

## CHAPTER 5.9 Cumulative Effects

*The Tukwila to Renton Project will not have adverse effects in conjunction with other nearby projects. Design requirements and standard construction practices keep project effects to a minimum. Cumulatively in the region, new construction projects can be beneficial because they often retrofit older development thereby improving environmental conditions in urban areas.*

Cumulative effects are important to consider during the construction and operation of a project. While project effects may be minor when viewed in the individual context, they can add to the effects of other actions and eventually lead to a measurable environmental change.

### ***What are cumulative effects and why do we study them?***

In the regulations that implement the procedural provisions of the National Environmental Policy Act, the Council on Environmental Quality<sup>13</sup> defines cumulative effects as:

*“The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions.”<sup>14</sup>*

The Council on Environmental Quality recommends that an agency’s analysis accomplish all of 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.



*All activities within watersheds contribute to cumulative effects*

Please refer to the Tukwila to Renton Project Cumulative Effects Analysis Technical Memorandum in Appendix G for a complete discussion of the cumulative effects analysis.

<sup>13</sup> The federal agency charged with implementing the National Environmental Policy Act

<sup>14</sup> 40 CFR 1508.7 Protection of Environment, Council on Environmental Quality, Cumulative Impact

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

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

### ***How does this cumulative effects analysis relate to the analysis in the I-405 Corridor Program Final EIS?***

The cumulative effects analysis for the Tukwila to Renton 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, aquatic resources, surface water, and wetlands. However, for the Tukwila to Renton Project, neither energy nor farmlands were included in the cumulative 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 aquatic resources due to the Tukwila to Renton Project.

### ***What time and geographic boundaries did WSDOT use for this analysis?***

When evaluating cumulative effects, the analyst must consider other projects in the vicinity of the proposed project, as well as past, present, and future actions that may affect the environmental resources of concern.

The geographic scope of analysis is defined in two steps. First, the physical limits or boundaries of the Tukwila to Renton Project's effect on an environmental resource are defined. Second, the boundaries of other activities that also may contribute to the effects on that environmental resource are

defined. These two actions define the geographic scope. 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.

### **Geographic Boundaries**

The geographic boundary for the project-level air quality analysis was set at 0.5 mile from the centerline of the project right-of-way. This boundary allowed the effects on air quality of other nearby projects to be considered.

The geographic boundaries for the wetlands, surface water, and aquatic resources analyses were set at one mile from the centerline of the project right-of-way. Expanding the geographic area beyond that of the direct effect area of the Tukwila to Renton Project allowed a more comprehensive analysis of the cumulative effects on these resources.

### **Time Period Boundaries**

The time period from 1960 through 2030 was set for the four environmental resources that were analyzed. Using 1960 as the starting point for the analyses allowed an assessment of the changes that have occurred since the original construction of I-405. The year 2030 is the future year used in regional transportation planning documents.

### ***How did WSDOT identify other projects to include in this analysis?***

For the effects of other major projects to be considered, the projects must be located within or near the geographic boundaries used for this analysis. The projects must also be reasonably foreseeable, which typically means they are planned, approved, and funded. Specific projects considered in this analysis are:

- Link Light Rail Phase 1 – S 154th Street to Seattle-Tacoma International Boulevard (Sound Transit)
- Link Light Rail Station – Tukwila International Boulevard/Southcenter Boulevard (Sound Transit)
- SR 518 Corridor Improvements (WSDOT)
- Westfield Shoppingtown Mall Access Improvement: Klickitat Drive/Southcenter Parkway (City of Tukwila)

- I-5 Pavement Replacement (WSDOT)
- Strander Boulevard/SW 27th Street (City of Tukwila)
- I-405, Renton Nickel Improvement Project (WSDOT)
- Black River Pump Station Improvements (King County)
- Springbrook Creek Wetland and Habitat Mitigation Bank (WSDOT/City of Renton)
- SR 167 HOT Lanes Pilot Project (WSDOT)
- SR 515 Corridor Improvements (WSDOT)
- Benson Road Sidewalk Improvements (City of Renton)
- South Grady Way Improvements (City of Renton)
- Rainier Avenue Improvement Project (City of Renton)
- Boeing Renton Plant Site Redevelopment (The Boeing Company/City of Renton)
- SR 169 Improvements (City of Renton)
- I-405, SR 169 to I-90, Renton to Bellevue Project (WSDOT)

***What is the history of the environmental resources WSDOT evaluated for this analysis?***

**What is a non-attainment area?**

Non-attainment areas are regions that have not attained compliance with the National Ambient Air Quality Standards.

