discharges will not exceed

water quality and peak discharge criteria required by state and local authorities. Because the Bellevue Nickel Improvement Project will treat 117 percent of the new impervious surface area, the quality of the surface water discharges from the study area should improve compared to current conditions.

Indirect Effects

We believe that indirect effects related to the Bellevue Nickel Improvement Project resulting from changes in surface flows and water quality will likely be difficult to measure. Groundwater hydrology could be altered due to the increased impervious surface area. However, the total increase in impervious surfaces due to the project is small in comparison to the recharge area of approximately 11,000 acres for Kelsey Creek. Therefore, the magnitude of the effects will be small. Moreover, there are no designated critical recharge areas within the study area.

Cumulative Effects

Operation of the Bellevue Nickel Improvement Project will not adversely affect surface waters. Enhanced treatment of runoff and treatment of 117 percent of the new impervious surface area will likely contribute to improved water quality in the study area. The Renton-to-Bellevue Project will contribute to improved water quality as a result of retrofitting 162 acres of existing impervious surface area with new water quality treatment facilities. The other projects included in this CEA will, at a minimum, be required to comply with state and local surface water management requirements. This should prevent negative cumulative effects to surface waters. To the extent those projects also provide enhanced and/or retrofitted treatment, we expect surface water quality to improve.

How will the No Build Alternative affect surface water?

The No Build Alternative of the Bellevue Nickel Improvement Project would not produce any construction-related effects on surface waters.

Currently, some surface waters in the study area receive untreated runoff from stormwater facilities that do not meet current treatment levels. 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 Bellevue Nickel Improvement Project would not occur.

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

Wetlands

What has happened to the study area wetlands over time?

What is Adaptive Management?

A scientific policy intended to improve management of biological resources—particularly in areas of scientific uncertainty. Program actions and results are monitored and evaluated. Program actions are then adjusted, if needed, to achieve the desired results.

Wetland resources in the watershed have continued to decline over time due to the construction of homes, retail centers, and industrial facilities and the loss of natural landscapes associated with increases in human population. While environmental awareness has increased due to the passage of legislation, the number, size, and function of wetlands has continued to decline. However, the rate of decline has decreased and will likely continue to do so. The goal of *No Net Loss* (at least as many acres of wetlands created as lost/filled), combined with improved avoidance, mitigation, and compensation measures, is helping to restore wetland areas. Advanced research, refined regulatory requirements and programs, and the use of adaptive management procedures all further enhance the restoration trend.

How are effects on wetlands regulated?

Numerous federal, state, and local laws, regulations, ordinances, and orders now govern activities in or near wetlands. That was not the case in 1960. The passage of the NEPA in 1969 required project proponents to evaluate the 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 complies with that mandate during the planning, construction, and operational phases of transportation facilities and projects (DOT Order 5660.1A). Additionally, legislation at the state level, such as SEPA and the GMA, as well as local ordinances, now regulate wetlands. These local ordinances governing wetlands and other sensitive/critical areas continue to evolve. In general, required mitigation and compensatory measures have become more stringent.

Where are the wetlands in the study area and what are their characteristics?

WSDOT delineated five wetlands (totaling approximately 2.7 acres) in the Mercer Slough sub-basin and four wetlands (totaling approximately 0.7 acre) in the Kelsey Creek sub-basin. The wetlands are shown in Exhibit 11.

Mercer Slough Sub-Basin

Wetlands in the Mercer Slough sub-basin receive water from hillside seeps, Kelsey Creek, surface water drainage, and groundwater. Several of the wetlands are roadside ditches dominated by bentgrass, velvetgrass, and soft rush. These wetlands receive road runoff and typically discharge to a catch basin or culvert.

Three of the five wetlands in the Mercer Slough sub-basin are forested. Wetland 11.4L is less than 0.1 acre and contains a forested topographic depression dominated by black cottonwood and Oregon ash. Wetland 12.4 L is an approximately 0.9-acre depressional wetland located between I-405 and 118th Avenue SE. This wetland is dominated by willow and red alder but also contains reed canarygrass. It discharges to Mercer Slough through a culvert under 118th Avenue SE. Wetland 12.45M is located in the median north of the Wilburton Tunnel. This 1.7-acre riparian and hillside seep wetland is associated with an unnamed stream that enters the median through a culvert under the northbound lanes and the BNSF railroad. It is dominated by willow, red alder, blackberry, and reed canarygrass (WSDOT 2005d).

Kelsey Creek Sub-Basin

The four wetlands in the Kelsey Creek sub-basin receive water from the creek and its tributaries, surface water, and groundwater. All of the wetlands in the Kelsey Creek drainage are emergent wetlands dominated by reed canarygrass, soft rush, and bentgrass with some alder, willow, and blackberry. Three of the wetlands are ditch-associated and convey stormwater runoff. Wetland 13.1L is a narrow riparian wetland associated with Sturtevant Creek that is regularly maintained and mowed (WSDOT 2005d).

Exhibit 11. Wetlands in Study Area

Source: WSDOT; 2005, King County; 2004 | \SEAW405\405gis\project\bellevue\map_docs\discipline_reports\cumulative_effects\CEA.mxd| Last Updated : 07-29-05

What are the classifications of the wetlands in the study area?

WSDOT used two primary tools to evaluate the wetlands. The first tool is the *Washington State Wetland Rating System for Western Washington – Revised* (Hruby 2004). We categorized six of the nine wetlands that occur in the study area as Category IV wetlands, two as Category III, and one as Category II. No Category I wetlands occur within the study area.

Local governments have also created systems for rating wetlands that allow them to prioritize wetland protection. The local rating system is typically based on the state rating system but also considers some criteria specific to that jurisdiction, such as rarity of certain wetlands within the local area.

