CHAPTER 6

Cumulative Effects Analysis

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

The Renton to Bellevue Project will benefit water quality

What are cumulative effects and why do we study them?

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

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

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

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

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

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

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

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

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

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

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

What are the time and geographic boundaries for this analysis?

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

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

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

Geographic Boundaries

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

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

Time Period Boundaries

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

Exhibit 6-1: Expanded cumulative effects study area

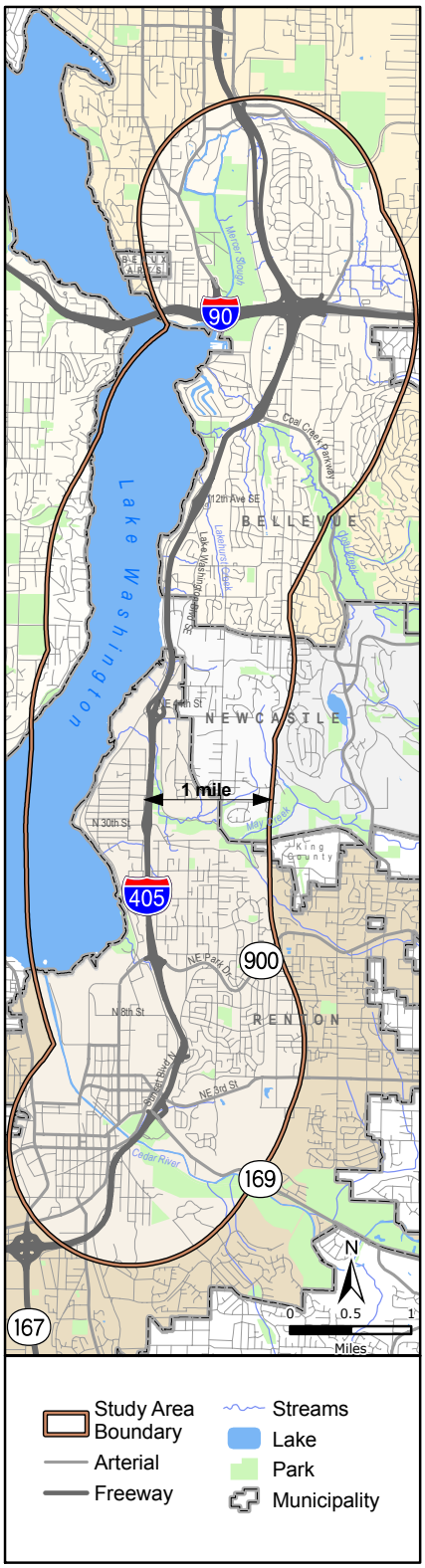
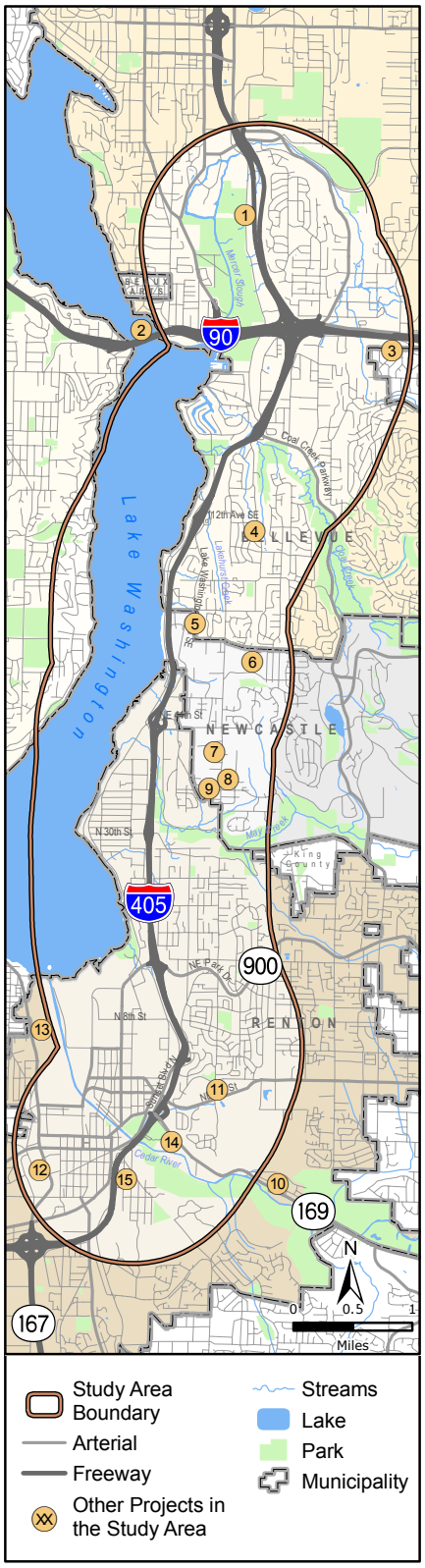


Exhibit 6-2: Projects considered in cumulative effects analysis



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

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

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

What has been the history of the environmental resources analyzed?

