7.0 INDIRECT EFFECTS, CUMULATIVE EFFECTS, AND OTHER CONSIDERATIONS

This chapter presents the potential indirect effects of the project, as well as the project's potential contribution to cumulative effects in combination with other past, present, or reasonably foreseeable actions near the project. This chapter also discusses how the project may affect global climate change.

The latter portion of the chapter discusses the short-term environmental effects of the project, the resulting long-term benefits, and the commitment of natural, physical, human, and fiscal resources.

7.1 Indirect Effects

7.1.1 What are indirect effects?

Federal law defines indirect effects as effects caused by an action, but occur later in time or farther removed in distance (40 CFR 1508.8). They 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.

7.1.2 Would the Salmon Creek Interchange Project result in any indirect effects?

Indirect effects were evaluated for each element discussed in Chapter 6 of this document. Indirect effects of transportation projects can often result from land use development occurring after a project is constructed. Indirect effects are not limited to changes in land use, and can include any effects of the project that occur later in time or at some distance from the project.

Indirect effects of the project on transportation, noise, land use, historical and cultural resources, air quality, geology and soils, social and economic elements, and visual quality are not anticipated. Indirect effects on these resources often include induced growth resulting from the development of project facilities.

The following section describes the anticipated indirect effects of the project on the water resources, wetlands, wildlife, vegetation, and fish and aquatic resources, hazardous materials, and public services and utilities.

Water Resources

Installation of new water quality treatment and flow-control facilities as part of the project would reduce water pollution and moderate flows in receiving waters. These improvements to the stormwater treatment system will benefit downstream water quality and long-term hydrologic conditions.

Wetlands

Loss of wetlands in the project study area may indirectly affect water resources. Wetlands can provide beneficial water storage and water quality functions, and their loss may affect downstream water quality, and peak and base flows. The indirect effects of the project may include the isolation or degradation of existing wetlands. These effects would occur later in time than the completion of the project. Though wetland effects may occur from isolation and fragmentation of larger wetland systems resulting from the project, local and federal regulatory agency guidelines are designed to preserve and protect wetlands and to ensure there is no net loss of wetland acreage or function.

In addition, the project would create new impervious surfaces and would route stormwater runoff to treatment facilities. This would alter the natural hydrologic system and may indirectly affect wetlands near the project study area.

Vegetation, Wildlife, and Fish and Aquatic Resources

Vegetation

Indirect effects on vegetation would result from the loss of wetlands in the study area and the consequential change in species composition due to alteration of ecological conditions. These effects would occur later in time following the completion of the project.

Wildlife

Additional vehicle use on the roadway system in the project study area may lead to an increase in the likelihood of wildlife mortality as a result of increased human contact and collisions with vehicles. Furthermore, project effects on wetlands would alter habitat in the project study area, which may affect wildlife use. However, compensatory wetland mitigation would provide larger habitat areas, which would replace the lost functions resulting from the project effects on wetlands.

Replacing small roadside wetlands with large offsite mitigation areas may provide improved habitat for local wildlife. These effects would occur later in time than the completion of the project.

Fish and Aquatic Resources

The potential indirect effects to fish and aquatic resources would be primarily related to stormwater runoff from increased impervious surface areas. Contaminants likely to be present in stormwater runoff include petroleum products, metals, and automobile engine coolants such as ethylene glycol. New stormwater treatment facilities would be provided by the project, which would reduce the release of these materials to the environment. These effects would occur following the completion of the project and may be evident in areas farther removed.

Hazardous Materials

The project would improve safety and mobility, thus, decreasing the likelihood of vehicle accidents and resulting spills of hazardous materials. If existing contamination is encountered during construction activities, WSDOT would properly manage the hazardous materials or clean up the contamination; this would result in a long-term beneficial effect.

Public Services and Utilities

Indirect effects to public services outside of the project study area would likely be positive, due to the improvements in transportation conditions that would result in improved travel times.

7.2 Cumulative Effects

7.2.1 What are cumulative effects?

Federal law defines cumulative effects as those that occur as a result of incremental effects of the action when added to other past, present, and reasonably foreseeable future actions, regardless of agency or person that undertakes these actions (40 CFR 1508.7). Cumulative effects can result from individually minor but collectively substantial actions taking place over a period of time.