**What is a maintenance area?**

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

**Air Quality**

***Carbon Monoxide***

Air quality in the central Puget Sound Region has varied since 1960. In 1978, air quality had degraded to the point that the central Puget Sound Region was classified by the EPA as a “non-attainment area” for carbon monoxide (CO) and ozone. The degradation was largely a result of the rise in vehicle travel associated with increasing population and urbanization.

Air quality improved over the next two decades due to technological improvements in emissions control equipment and more stringent regulations. This improvement enabled the EPA to designate the region as a “maintenance area” for CO in 1996.

***Climate Change***

**Greenhouse Gas Emissions**

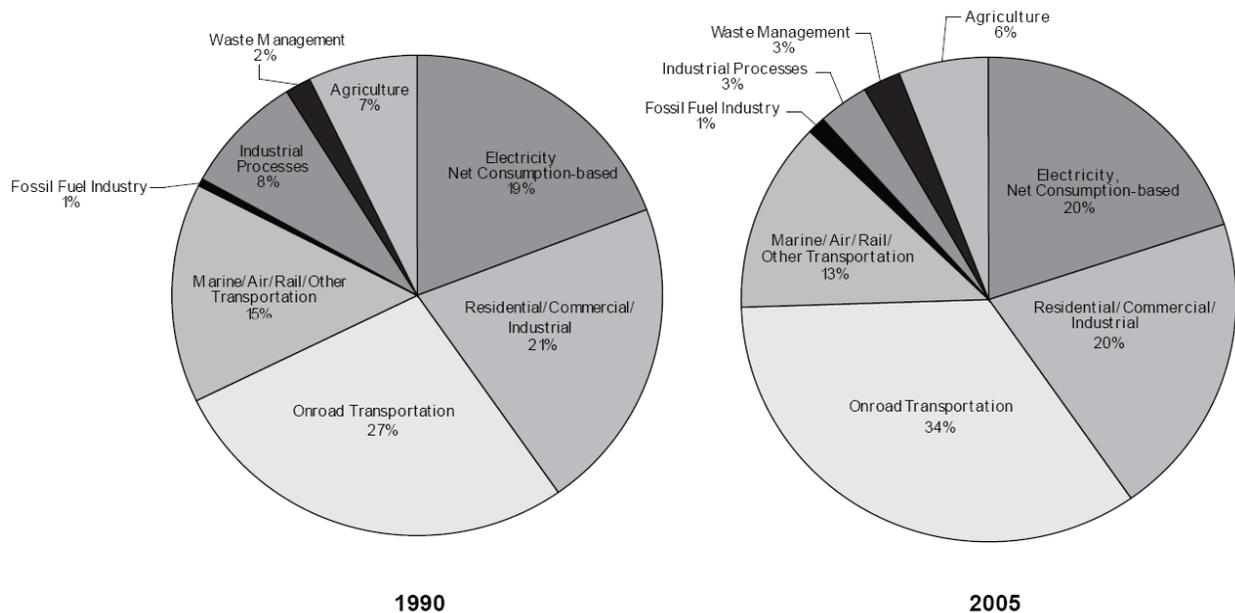
Any process that burns fossil fuel releases carbon dioxide into the air. Carbon dioxide is the primary greenhouse gas emitted

by vehicles. Transportation is a significant source of greenhouse gas emissions, and contributes to global warming through the burning of gasoline and diesel fuel.

National estimates show that the transportation sector (including on-road, airplanes, and boats) accounts for almost 30 percent or more of total domestic CO<sub>2</sub> emissions.<sup>15</sup>

In Washington State, with the state’s reliance on in-state hydropower for electricity generation, the transportation sector accounts for roughly 50 percent of greenhouse gas emissions.

*Exhibit 5-49: Greenhouse Gas Emissions for 1990 and 2005*



Source -- Carbon Dioxide (CO<sub>2</sub>) Emissions in Washington State by Source. Washington State University Energy Program

**Efforts to reduce greenhouse gas emissions**

In February 2007, the Governor issued Executive Order 07-02 requiring state agencies to find ways to reduce greenhouse gas emissions and adapt to the future that climate change may create. In April 2007, the U.S. Supreme Court ruled that the EPA has the authority to regulate greenhouse gas emissions for cars and trucks.