The City of Bellevue has its own sensitive areas ordinance that includes a wetland classification system. Using the Bellevue Environmentally Sensitive Areas code, the WSDOT classified five of the wetlands in the study area as Type C and four as Type B because they were greater than 7,200 square feet in size. None were classified as Type A (WSDOT 2005d).

What are the wetland categories based on function?

I – Provide a high level of functions and values.

II – Provide habitat for sensitive or important plant and wildlife species and a high level of functions.

III – Provide a moderate level of functions and values.

IV – Provide low level of functions and values, have been heavily disturbed, and typically consist of non-native invasive plant species.

What are the City of Bellevue wetland types?

A – Adjacent to, include, or hydrologically related to Type A or B streamside corridor.

B – Exceed 7200 square feet and do not include, or are not adjacent to or hydrologically related to Type A or B streamside corridor.

C – Same as B but less than 7200 square feet.

What functions and values do study area wetlands provide?

WSDOT evaluated the study area wetlands for functions and values using the WSDOT *Wetland Functions Characterization Tool for Linear Projects* (Null et al. 2000). Seven of the nine wetlands within the entire study area are relatively small (less than one-third of an acre). The two largest wetlands are located in the Mercer Slough sub-basin and are approximately 0.9 acre and 1.7 acres in size. None of the wetlands in the Kelsey Creek sub-basin are larger than one-third of an acre.

The entire study area is located within the UGA and within existing road ROW. All of the wetlands within the study area have been disturbed to some extent by development, including the original construction of I-405 and commercial or residential development in the surrounding area. Consequently, the wetlands are compromised in their ability to provide full functions and values.

We found seven of the nine wetlands to have the potential to provide valuable stormwater management functions including flood flow alteration, sediment removal, nutrient and toxicant removal, and erosion control. Four wetlands are likely to provide value related to general habitat, habitat for amphibians,

wetland-associated mammals and/or wetland-associated birds, or native plant richness. The wetland (13.1L) adjacent to Sturtevant Creek is likely to provide general value as fish habitat. Wetlands 12.4L and 12.45M are likely to provide native plant richness. None of the wetlands are likely to provide uniqueness and heritage value. The wetlands in the study area are either not publicly owned or in WSDOT ROW, which limits their education and recreational uses (WSDOT 2005d).

How will the Build Alternative affect wetlands?

Construction

Direct Effects

Construction of the Bellevue Nickel Improvement Project will require work in and adjacent to wetlands and wetland buffers. Portions of three wetlands identified within the study area, totaling approximately 1 acre, will be permanently filled. Two of these are small Category IV wetlands. The third wetland, to be partially filled, is a Category III wetland. All three wetlands are located within the roadway median.

Additionally, approximately 0.18 acre of wetlands will be temporarily disturbed, resulting in a short-term reduction or loss of wetland functions. In those cases, WSDOT will restore the wetlands following completion of construction activities. Restoration will include replanting with appropriate vegetation. A project-specific restoration plan will guide those activities.

Indirect Effects

Although we will permanently fill under 1 acre of wetlands to build the Bellevue Nickel Improvement Project, we do not anticipate any detectable indirect effects due to the affected wetlands' small sizes, reduced functions, and locations in the median.

Cumulative Effects

Based on the mitigation to compensate for the loss of approximately 1 acre, cumulative effects to wetlands due to the Bellevue Nickel Improvement Project will be positive. Roughly 1.1 acres of higher quality wetland and water quality functions will be created. Although WSDOT has yet to finalize details regarding the mitigation, our compensatory actions for the affected wetlands may occur in Kelsey Creek Park.

Additionally, the Renton to Bellevue and I-90 Two-Way Transit and HOV Operations Projects will affect wetlands. These two projects will also create or enhance more acres of wetlands than are filled or permanently lost. Both may utilize mitigation credits associated with sites like Kelsey Creek Park . The Renton to Bellevue Project will likely use the Springbrook Creek Wetland and Habitat Mitigation Bank in Renton.

The mitigation sites will provide safe, high-quality wildlife habitats away from the dangers of a roadside location.

Operation

Direct Effects

Some wetlands that exist within the ROW are currently affected by vegetation and stormwater maintenance activities. Wetland areas remaining within the ROW after construction of the project will likely continue to be affected by such activities (i.e. mowing). WSDOT's planned stormwater management measures (enhanced treatment of 117 percent of new impervious surface area) should improve the water quality in both wetlands within the ROW and those receiving stormwater discharge from the new impervious surfaces.

Indirect Effects

WSDOT does not anticipate any measurable indirect effects associated with the direct effects to wetlands during the operation of the Bellevue Nickel Improvement Project. This is because the wetlands that will be directly affected are located within the ROW and are of low value (quality).

Cumulative Effects

Operation of the Bellevue Nickel Improvement Project will likely positively contribute to wetlands. Further, enhanced and created wetland habitat will be a key objective at the Kelsey Creek Park mitigation site.

Operation of the Renton to Bellevue Project may have a positive cumulative effect on wetlands receiving runoff due to the project's retrofitting of water quality treatment for 162 acres of presently untreated impervious surface, as well as enhanced treatment of discharges from new impervious surfaces.

How would the No Build Alternative affect wetlands?

No construction would occur for the No Build Alternative; therefore, no wetlands or their buffers would be affected. Some wetlands in the project 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, wetlands that occur within the I-405 ROW would likely continue to be affected by stormwater system maintenance activities and mowing.

Improvements and enhancements associated with the Bellevue Nickel Improvement Project would not occur.

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

Fish and Aquatic Habitat

What are the characteristics of the study area's aquatic habitat?