7.2.2 What resources were evaluated for cumulative effects?

All of the resources analyzed in this document were initially considered for the cumulative effects analysis. However, several of these resources were not analyzed further because they have no potential to contribute to cumulative effects due to a lack of direct adverse effects resulting from the project, even with consideration of other actions in the area.

The remaining resources that are included in the cumulative effects analysis include noise, land use, wetlands, and vegetation, wildlife, and fish and aquatic resources.

7.2.3 What are the temporal and geographic boundaries used for the cumulative effects analysis?

Cumulative effects must be evaluated within a broader geographic and temporal study area than direct effects. The geographic boundaries were determined based on the physical limits of environmental effects of the Salmon Creek Interchange Project on a particular resource, as well as the boundaries of other activities that also may contribute to these effects. Actions other than the project that were examined for the cumulative effects analysis occur within the defined temporal and geographic boundaries. The following sections define these boundaries and describe how the boundaries were determined.

Geographic Boundaries

The cumulative effects geographic boundary for noise includes all areas outside the project study area that can influence noise within the limits of project effects. For land use, the cumulative effects geographic boundary is consistent with the indirect effects portion of the action area defined in the Biological Assessment. The geographic boundary for cumulative effects on wetlands, vegetation, wildlife, fish, and aquatic resources include the Salmon Creek and Whipple Creek watersheds. These expanded boundaries allow for a comprehensive analysis of the cumulative effects on these resources.

For some resources, the range of influence may extend outside of these defined boundaries. For example, anadromous fish that may be affected by actions within these boundaries may also experience effects from activities adjacent to the Columbia

What are temporal and geographic boundaries?

These boundaries are defined to determine the limits of potential cumulative effects of a project. Geographic boundaries are determined based on the spatial extent of project effects in combination with other past, present, and reasonably foreseeable projects. Cumulative effects should also be evaluated within a time frame to reflect the resource concerns, geographic resource study areas, the project, and how other important resources fit in. The past time frame should go back far enough to provide a reasonable historical context to tell the story about important trends and the current state of a resource. A future year should also be selected to provide a reasonable context to estimate the future state of the resource.

What is an action area?

An action area is the area that is directly and indirectly affected by a proposed action as defined in a biological assessment. The action area is usually larger than the project area or project vicinity and includes areas that may be affected later in time than the actions of the proposed project.

River following out-migration. Effects occurring outside the above-defined geographic boundaries, combined with the effects within the defined geographic boundaries, may have a substantial effect on the resource.

Temporal Boundaries

The past temporal boundary was determined based on a particular event that markedly changed the setting of the project vicinity. The major disturbances to environmental resources have resulted from growth, much of which occurred after the opening of the I-205 Glenn Jackson Bridge over the Columbia River in late 1982. Although the area had experienced growth in the period preceding its completion, this bridge connected eastern Clark County with Oregon and provided direct highway access to previously remote areas of eastern Clark County, which led to substantial growth in the area. During the 1990s, Vancouver's city limits expanded by more than 18,000 acres, adding approximately 100,000 new residents.

The temporal boundary examined for cumulative effects of the project extends from 1983 (the first full year of operation for the I-205 Glenn Jackson Bridge) to the design horizon year of 2030. This analysis considered known planned or programmed projects, projects funded or unfunded within the geographic boundaries established for the cumulative effects analysis, and ongoing routine maintenance and short-term minor construction necessary for continued operation of existing facilities.

7.2.4 What actions other than the Salmon Creek Interchange Project are included in the cumulative effects analysis?

Twenty two planned or proposed projects in the Salmon Creek vicinity were considered in relation to cumulative effects associated with the project. These projects are identified in this section and their location is shown in Exhibit 7.2-1.