<sup>15</sup> This percentage is based on 2004 data from the International Energy Administration and is consistent with 1996 guidelines on greenhouse gas emissions calculations issued by the IPCC (Intergovernmental Panel on Climate Change).

On May 3, 2007, the Washington legislature passed Senate Bill 6001, which among other things, adopted Governor Gregoire's Climate Change goals into state law. The law aims to achieve 1990 greenhouse gas levels by 2020, a 50 percent reduction below 1990 levels by 2030, and more by 2050. Yet, regulations to implement these goals are in development and will not be sufficiently determined before project design and construction permits are obtained.

At this time, the main way to reduce greenhouse gas emissions by transportation is to reduce the amount of fossil fuel consumed by drivers. This can be achieved by three means:

- (1) create more efficient driving conditions,
- (2) reduce the amount of driving, and
- (3) introduce more fuel-efficient vehicles.

Researchers are also working to reduce the carbon content of motor fuel for the future.

WSDOT is working to reduce driving through a variety of regional and statewide efforts such as commute trip reduction and construction of park-and-ride lots. Through House Bill 1397 in 2005 and the 2007 Senate Bill 5109 revision, the state legislature mandated vehicles sold in Washington, starting with 2009 model years, meet updated California emission standards. The new vehicle standards will reduce greenhouse gas emissions, in addition to reducing carbon monoxide and ozone pollution contributors even more.

### **Surface Water**

According to the 303(d) list Ecology published in 2004, three waterbodies in the study area do not meet the state water quality standards: Green River, Springbrook Creek, and Cedar River. In the study area, the Green River is 303(d)-listed for fecal coliform bacteria, dissolved oxygen, and temperature. Springbrook Creek is 303(d)-listed for not complying with standards for dissolved oxygen and fecal coliform bacteria. The Cedar River is 303(d)-listed for fecal coliform bacteria and temperature downstream of the study area.

In 1982, an NPDES permit was issued to move the outfall of the Renton Wastewater Treatment Plant from the Green River to Puget Sound. This project was completed in early 1987. Prior to the project, the treatment plant was a major source of pollution in the Green River, causing increased temperature, low dissolved oxygen, and ammonia toxicity. In 1992, the EPA approved a TMDL issued by Ecology. The Green River TMDL does not allow discharge of ammonia-nitrogen into the river. No other TMDLs have been developed for the waterbodies in the surface water study area.

### **Wetlands**

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

### **Aquatic Resources**

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

The Lower Green River subbasin has dramatically changed over the last 130 years, but still performs a vital role for the

#### **NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT PROGRAM**

The NPDES permit program was established under Section 402 of the CWA, which prohibits the unauthorized discharge of pollutants from a point source (pipe, ditch, well, etc.) to U.S. waters, including municipal, commercial, and industrial wastewater discharges and discharges from large animal feeding operations. Permittees must verify compliance with permit requirements by monitoring their effluent, maintaining records, and filing periodic reports.

salmon in the watershed. The Lower Green River is a vital migration corridor for fish moving between the Middle Green and the Duwamish estuary. It also provides limited rearing habitat for fish produced upstream.<sup>16</sup>

The Renton Reach of the Cedar River is entirely artificial. It is completely constrained between levees and revetments, and was regularly dredged to prevent flooding (from its completion in 1912 until the mid-1970s). Portions of this reach were again dredged in 1999 for the first time since the mid-1970s. This reach is essentially one long riffle with little habitat complexity. It is affected by urban and industrial uses along the river that contribute to local water quality problems and eliminate the potential for connection with a natural floodplain. These uses also prevent riparian corridors from becoming established, which can provide large woody debris in the channel. Much of the river's sediment is deposited in this reach.

### ***How will construction of this project contribute to cumulative effects?***

#### **Air Quality**

The Tukwila to Renton Project is expected to produce temporary effects on air quality that are characteristic of the construction 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 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 traveling through the work areas.
- Odors associated with the use of asphalt.

Construction-related cumulative effects on air quality due to the Tukwila to Renton Project and other projects should be localized, temporary, and of low magnitude with the

---

<sup>16</sup> KCDNR 2004

proposed mitigation measures in place. This is due to the distance between the projects and their respective schedules, duration, characteristics, and size.