Over time, development for residential, commercial and industrial land uses has highly altered the natural state of streams. This alteration has included bank hardening, placing streams in culverts, reducing or removing streamside vegetation, straightening stream channels, and removing in-stream habitat. These alterations have reduced the area of historic floodplains associated with most of the waterbodies. Substantial changes have also occurred in the vegetation surrounding the waterbodies: a mix of immature native vegetation and non-native invasive plant species has replaced what was once predominantly mature native vegetation. We collected information on the streams in the study area by researching existing information, and conducting personal interviews and habitat surveys. The habitat characteristics for the waterbodies listed below are specific to those portions of the waterbodies located within 300 feet upstream and 0.25 mile downstream of the study area footprint.

Three Unnamed Tributaries to Mercer Slough Wetlands

The open channel section of the first unnamed tributary between the BNSF ROW and 118th Avenue SE is approximately 175 feet

long with an average slope of roughly 8 percent. Riffles are the predominant in-stream habitat type in this reach, though the upstream end of the creek flows through a wetland for approximately 40 feet before entering a defined stream channel. Available fish cover includes overhanging vegetation, macrophytes, small wood and brush, and large woody debris (LWD). The upper canopy of this reach is a mix of small and large coniferous-deciduous trees. The streambed substrate is composed of fine sediment (WSDOT 2005e).

The second unnamed tributary largely flows through culverts and does not provide fish habitat.

The open channel section of the third unnamed tributary between the BNSF ROW and 118th Avenue SE is approximately 150 feet long with an average slope of roughly 11 percent. This reach was dry when surveyed. The upper canopy of this reach is a mix of small and large deciduous trees. The streambed substrate is a mixture of course gravel and cobbles (WSDOT 2005e).

Trail Creek

The upstream reach of Trail Creek (up to about 500 feet east of I-405) is contained within a well-defined channel throughout most of its length and has an average slope of approximately 5 percent. Here, riffles are the predominant in-stream habitat type. We identified one low quality pool formed by an approximately three-foot-high waterfall. Fish cover includes small wood and brush, and overhanging vegetation. The upper canopy of this reach comprises small and large deciduous trees. The streambed substrate is mainly cobble-sized material.

The downstream end of Trail Creek has an average slope of approximately 6 percent. Riffles and wetlands are the predominant in-stream habitat types in this reach. There are two low quality pools located in the riffle segment formed by an installed piece of LWD. Fish cover includes small wood and brush, overhanging vegetation, undercut banks, filamentous algae, macrophytes, LWD, and boulders. The canopy of this section of Trail Creek comprises small and large coniferous and deciduous trees. Vegetation on the stream bank is relatively limited due to the installed riprap along the entire reach. The streambed substrate is mainly fine and course gravels (WSDOT 2005e).

Unnamed Stream in I-405 Median

The habitat characteristics of Median Stream vary greatly. Distinct differences in habitat exist within each of the two forks

What are riffles?

Riffles are shallow areas of a stream or river in which water flows rapidly over a rocky or gravelly streambed.

What are macrophytes?

These are large rooted or floating aquatic plants easily visible without a microscope.

What is large woody debris (LWD)?

LWD is an important component of aquatic ecosystems and provides physical structure that aquatic organisms use as habitat. LWD also alters water movements and hydrological processes.

LWD is defined as a log having a diameter of at least 10 centimeters, a length of 2 meters, and protruding into or bridged over the bankfull stream channel.

What is pool quality?

Pool quality designations (high, medium, and low) are based on measurements of depth, substrate, and overhead, submerged, and bank cover. The sum of the weights given to each category determines the quality of the pool.

Looking Upstream at Installed LWD on Trail Creek

and the main channel. Slopes vary from 1 percent to 8 percent. In-stream habitat includes various combinations of riffles, glides, wetlands, and cascades. Portions of the channels are riprapped. Available fish cover includes a mix of LWD, small wood and brush, boulders, and overhanging vegetation. Pools are limited and low in quality. The streambed substrate comprises combinations of silt, fine sediments, sand, fine gravels, and cobbles.

Kelsey Creek

Downstream end of culvert connecting Kelsey Creek with Mercer Slough via a fish ladder

Kelsey Creek, from the culvert at the I-405 southbound off-ramp to SE 8th Street upstream to the BNSF trestle, is approximately 300 feet long and has a slope of roughly 1 percent. The creek has been channelized to accommodate roadway and railroad infrastructure and most of the stream banks are armored with riprap. In-stream habitat types in this reach are a mix of riffle and pools. Fish cover consists of overhanging vegetation, brush and small woody debris, boulders, and filamentous algae. The streambed substrate is predominantly cobble-sized material (WSDOT 2005e).

Sturtevant Creek

Sturtevant Creek upstream of I-405 is in a culvert for more than 300 feet from the edge of the project footprint. The I-405 cross-culvert completely blocks fish passage to both up- and downstream migration.

Sturtevant Creek, from where it daylights immediately downstream of I-405 to where it crosses under SE 6th Street into the wetland complex, is approximately 1,400 feet long with an average slope of roughly 1-2 percent. The creek has been channelized throughout this entire length to accommodate commercial development. Most of the stream banks are armored with riprap. Riffles and glides are the predominant in-stream habitat types in the creek. We identified eight pools. Fish cover includes overhanging vegetation, filamentous algae, macrophytes, brush and small woody debris, undercut banks, boulders, and culverts. The streambed substrate mainly comprises fine- and course-sized gravels (WSDOT 2005e).

Mercer Slough

WSDOT did not survey Mercer Slough for stream characteristics since it is a wetland complex. We described this system previously in the Wetlands section of this report.

Which fish and aquatic species occur in the study area?

Many fish and other aquatic species inhabit the waterbodies in the study area. Fish species found in the area include both anadromous and resident salmonids and a variety of other resident fish. We found other aquatic species in the area including macroinvertebrates, lampreys, crayfish, amphibians, and freshwater mussels and clams.