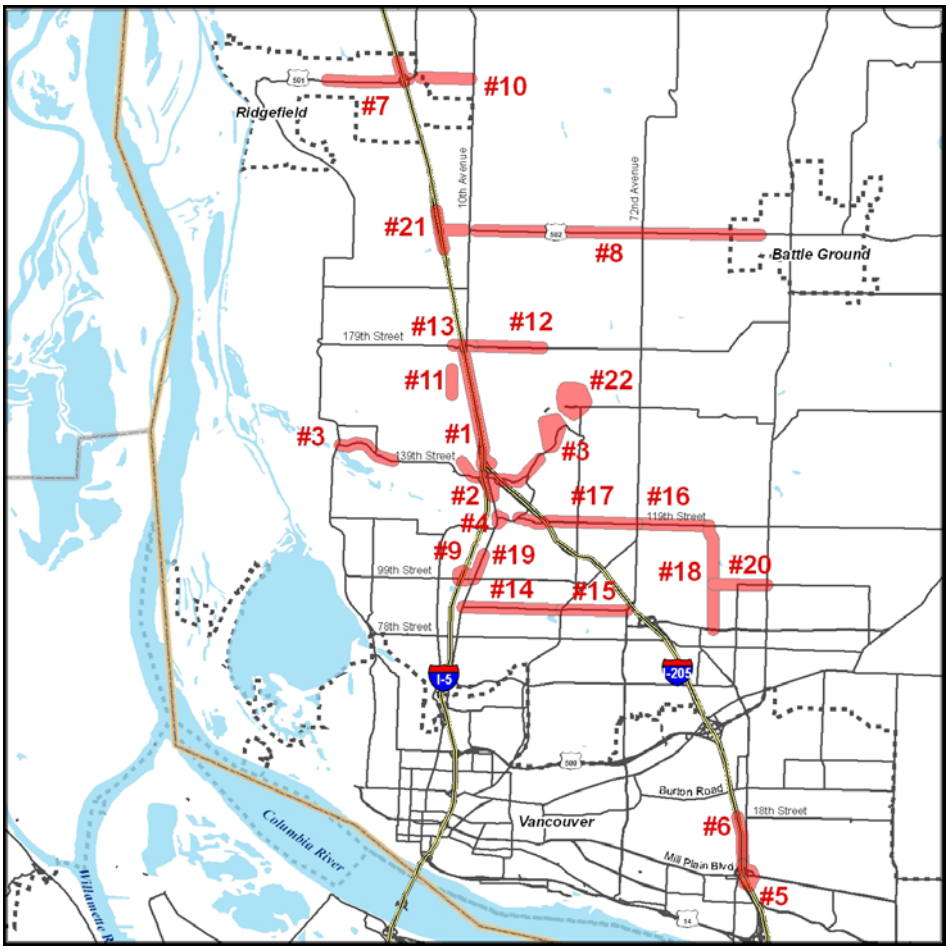

Exhibit 7.2-1. Projects Evaluated for the Cumulative Effects Analysis

1. Future Interchange Improvements: The 2030 traffic analysis indicates that additional improvements to the interchange area and surrounding road system would be needed after completion of Phase 2 improvements and at some point near 2030. These include:

   - Widening of I-5 to three through traffic lanes in each direction from NE 134th Street to the I-205 merge.
   - Auxiliary lanes on I-5 between the I-205 merge and NE 179th Street, and between NE 179th Street and the SR 502/I-5 Interchange.
   - Widening of I-205 to three traffic lanes in each direction south of NE 134th Street.
   - Completing the I-5/NE 139th Street "diamond interchange." This would involve moving the current I-205 southbound off-ramp to NE 134th Street over to I-5, having it intersect NE 139th Street at the same location as the southbound on-ramp to I-5, and realigning the northbound on-ramp to I-5/I-205.

- Widening the Phase 1 proposed northbound off-ramp to NE 139th Street to three lanes: two left-turn lanes, and one right-turn lane.

2. Upgrades to Existing Traffic Signals: Equipment upgrades and/or signal interconnections are planned along NE/NW 139th Street and Skyview High School, NW 2nd Avenue, NE 3rd Avenue, NE 20th Avenue, and NE 23rd Avenue; Tenney Road at NE 136th Street/Fred Meyer and at NE 10th Avenue; NE 134th Street at NE 27th Avenue, NE 29th Avenue, and NE Salmon Creek Avenue; Highway 99/NE 20th Avenue at Safeway; and Highway 99 at NE 129th Street.
3. New Signals: New signals would be installed at the following locations: NW 21st Avenue at NW Bliss Road/Hathaway, NW 139th Street at NW 11th Avenue, NW Bliss Road at NW 36th Avenue, existing WSU entrance and Salmon Creek Avenue, and the proposed new WSU entrance onto Salmon Creek Avenue.
4. Bridge Replacement: The existing bridge on NE Hwy 99, at NE 119th Street from NE 122nd Street was replaced.
5. I-205/Mill Plain Exit/112th Connector: This project would provide a direct connection to NE 112th Avenue from the off-ramp of northbound I-205 to westbound Mill Plain Boulevard. The project would give drivers a direct connection to NE 112th Avenue, completely bypassing Mill Plain Boulevard. This project is now under construction with an expected completion date of late 2009.
6. I-205/Mill Plain Interchange to NE 18th Street: Stage 1 would construct a segment of a new off-ramp that would eventually connect I-205 to NE 18th Street, and would be included with the construction of the I-205 - Mill Plain - 112th Connector project, which began construction in June 2008. Stage 2 would construct a partial interchange at I-205/NE 18th Street, and would include a system of grade-separated on- and off-ramps between Mill Plain Boulevard and NE 18th Street.
7. I-5/SR 501 Ridgefield Replacement Interchange: This project would improve safety and mobility by replacing the existing I-5 interchange at SR 501 in Ridgefield. It would include widening SR 501 to two lanes in each