Air Quality

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

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

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

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

Surface Water

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

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

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

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

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

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

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

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

Wetlands

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

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

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

Fish and Aquatic Habitat

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

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

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

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

Air Quality

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

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

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

Surface Water

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

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

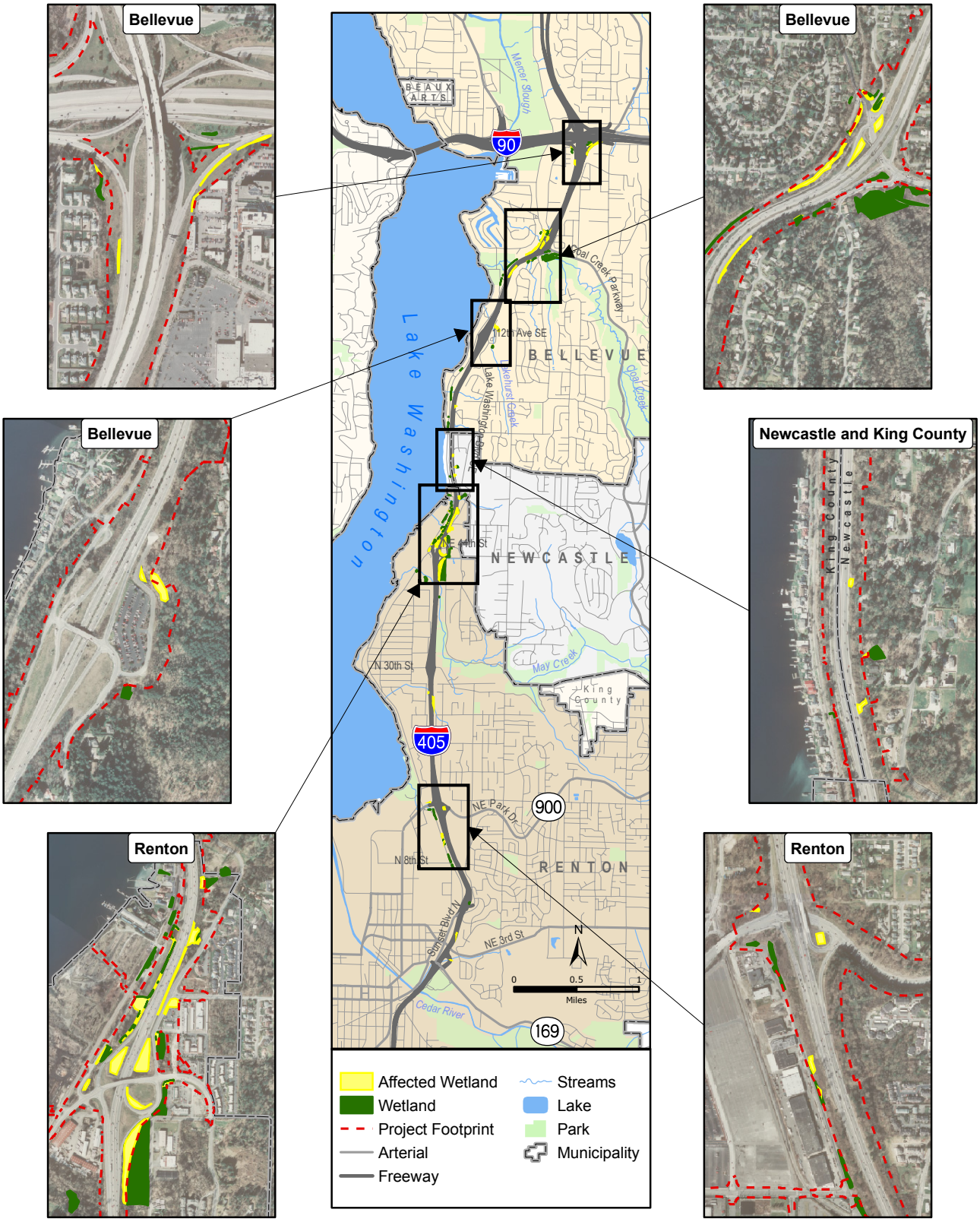
result, construction-related cumulative effects on surface waters attributable to the Renton to Bellevue Project and the other projects should be temporary and of low magnitude.

Wetlands

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

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

Exhibit 6-3: Wetlands in the project area



Fish and Aquatic Habitat

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

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

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

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

Air Quality

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

Surface Water

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

Wetlands

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

Fish and Aquatic Habitat

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

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

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

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

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

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

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

What measures are proposed to minimize cumulative effects?

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