Native species of salmonids include Chinook (*Oncorhynchus tshawytscha*), coho (*O. kisutch*), sockeye salmon (*O. nerka*), steelhead trout (*O. mykiss*) and searun cutthroat (*O. clarki clarki*). Records are incomplete as to whether pink (*O. gorbuscha*) and chum salmon (*O. keta*) reproduce in the Kelsey Creek sub-basin (Kerwin 2001). Resident rainbow and resident cutthroat trout (*O. clarki*) are known to use the waterbodies in the study area. Bull trout (*Salvelinus confluentus*) and Dolly Varden (*Salvelinus malma*) have not been found in the area; however, the U.S. Fish and Wildlife Service (USFWS) has designated Lake Washington and all of its accessible tributaries and lakes as foraging, migration, and overwintering habitat for bull trout.

Anadromous salmonid species use the streams, wetlands, and sloughs in the study area primarily for upstream and downstream migration and rearing. The study area contains limited spawning habitat for Chinook, coho, and steelhead. Resident cutthroat trout 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 *(Rhinichthys osculus)*, longfin smelt *(Spirinchus thaleichthys)*, prickly sculpin (*Cottus asper)*, riffle sculpin *(Cottus gulosus)*, reticulate sculpin *(Cottus perplexus*), shorthead sculpin *(Cottus confuses*), torrent sculpin *(Cottus rhotheus*), largescale sucker (*Catostomus macrocheilus*), peamouth chub (*Mylocheilus caurinus)*, bluegill (*Lepomis macrochirus)*, and redside shiner *(Richardsonius balteatus*).

Other native species found in the study area include Pacific lamprey *(Lampetra tridentate)*; river lamprey *(Lampetra ayresi)*; western brook lamprey *(Lampetra richardsoni)*; several species of crayfish, frogs, and salamanders; and freshwater clams and mussels (WSDOT 2005e).

What are anadromous and resident fish?

Anadromous fish are born in freshwater streams, rivers or lakes, spend their adult phase in the ocean, and return to their natal waters to spawn.

Resident fish spend their entire lives in freshwater systems and do not migrate into saltwater environments.

What are macroinvertebrates?

Macroinvertebrates are small animals without backbones, which are visible with the naked eye (insects, worms, larvae, etc.). Waterbodies have communities of aquatic macroinvertebrates. The species composition, species diversity, and abundance of the macroinvertebrates in a given waterbody can provide valuable information on the relative health and water quality of a waterway.

What is a salmonid?

This is a fish of the family Salmonidae; for example, salmon, trout, and char.

Unnamed Tributaries to Mercer Slough Wetlands

WSDOT does not expect anadromous fish to use any of the unnamed tributaries to Mercer Slough because none are directly connected to other waterbodies. It is possible that these drainages could be used by resident fish species that are typically more tolerant to water quantity and quality limitations (e.g., sticklebacks); however, due to the disconnected nature of these streams, fish use is unlikely (WSDOT 2005e).

Trail Creek

Biologists do not expect anadromous fish to be present in Trail Creek due to the lack of a defined stream channel downstream of where Trail Creek enters the Mercer Slough wetlands.

Resident fish species that could occur in Trail Creek, based on known distributions, include cutthroat and rainbow trout, sculpins, and longnose and speckled dace (Wydoski and Whitney 1979).

Unnamed Stream in I-405 Median

Anadromous fish are not likely to be present in Median Stream because the culvert under I-405 acts as a barrier to upstream fish passage.

Resident fish species could be present in the portion of Median Stream within the I-405 median; however, resident fish species are more likely to use the downstream reach of the creek due to its connection with Mercer Slough. Resident fish species likely to use Median Stream include cutthroat and rainbow trout, sculpins, western brook and Pacific lamprey, longnose dace, and speckled dace (Wydoski and Whitney 1979).

Kelsey Creek

Anadromous fish species known to occur in Kelsey Creek include Chinook, coho, and sockeye salmon, and steelhead (KCDNR 2001).

Resident fish species known to occur in Kelsey Creek include cutthroat and rainbow trout, sculpins, western brook and Pacific lamprey, longnose dace, speckled dace, largescale sucker, and bluegill (Kerwin 2001).

Sturtevant Creek

The only anadromous fish species known to occur in Sturtevant Creek are coho salmon (City of Bellevue 2002). Due to

Sturtevant Creek's connection with Mercer Slough, other salmonid species that may occur in Sturtevant Creek include steelhead and Chinook salmon.

Resident fish species expected to occur in Sturtevant Creek include cutthroat trout, lamprey, and sculpin. Resident fish species that may occur in Sturtevant Creek, based on their geographic distribution and habitat requirements, include longnose dace, speckled dace, largescale sucker, and three-spine stickleback (Wydoski and Whitney 1979).

Mercer Slough

Due to its connection with Lake Washington and the tributaries mentioned above, Mercer Slough provides habitat for a variety of fish and aquatic species. All fish species known to use Lake Washington are presumed to be present in Mercer Slough.

Documented anadromous fish species known to occur in Lake Washington include Chinook, coho, sockeye salmon, and steelhead (Kerwin 2001).

Resident fish species known to occur in Lake Washington include kokanee, cutthroat and rainbow trout, sculpins, western brook and Pacific lamprey, longnose dace, speckled dace, largescale sucker, and bluegill (Wydoski and Whitney 1979).

Scientists have identified twenty-four non-native fish species in Lake Washington. Some of these species are known to prey on juvenile salmon (e.g., smallmouth bass) while others are potential competitors with juvenile salmonids for food (Kerwin 2001).

Do any federally listed aquatic species or federal aquatic species of concern occur in the study area?