direction, adding new turn lanes at the interchange, making improvements to the SR 501/56th Place and Pioneer Street/65th Avenue intersections, and adding bike lanes and sidewalks for pedestrian travel. Stage 1, which consists of reconstructing the existing I-5 interchange, will be advertised for construction in the summer of 2009. Stage 2, which consists of additional improvements to adjacent roadways will be constructed when funding becomes available.

8. SR 502/Widening from I-5 to Battle Ground: This project would widen SR 502 from two to four lanes from I-5 east into the city of Battle Ground. This project is currently in environmental review.
9. I-5/99th C-TRAN Park-and-Ride: This project was completed in late 2007.
10. Pioneer Street Extension: This project would extend Pioneer Street from 65th Avenue in Ridgefield to NE 10th Avenue (also known as 85th Avenue in Ridgefield). The anticipated completion date is unknown.
11. NE 10th Avenue: This project would widen NE 10th Avenue between NE 141st Street and NE 149th Street to one lane in each direction, with a center turn lane, sidewalks, bike lanes, and planter strips. Anticipated construction start date is 2015.
12. 179th Street improvements from NE 10th Avenue to 29th Avenue: This project would construct a principal arterial with two travel lanes each direction, center turn lane or median, bike lanes, sidewalks, and planter. The anticipated construction start date is 2016.
13. I-5/NE 179th Street Interchange Roundabouts – NW Delfel Road to NE 13th Avenue: This project would construct new multilane roundabouts to the west and east of the I-5 interchange at NE 179th Street. The project would also reconfigure the on- and off-ramps, and improve NE 179th Street to a 4-lane road. Design of this project is scheduled to begin in 2009.
14. NE 88th Street – NE Highway 99 to NE St. Johns Road: This project would improve NE 88th Street to a two-lane collector with a center turn lane, bike lanes, and sidewalks. Construction is anticipated to begin in 2013.

15. NE 88th Street – NE St. Johns Road to NE Andresen Road: This project would improve NE 88th Street to a two-lane collector with a center turn lane, bike lanes, and sidewalks. The project is currently under construction.
16. NE 119th Street – NE 72nd Avenue to NE 87th Avenue: This project would improve NE 119th Street to a four-lane minor arterial with a center turn lane/median, bike lanes, and sidewalks. Construction is anticipated to begin in 2012.
17. NE 119th Street – NE Salmon Creek Avenue to NE 72nd Avenue: This project would improve NE 119th Street to a two-lane minor arterial with a center turn lane/median, bike lanes, and sidewalks. Design and right-of-way acquisition is scheduled for 2012.
18. NE 94th Avenue –NE Padden Parkway to NE 119th Street: This project would improve/construct a two-lane arterial with a center turn lane/median, bike lanes, and sidewalks. The anticipated completion date is unknown.
19. NE Highway 99 – NE 99th Street to NE 107th Street: This project would improve NE Highway 99 to a four-lane principal arterial standard with a center turn lane/median, bike lanes, and sidewalks, and improve the intersection at NE 99th Street and NE Highway 99. The anticipated construction start date is currently unknown.
20. NE 99th Street – NE 84th Avenue to NE 117th Avenue (SR-503): This project would construct/improve NE 99th Street to a two-lane minor arterial with a center turn lane/median, bike lanes, and sidewalks. The anticipated construction start date is currently unknown.
21. New interchange on I-5 at SR-502: This project was completed in fall 2008.
22. Washington State University Campus Expansion: Anticipated completion year is 2028 (WSU, 2007).