### **Surface Water**

The project will be built in accordance with federal and state technical guidance, permit conditions, and WSDOT project specifications that will require the use of BMPs to control the rate of runoff and, where practical, retain runoff on the site. Therefore, any changes to runoff volumes will be localized, temporary, and of low magnitude. Assuming that similar mitigation measures will be followed for the other projects in the vicinity, construction-related cumulative effects on surface water should also be temporary and of low magnitude.

### **Wetlands**

The Tukwila to Renton Project and several other projects in the area will affect wetlands by permanently or temporarily filling part or all of some wetlands. These projects will also create or enhance more acres of wetlands than are filled or permanently affected. They may also utilize mitigation credits associated with the Springbrook Creek Wetland and Habitat Mitigation Bank. In the long-term, the cumulative effect of these projects will be to create more wetlands that are higher in quality than what will be filled by the projects.

### **Aquatic Resources**

Some losses and degradation of aquatic habitat and short-term decreases in water quality could occur due to construction of the Tukwila to Renton Project and the added lanes for the Renton Nickel Improvement Project and SR 167 HOT Lanes Pilot Project. The Renton to Bellevue Project will similarly directly affect aquatic resources and may also involve in-water work for bridging across May Creek and Coal Creek. These construction effects (for example, loss of riparian vegetation, temporary increased sedimentation, changes in the stream flows, and stream course modifications) will be minimized through the use of BMPs, compliance with permit conditions and in-water work windows set by the fish and wildlife agencies, and by avoidance measures included in the project design. Construction of the other projects considered in the cumulative effects analysis is not expected to affect aquatic resources with the exception of the Springbrook Creek

Wetland and Habitat Mitigation Bank, which will result in improved aquatic habitat.

### ***How will the completed project contribute to cumulative effects?***

#### **Air Quality**

##### *National Ambient Air Quality Standards*

The Tukwila to Renton Project and other transportation projects included in the cumulative effects analysis will not cause or contribute to exceedences of the National Ambient Air Quality Standards. This is because these projects will improve the transportation system's efficiency. These benefits should be realized through 2030.<sup>17</sup>

##### *Greenhouse gas emissions*

Accurate quantitative modeling tools to evaluate greenhouse gas emissions at the project level are not available at this time. They are in development with the EPA, FHWA, and others. However, traffic improvements proposed by this project contribute toward reduced greenhouse gas emissions.

With the additional capacity and roadway changes described in the project description, the Tukwila to Renton Project strives to create more efficient driving conditions by minimizing stop and go conditions and promoting more consistent moderate-speed driving. This proposed project will enable travel speeds to increase an average of 20 mph and provide better movement of vehicles in 2014 for the study area intersections and the mainline, thereby reducing traffic congestion and collisions. Decreased vehicle delay with the direct-connector ramps at the I-405/SR 167 interchange will further reduce collisions and promote more efficient driving.

#### **Surface Water**

The Tukwila to Renton Project and the Renton to Bellevue Project on I-405 will improve water quality because both of these projects will retrofit currently untreated pavement. Other projects in the area will, at a minimum, be required to comply with surface water management regulations. To the

---

<sup>17</sup> WSDOT 2007b

extent those projects also provide enhanced and/or retrofitted treatment, water quality in the area should improve.

### **Wetlands**

The Springbrook Creek Wetland and Habitat Mitigation Bank will provide safe, high-quality wildlife habitat away from roadside dangers. Other projects considered in this analysis that mitigate effects appropriately could also positively affect wetlands. Operation of the Tukwila to Renton Project and the Renton to Bellevue Project may result in a positive cumulative effect to wetlands receiving runoff as a result of the projects retrofitting water quality treatment for impervious surface, as well as enhanced treatment of discharges from the new impervious surfaces.

### **Aquatic Resources**

WSDOT will address fish passage at seven culverts in the project area per the Memorandum of Agreement between WSDOT and WDFW. Where possible and practicable, other highway projects will also replace existing fish barriers with fish passable structures. By opening up previously inaccessible habitat, fish will be able to return to spawning, rearing, migrating, and refuge habitat.

### ***What would happen if WSDOT did not build this project?***

If the Tukwila to Renton Project is not built, no construction would occur and, therefore, none of the improvements associated with the project would be realized. Air quality across the region would likely continue to improve due to improvements in automotive technology. Improvements in water quality would be less because surface waters in the area would continue to receive untreated highway runoff. The existing wetlands near the project would remain intact with no new wetland area created. Improvements to fish passage would also not occur. Assuming the other projects considered in the cumulative effects analysis are constructed, the benefits from these projects would still be realized.

This page intentionally blank.