Several of the rivers, streams, and sloughs in the study area contain various life stages of Chinook salmon and bull trout, which are currently listed as threatened under the Endangered Species Act (ESA).

Scientists know that Chinook salmon use Kelsey Creek and Mercer Slough. Chinook use the study area primarily for upstream and downstream migration and rearing; however, there is also some limited spawning habitat in Kelsey Creek. The Chinook salmon found in these waterbodies are a part of the Puget Sound evolutionarily significant unit (ESU) of Chinook salmon, listed as threatened under the ESA (NMFS 1998, 1999).

What is the Endangered Species Act?

Congress passed the ESA in 1973, which governs how animal and plant species whose populations are dangerously in decline or close to extinction will be protected and recovered.

What is an evolutionarily significant unit?

An ESU or evolutionarily significant unit of a fish species is the term used by NMFS for the population protected by a listing under the ESA.

On December 14, 2004, the National Marine Fisheries Service (NMFS) published proposed rules for designating critical habitat for 13 ESUs of Pacific salmon and steelhead in Washington, Oregon, and Idaho. This designation includes the Puget Sound ESU of Chinook salmon. Critical habitat is designated for areas containing the physical and biological habitat features, or primary constituent elements (PCEs), essential for the conservation of the species or which require special management considerations. PCEs include sites that are essential to supporting one or more life stages of the ESU and which contain physical or biological features essential to the conservation of the ESU. Kelsey Creek and Mercer Slough are critical habitat for Chinook salmon.

The Lake Washington system contains important foraging, migration, and overwintering habitat for bull trout recovery (USFWS 2004). Mercer Slough is directly connected to Lake Washington and also provides foraging, migration, and overwintering habitat for bull trout.

On June 25, 2004, the USFWS published proposed rules for designating critical habitat for the Coastal-Puget Sound population of bull trout, which was listed as a threatened species in 1999 under the ESA. 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 re-establish to achieve recovery.

Coho salmon and Pacific and river lamprey, all federal species of concern under the ESA, can be found in the waterbodies in the vicinity of the study area (WSDOT 2005e).

Do any state-listed or other state priority aquatic species occur in or around the study area?

Priority fish 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 were addressed earlier in this report. No other state sensitive, threatened, or endangered fish species occur within the study area. Other fish species designated as Priority Species that may

occur within the study area include coho, chum, and sockeye salmon; steelhead trout; and coastal cutthroat trout (WDFW 2004).

How will the Build Alternative affect fish and aquatic habitat?

Construction

Direct Effects

Some aquatic habitats will experience temporary direct effects and others permanent direct effects as a result of the construction of the Bellevue Nickel Improvement Project. There will be loss of existing stream habitat in Median Stream. Some streams may also experience minor temporary flow changes. Because most of the existing streamside vegetation in the study area is moderately to severely degraded, we expect effects on vegetation to be minor.

Specific project elements that will affect fish and aquatic habitat include:

- Removing 500 linear feet of Median Stream (only resident fish may be affected; anadromous fish are not likely to be present) from its present location and creating 500 linear feet of new stream channel in the area west of the SB lanes of I-405; and
- Removing 43,500 square feet of Median Stream's existing steamside buffer.

Indirect Effects

WSDOT does not anticipate any detectable indirect effects resulting from direct effects on fish and aquatic habitat noted above because of the relatively poor quality of the habitat and the limited use, if any, of the stream by resident fish.

Cumulative Effects

Some losses/degradation of aquatic habitat and temporary short-term decreases in water quality will occur due to the construction of the Bellevue Nickel Improvement Project. The Renton to Bellevue Project will similarly directly affect fish and aquatic habitat and may also involve in-water work for bridging across May Creek and Coal Creek. These construction effects (e.g., loss of streamside vegetation, increased sedimentation, changes in stream flows, and stream course modifications) will be

minimized through the use of BMPs, compliance with permit conditions, including in-water work windows set by the fish and wildlife agencies, and by including avoidance measures in the project design itself.

The Kelsey Creek Park Stream Restoration Project will improve Kelsey Creek and possibly its west tributary. Improvements will include installing spawning beds, creating riffle/pool complexes, and planting trees, thereby providing rearing habitat and habitat for returning adults. Additionally, creating wetlands within the streamside zone may increase habitat, reduce turbidity, and cool water temperatures by shading.

The Kamber Road Project will beneficially affect fish habitat as well. The City of Bellevue replaced three small piped culverts with a much larger box culvert that improves fish passage under Kamber Road. The culvert has a natural creek bottom and allows for fish passage during both high and low flows. The project also included instream habitat improvements immediately up- and downstream of the crossing.

The I-90 Two Way Transit and HOV Operations Project, however, may involve in-water work in the Mercer Slough area, which could temporarily adversely affect nearshore habitats.

Operation

Direct Effects

Through maintenance and operation of the project's water treatment facilities, we will prevent any decline in water quality and, therefore, any negative effects to fish and aquatic habitat.

Indirect Effects

Improved general ecosystem health may be a potential, although possibly not measurable, indirect effect associated with the direct effects on fish and aquatic habitat due to the operation of the Bellevue Nickel Improvement Project.

Cumulative Effects

WSDOT's maintenance and continued operation of the Bellevue Nickel Improvement Project's water treatment facilities, combined with those associated with the Renton to Bellevue Project and the I-90 Two Way Transit and HOV Operations Project, should result in a positive cumulative effect on fish and aquatic habitat. Furthermore, proper maintenance of the improvements provided by the Kelsey Creek Park Stream Restoration and Kamber Road projects previously mentioned

will maintain their positive cumulative effects on fish and aquatic habitat as well.

How would the No Build Alternative affect fish and aquatic habitat?