7.2.5 How have the analyzed resources been historically affected?

Noise

Current noise in the vicinity of the Salmon Creek Interchange Project generally originates from traffic, commercial and industrial lands, construction activities, and other urban sources. Prior to 1983, these types of activities were less common than under current conditions. Population growth in the area has resulted in increased construction activities, high-

intensity land uses, and increased traffic, thus causing higher ambient sound levels. Currently, noise levels in portions of the project study area approach or exceed the WSDOT residential noise abatement criteria (see Section 6.2 for more information).

Land Use

Since 1983, farmland and open space has been replaced by residential housing, commercial and retail developments, and light industrial uses. Clark County was the fastest growing county in Washington State during most of the 1990s, averaging a 4.1 percent annual population and nonagricultural employment growth rate (Washington State Employment Security Department, 2001). Investment in manufacturing and industrial businesses, particularly in the high technology fields, electronics, and computer-related products, accompanied the population boom in the 1990s.

This growth eventually led to the enactment of a development moratorium in the vicinity of the project on July 26, 2005. This action was taken because the county code limits development when resulting traffic would cause transportation facilities to fail, and travel speeds in the Salmon Creek area had dropped below the established standards. In September 2007, the Board of Clark County Commissioners allowed the Salmon Creek moratorium to expire, partially because Phase 1 of the Salmon Creek Interchange Project was reasonably funded, and construction is expected to be complete within the next six years.

Wetlands

Historically, the Salmon Creek and Whipple Creek watersheds were farmed, and most native plant communities were either removed for crops or heavily grazed. Urban development expanded into this area at a high rate following 1983, and many of the wetlands were altered. Overland and subsurface flows were modified and some wetlands likely became dry while others increased in size due to changes in water movement. Roadways constructed to accommodate population growth bisected many of the drainages and included ditches to divert surface flow into storm drains and detention facilities. Currently, many of the remaining wetlands in the area are associated with roadside ditches and stormwater facilities. Remnant tracts of farmland and open space remain in the area, although these lands continue to be

replaced by residential housing and large-scale retail and office space developments.

Vegetation, Wildlife, and Fish and Aquatic Resources

Agricultural land practices prior to 1983 removed native plant communities for crops or subjected these communities to livestock grazing. Development that occurred following the completion of the I-205 Glenn Jackson Bridge further altered vegetation within the wetland and upland areas and limited the extent of available habitat. Much of the native vegetation has been removed or altered in the urban areas and areas near roadways due to development and maintenance activities. Wildlife present within the urban landscape depends on viable habitat for its survival. Habitat loss is a primary reason for species decline, especially in urban environments. Many wildlife habitat areas in the vicinity of the project study area are currently isolated by development or roadways, or are connected to other habitat through highly disturbed, narrow corridors, thereby limiting habitat availability and connectivity.

Loss of habitat is a major factor for fish population decline in the Whipple Creek and Salmon Creek watersheds. Human population growth in the area since 1983 has increased development, which has led to the degradation and elimination of aquatic habitat. Habitat alteration has resulted from loss of streamside vegetation, channel modification and bank armoring, installation of culverts, man-made migration barriers, and modifications to flows due to change in basin land cover. Stormwater runoff from the increased impervious surfaces within these watersheds has affected pollutant concentrations, base flows, and peak flows within receiving waters. Two of the salmonid stocks in the Salmon Creek and Whipple Creek systems, Salmon Creek coho and Salmon Creek steelhead, have been classified by the Washington State Salmonid Stock Inventory as "depressed." ESA-listed fish that may occur in the Salmon Creek system include Chinook, chum, coho, and steelhead. Coho and steelhead may also occur in the Whipple Creek system.

What is a "depressed" salmonid stock?

The Washington State Salmonid Stock Inventory defines a depressed stock as a fish stock with production below expected levels based on natural variations in survival levels, but above the level where permanent damage to the stock is likely.

7.2.6 Would the Salmon Creek Interchange Project contribute to any cumulative effects?

Noise

The project would increase noise levels at receptors located close to the improvement areas, although noise walls would be built as a component of the project to mitigate some of these effects. Increased noise would contribute to a cumulative effect on receptors in the vicinity of the project.

The project, in combination with other nearby projects, would affect noise in the area. Projects 1, 2, 3, 4, 11, 12, 13, 17, 21, and 22 considered for the cumulative effects analysis may contribute to a cumulative effect within the geographic boundary identified for noise during their construction and operation.

Land Use

Land uses in the vicinity of the Salmon Creek Interchange Project have progressed from open space and farmland to more high-intensity uses in recent decades. The project is not anticipated to contribute substantially to cumulative effects of growth and land development. Existing local and regional plans and policies help to control growth within the Urban Growth Boundary and ensure that planned development occurs with appropriate improvements to transportation facilities and other public infrastructure. Any changes to land use resulting from the transportation projects evaluated for the cumulative effects analysis would need to meet minimum travel speed requirements and other requirements established by Clark County.

Wetlands

While past urbanization of the Salmon Creek area has resulted in wetland losses, recent and continuing efforts by local and federal regulatory agencies are designed to preserve, protect wetlands, and ensure no net loss of wetlands. These efforts have restored and enhanced the value and function of wetlands in areas that are protected from future growth and development.

The project would temporarily and permanently affect wetlands. Wetland mitigation would occur within the Salmon Creek watershed, where all of the affected wetlands are located. Offsite mitigation would concentrate wetland

functions into a large site, thus improving affected functions on a watershed scale. Because more wetlands would be created or enhanced than permanently affected, the project would have a positive contribution to cumulative effects within the Salmon Creek watershed.

All of the projects evaluated for the cumulative effects analysis have the potential to affect wetlands within the Salmon Creek or Whipple Creek watersheds. However, regulatory requirements would promote avoidance and minimization of these resources, and compensation for any unavoidable effects.

Vegetation, Wildlife, and Fish and Aquatic Resources

The proposed project would contribute incrementally to the losses of vegetation, wildlife, and fish and aquatic resources in the area. Loss of vegetation near the interchange would further reduce and isolate available habitat. However, a majority of the affected vegetation would be disturbed herbaceous communities, which provides minimal habitat value. Habitat improvements at the offsite mitigation area would contribute to a positive cumulative effect on wildlife.

The project would include improvements to the existing stormwater treatment infrastructure. Despite an increase in impervious surfaces, improved treatment would reduce the pollutant loads to receiving waters and control influences on base and peak flows. Stormwater runoff from the project would have a minimal cumulative effect on fish and aquatic resources.

All of the projects evaluated for the cumulative effects analysis have the potential to disturb vegetation, wildlife, and fish and aquatic resources. Certain regulations protect effects to some habitats such as wetlands and streams, and require mitigation for these effects.

7.2.7 What measures are proposed to minimize cumulative effects?

Aside from the measures incorporated into the design of the project, no minimization measures are necessary.

7.3 Climate Change

7.3.1 How do transportation projects affect climate change?

Vehicles emit a variety of gases during their operation; some of these are greenhouse gases (GHGs). The GHGs associated with transportation are water vapor, carbon dioxide (CO_2), methane (also known as "marsh gas"), and nitrous oxide (used in dentists' offices as "laughing gas"). Any process that burns fossil fuel releases CO_2 into the air. Carbon dioxide makes up the bulk of the emissions from transportation.

Vehicles are a substantial source of GHG emissions and contribute to global warming primarily through the burning of gasoline and diesel fuels. National estimates show that the transportation sector (including on-road vehicles, construction activities, airplanes, and boats) accounts for almost 30 percent of total domestic CO_2 emissions. However, in Washington State, transportation accounts for nearly half of GHG emissions because the state relies heavily on hydropower for electricity generation, unlike other states that rely on fossil fuels such as coal, petroleum, and natural gas to generate electricity. The next largest contributors to total GHG emissions in Washington are fossil fuel combustion in the residential, commercial, and industrial sectors at 20%; and in electricity consumption, also 20%. Exhibit 7.3-1 shows the gross GHG emissions by sector, nationally, and in Washington State.

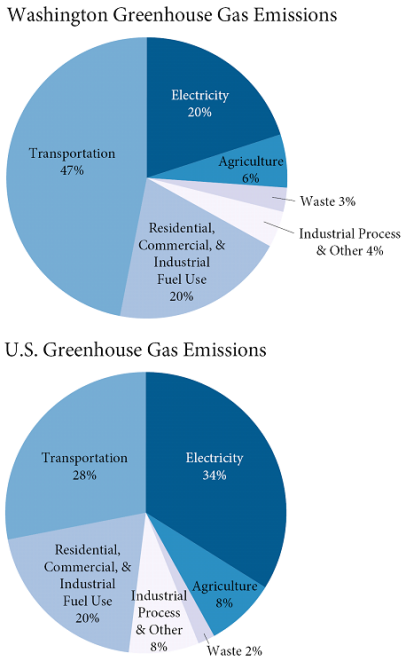

Exhibit 7.3-1. 2005 GHG Emissions by Sector in Washington State and Nationwide

7.3.2 What efforts are underway to reduce greenhouse gas emissions in Washington State?

In 2007, Governor Gregoire and the legislature set GHG reduction goals for Washington State:

- 1990 GHG levels by 2020
- 25% reduction below 1990 levels by 2035
- 50% by 2050.