Because no construction would occur for the No Build Alternative, no fish or aquatic habitat would be affected. At present, some surface waters in the study area receive untreated runoff from stormwater facilities that do not meet current treatment levels. To the degree that those surface waters are adversely affected by the existing water quality, those effects would likely continue and could translate into negative effects on fish and aquatic habitat.

Improvements and enhancements associated with the Bellevue Nickel Improvement Project would not occur.

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

Measures to Avoid or Minimize Project Effects

What measures will be required to avoid or minimize adverse cumulative effects due to the Bellevue Nickel Improvement Project?

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

Additional travel lanes will immediately benefit local residents, commuters, transit riders, and freight haulers.

Unavoidable Adverse Effects

Will there be unavoidable adverse cumulative effects due to the Bellevue Nickel Improvement Project?

WSDOT does not anticipate any unavoidable adverse cumulative effects due to the Bellevue Nickel Improvement Project.

Some streams in the study area have been altered to accommodate residential land use.

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Appendix A

Avoidance and Minimization Measures

Avoidance and Minimization Measures

The following sections describe the established design and construction practices that WSDOT will include to avoid or minimize effects to the various environmental resources during both the construction and operation phases of the project.

Project Measures to Avoid or Minimize Effects During Construction

Design elements, such as modifications to boundaries of areas that can be affected, have been incorporated into the project specifications, construction plans, and procedures, to help avoid or minimize most potential construction impacts. When appropriate, monitoring will be conducted to ensure that these design and construction measures are effective.

Measures for Geology, Soils, and Groundwater

- WSDOT will prepare and implement a Temporary Erosion and Sedimentation Control (TESC) plan consisting of operational and structural measures to control the transport of sediment. Operational measures include removing mud and dirt from trucks before they leave the site, covering fill stockpiles or disturbed areas, and avoiding unnecessary vegetation clearing. Structural measures are temporary features used to reduce the transport of sediment, such as silt fences and sediment traps.
- WSDOT will reduce degradation of moisture-sensitive soils by limiting major earthwork to the drier, late spring through early fall construction season; by maintaining proper surface drainage to avoid ponding of surface water or groundwater; by minimizing ground disturbance through limiting the use of heavy equipment, limiting turns, and/or not tracking directly on the subgrade; and by covering the final subgrade elevation with a working mat of crushed rock and/or geotextile for protection. Mixing a soil admix such as cement into the subgrade may also add strength and stabilize the ground.
- WSDOT will determine acceptable limits for off-site construction-related ground vibration before construction begins and demonstrate that off-site ground vibrations are within the limits set for the project through the use of vibration-monitoring equipment.
- WSDOT will identify areas subject to shaking from a large earthquake and will mitigate risks using ground modifications or other procedures identified in the WSDOT Geotechnical Design Manual.
- WSDOT will implement construction procedures identified in the geotechnical investigation to maintain or enhance slope stability in areas potentially underlain by landslide-prone soils.
- WSDOT will protect the Kelsey Creek aquifer from contamination by construction-related spills by development and implementation of BMPs and a Spill Prevention Control and

Countermeasures plan (SPCCP). The SPCC will specifically address fuel spills from vehicles and from spills of other chemicals commonly transported over I-405. Spill response equipment will be located at regular and specified intervals within the project area for minimizing countermeasure response times.

- WSDOT will ensure only clean fill is imported and placed for the project and will require documentation for fill brought onto the site from the supplier certifying that the fill does not exceed Washington State soil cleanup standards. If documentation is not available, testing of imported fill soils will be required prior to placement. Suspect soils encountered during project construction will be tested and, where necessary, removed from the site and disposed of in accordance with Washington State regulations.
- WSDOT will identify and develop staging areas for equipment repair and maintenance away from all drainage courses. Washout from concrete trucks will not be dumped into storm drains or onto soil or pavement that carries stormwater runoff. A wash down area for equipment and concrete trucks will be designated and the use of thinners and solvents to wash oil, grease, or similar substances from heavy machinery or machine parts will be prohibited.
- WSDOT will obtain a NPDES (National Pollutant Discharge Elimination System) permit and will conduct a regular program of testing and lab work to ensure that water encountered during construction meets the water quality standards specified in the NPDES permit.
- WSDOT will to meet the NPDES water quality standards prior to the discharge of the encountered water to a surface water body, such as Kelsey Creek. If necessary, water quality will be improved, such as by using sediment ponds to allow sediment to settle out prior to discharge.
- If it is necessary to install seepage drains to control seepage for retaining walls and fill embankments, WSDOT will include special provisions in the design to discharge drain flow back into affected areas, including wetlands.

Measures for Water Quality

In addition to measures for geology, soils, groundwater, and for hazardous materials that are protective of water quality, the following measures would be implemented for water quality.

- WSDOT will identify and develop staging areas for equipment repair and maintenance away from all drainage courses.
- Washout from concrete trucks will not be dumped into storm drains or onto soil or pavement that carries stormwater runoff.
- Thinners and solvents will not be used to wash oil, grease, or similar substances from heavy machinery or machine parts.
- WSDOT will designate a wash down area for equipment and concrete trucks.

Measures for Wetlands

- WSDOT will protect, preserve, and enhance wetlands in the project area during the planning, construction, and operation of transportation facilities and projects consistent with USDOT Order 5660.1A, Executive Order 11990, and Governor's Executive Orders EO 89-10 and EO 90-04.
- WSDOT's project-level design and environmental review has included avoidance, minimization, restoration, and compensation of wetlands. WSDOT will implement these measures prior to or concurrent with adverse effects on wetlands, to reduce temporal losses of wetland functions.
- WSDOT will follow guidance contained in the wetlands section of the WSDOT Environmental Procedures Manual (WSDOT 2004a), which outlines the issues and actions to be addressed prior to authorizing work that could affect wetlands.
- WSDOT will use high-visibility fencing to clearly mark wetlands to be avoided in the construction area.

Measures for Upland Vegetation and Wildlife

- WSDOT will ensure mitigation measures established in the I-405 Corridor EIS will be implemented on the Bellevue Nickel Improvement Project.
- WSDOT will prepare and implement a revegetation plan. In addition, areas with mixed forest will not be removed for temporary use (i.e., construction staging). If an area of mixed forest must be removed for roadway construction, it will be replaced with plantings of native tree and shrub species within the affected area.
- WSDOT will adhere to project conditions identified in the Biological Assessment and agency concurrence letters.
- WSDOT will limit construction activity to a relatively small area immediately adjacent to the existing roadway to minimize vegetation clearing and leave as many trees as possible.

Measures for Fisheries and Aquatic Resources

- WSDOT will implement construction BMPs (such as silt fencing or sedimentation ponds) to avoid disturbing sensitive areas during the development and use of any staging areas, access roads, and turnouts associated with resurfacing activities.
- WSDOT will not allow in-water work to occur except during seasonal work windows established to protect fish.
- WSDOT will require that all stormwater treatment wetland/detention facilities are sited and constructed at a sufficient distance from named and unnamed streams so no grading or filling in the streams or the streamside zones will be required.

Measures for Air Quality

- WSDOT will require preparation and implementation of a Fugitive Dust Control Plan in accordance with the Memorandum of Agreement between WSDOT and PSCAA Regarding Control of Fugitive Dust from Construction Projects (October 1999).
- During dry weather, exposed soil will be sprayed with water to reduce emissions of and deposition of particulate matter (PM_{10}).
- WSDOT will provide aequate freeboard (space from the top of the material to the top of the truck), cover truckloads, and, in dry weather, wet materials in trucks to reduce emission of and deposition of particulate matter during transport.
- WSDOT use wheel washers to remove particulate matter that would otherwise be carried offsite by vehicles to decrease deposition of particulate matter on area roadways.
- WSDOT will remove particulate matter deposited on public roads to reduce mud on area roadways.
- WSDOT will cover or spray with water any dirt, gravel, and debris piles during periods of high wind when the stockpiles are not in use to control dust and transmissions of particulate matter.
- WSDOT will route and schedule construction trucks to reduce travel delays and unnecessary fuel consumption during peak travel times, and therefore reduce secondary air quality impacts (i.e. emissions of carbon monoxide and nitrogen oxides) that result when vehicles slow down to wait for construction trucks.

Measures for Noise

- Noise berms and barriers will be erected prior to other construction activities to provide noise shielding.
- The noisiest construction activities, such as pile driving, will be limited to between 7 AM and 10 PM to reduce construction noise levels during sensitive nighttime hours.
- Construction equipment engines will be equipped with adequate mufflers, intake silencers, and engine enclosures.
- Construction equipment will be turned off during prolonged periods of nonuse to eliminate noise.
- All equipment will be maintained appropriately and equipment operators will be trained in good practices to reduce noise levels.
- Stationary equipment will be stored away from receiving properties to decrease noise.
- Temporary noise barriers or curtains will be constructed around stationary equipment that must be located close to residences.
- Resilient bed liners will be required in dump trucks to be loaded on site during nighttime hours.

- WSDOT use Occupational Safety and Health Administration (OSHA)-approved ambient sound-sensing backup alarms that would reduce disturbances during quieter periods.

Measures for Hazardous Materials

Known or Suspected Contamination within the Build Alternative Right of Way

- WSDOT will prepare an SPCCP that provides specific guidance for managing contaminated media that may be encountered within the right of way (ROW).
- WSDOT may be responsible for remediation and monitoring of any contaminated properties acquired for this project. WSDOT will further evaluate the identified properties before acquisition or construction occurs. Contamination in soils will be evaluated relative to the Model Toxics Control Act (MTCA).
- If WSDOT encounters an underground storage tank (UST) within the ROW, WSDOT will assume cleanup liability for the appropriate decommissioning and removal of USTs. If this occurs, WSDOT will follow all applicable rules and regulations associated with UST removal activities.
- WSDOT will conduct thorough asbestos-containing material/lead paint building surveys by an Asbestos Hazard Emergency Response Act (AHERA)-certified inspector on all property structures acquired or demolished. WSDOT will properly remove and dispose of all asbestos-containing material/lead-based paint in accordance with applicable rules and regulations.
- Construction waste material such as concrete or other harmful materials will be disposed of at approved sites in accordance with Sections 2-01, 2-02, and 2-03 of the WSDOT Standard Specifications.
- WSDOT may acquire the responsibility for cleanup of any soil or groundwater contamination encountered during construction (that must be removed from the project limits) within WSDOT ROW. Contamination will be evaluated relative to Model Toxics Control Act (MTCA) cleanup levels.
- WSDOT will consider entering into pre-purchaser agreements for purpose of indemnifying itself against acquiring the responsibility for any long-term cleanup and monitoring costs.
- All regulatory conditions imposed at contaminated properties (e.g., Consent Decree) associated with construction will be met. These conditions could include ensuring that the surrounding properties and population are not exposed to the contaminants on the site: i.e., WSDOT will ensure that the site is properly contained during construction so that contaminants do not migrate offsite, thereby protecting the health and safety of all on-site personnel during work at the site.

Known or Suspected Contamination Outside of the Right of Way

- Contaminated groundwater originating from properties located up-gradient of the ROW could migrate to the project area. WSDOT generally will not incur liability for groundwater contamination that has migrated into the project footprint as long as the agency does not

acquire the source of the contamination. However, WSDOT will manage the contaminated media in accordance with all applicable rules and regulations.

Unknown Contamination

- If unknown contamination is discovered during construction, WSDOT will follow the SPCCP as well as all appropriate regulations.

Worker and Public Health and Safety and other Regulatory Requirements

The WSDOT will comply with the following regulations and agreements:

- State Dangerous Waste Regulations (Chapter 173-303 WAC);
- Safety Standards for Construction Work (Chapter 296-155 WAC);
- National Emission Standards for Hazardous Air Pollutants (CFR, Title 40, Volume 5, Parts 61 to 71);
- General Occupational Health Standards (Chapter 296-62 WAC); and
- Implementing Agreement between Ecology and WSDOT Concerning Hazardous Waste Management (April 1993).

Hazardous Materials Spills During Construction

- WSDOT will prepare and implement a SPCCP to minimize or avoid effects on human health, soil, surface water and groundwater.

Measures for Traffic and Transportation

- WSDOT will coordinate with local agencies and other projects to prepare and implement a Traffic Management Plan (TMP) prior to making any changes to the traffic flow or lane closures. WSDOT willl inform the public, school districts, emergency service providers, and transit agencies of the changes ahead of time through a public information process. Pedestrian and bicycle circulation will be maintained as much as possible during construction.
- Prior to and during construction, WSDOT will implement strategies to manage the demand on transportation infrastructure. These transportation demand management strategies will form an important part of the construction management program and will be aimed at increasing public awareness and participation in HOV travel. The major focus will be on expanding vanpooling and van-share opportunities. Other elements of the transportation demand management plan may include:
    - increased HOV awareness and public information, and
    - work-based support and incentives.

Measures for Visual Quality

- WSDOT will follow the I-405 Urban Design Criteria. Where the local terrain and placement of light poles allow, the WSDOT will reduce light and glare effects by shielding roadway lighting and using downcast lighting so light sources will not be directly visible from residential areas and local streets.
- WSDOT will restore (revegetate) construction areas in phases rather than waiting for the entire project to be completed.

Measures for Neighborhoods, Businesses, Public Services and Utilities

- WSDOT will prepare and implement a transportation management plan (TMP). If local streets must be temporarily closed during construction, WSDOT will provide detour routes clearly marked with signs.
- WSDOT will coordinate with school districts before construction.
- WSDOT will implement and coordinate the TMP with all emergency services prior to any construction activity.
- WSDOT will coordinate with utility providers prior to construction to identify conflicts and resolve the conflicts prior to or during construction. Potential utility conflicts within WSDOT ROW will be relocated at the utility's expense prior to contract award.
- WSDOT will prepare a consolidated utility plan consisting of key elements such as existing locations, potential temporary locations and potential new locations for utilities; sequence and coordinated schedules for utility work; and detailed descriptions of any service disruptions. This plan will be reviewed by and discussed with affected utility providers prior to the start of construction.
- WSDOT will field verify the exact locations and depths of underground utilities prior to construction.
- WSDOT will notify neighborhoods of utility interruptions by providing a scheduled of construction activities in those areas.
- WSDOT will coordinate with utility franchise holders and provide them with project schedules to minimize the effects of utility relocations (for example, equipment procurement times, relocation ahead of construction, etc.)
- WSDOT will notify and coordinate with fire departments for water line relocations that may affect water supply for fire suppression, and establish alternative supply lines prior to any breaks in service; and to ensure that fire departments can handle all calls during construction periods and to alleviate the potential for increased response times.
- WSDOT will notify and coordinate with police departments to implement crime prevention principles and to ensure that they have adequate staffing to provide traffic and pedestrian control.

- WSDOT will maintain access to businesses throughout the construction period through careful planning of construction activities and an awareness of the needs to provide adjacent properties with reasonable access during business hours. As part of construction management, WSDOT will prepare access measures. WSDOTT will make provisions for posting appropriate signs to communicate the necessary information to potential customers.
- WSDOT will keep daytime street closures to a minimum to provide access for businesses during regular business hours.

Measures for Cultural Resources

- WSDOT will prepare an Unanticipated Discovery Plan for the project that WSDOT will follow. This will avoid or minimize unanticipated effects to historic, cultural, and archaeological resources.

Project Measures to Avoid or Minimize Effects During Project Operation

The following sections describe the measures that WSDOT will implement during project operation.

Measures for Surface Waters and Water Quality

- WSDOT will follow the Highway Runoff Manual for both the design and implementation of stormwater facilities. WSDOT is not required to manage flow where drainage is directly to Mercer Slough. Where drainage is to a tributary to Mercer Slough, WSDOT will construct a stormwater management system that does provide flow control.

Measures for Fisheries and Aquatic Resources

- WSDOT will compensate for adverse effects to fish habitat and aquatic resources by providing in-kind mitigation. This in-kind mitigation will take the form of on-site, off-site, or a combination of on- and off-site mitigation.
- Off-site mitigation could include planting native riparian vegetation outside of the study area in areas where restoring native riparian buffers may have a greater benefit to fish and aquatic species. Mitigation could be concentrated along streams with high fish use where important stream processes and functions related to riparian buffers (for example, large woody debris [LWD] recruitment levels, litter fall, and bank stabilization) are impaired.
- On-site/off-site mitigation could include installing in-stream habitat features (for example, boulders or LWD) in the streambed downstream of the project footprint to increase the habitat complexity of the affected waterbody.

- Ongoing maintenance (during and post-construction) of stormwater treatment and detention facilities by WSDOT will not include the application of any chemical weed control agents (e.g., herbicides).

Measures for Upland Vegetation and Wildlife

- WSDOT will replace areas of mixed forest that will be permanently removed for roadway construction with plantings of native tree and shrub species within the affected area.