Also in 2007, the Climate Advisory Team was formed by Governor's executive order 07-02 to find ways to reduce GHG emissions. The final report included 13 broad recommendations of actions.

In March 2008, the Governor signed Washington's Climate Change Framework/Green-Collar Jobs Act (HB 2815), which was developed with the help of a broad coalition of business, environment, education, labor, and energy leaders. This law includes, among other elements, statewide per capita VMT reduction goals as part of the state's GHG emission reduction strategy. This law also established the Climate Action Team, a group similar to 2007's Climate Advisory Team. This group refined 2007's broad recommendations into specific actions the state can take to reduce emissions.

Secretary of Transportation, Paula Hammond, was a member of the Climate Action Team. WSDOT staff served on subgroups focused on strategies to reduce vehicle miles traveled (VMT) and on how to include climate change in SEPA evaluations. The final report and other information on the process are available at: http://www.ecy.wa.gov/climatechange/2008CAT_overview.htm.

In addition to working with others in our state, WSDOT is leading the development of effective, measurable, and balanced emission reduction strategies. Current WSDOT activities that reduce GHG emissions include:

- **Transportation Options** – For 30 years, WSDOT has supported carpooling, vanpooling, and public transportation through the funding, building, and maintenance of the freeway HOV system, ferries, rail, and other programs. Our Commute Trip Reduction program has been partnering with employers to offer alternatives to drive alone commuting for 17 years and we have the nation's largest public vanpool program. These programs continue to expand and with recent high gas prices, demand has surged.

  These investments help reduce the number of vehicles on the roadway during peak congestion and help reduce total vehicle miles traveled.

- **Incident Response Team (IRT)** – WSDOT has 55 vehicles that patrol 500 miles of highway to clear blocking incidents quickly and safely. IRT clears 98.6 percent of all incidents in less than 90 minutes, reducing the amount of time motorists spend sitting and idling in traffic.

What does vehicle miles traveled (VMT) mean?

VMT stands for vehicle miles traveled and is the number of miles vehicles travel each year. For transportation projects with set boundaries, VMT can refer to the aggregate number of miles that all the vehicles travel using the specified roadways. Per person (or per capita) VMT in Washington has been stable at 9,000 miles per person since the 1980s, meaning the statewide VMT has grown at roughly the same pace as population. Methods of reducing VMT typically target transferring trips from single occupant vehicles to multiple person vehicles like carpools, vanpools, and transit. VMT can also be lowered by reducing the distance of travel through changes in land use.

- **Using Biodiesel in Ferries** – Each year, the state ferry system burns approximately 17 million gallons of diesel fuel in its ferries, making the agency a significant fuel consumer in Puget Sound. In March 2008, Washington State Ferries began testing the use of biodiesel in the marine environment. Using biodiesel instead of traditional petroleum-based fuels reduces emissions of particulate matter and greenhouse gases, improving both local air quality and the Earth's climate.

WSDOT is also taking action to reduce our agency's emissions. Two key elements of our internal effort are the agency's no idle policy and our expanded use of biodiesel. In 2006, WSDOT adopted a no-idle policy to reduce fuel use and vehicle emissions. We estimate by reducing vehicle idling by 50 percent, we can save as much as $500,000 annually in fuel costs. In 2005, WSDOT started using five percent biodiesel (B5) mixed with regular diesel in maintenance vehicles operating in the Central Puget Sound area. Currently, 25 WSDOT fueling stations have 10 percent biodiesel (B10) available and we are working toward using 20 percent biodiesel (B20), depending on availability.

Finally, the most valuable contributions are found in the delivery of well-planned transportation improvements. WSDOT and our partners are actively implementing the 2005 Transportation Partnership Act, a 16-year plan to meet Washington State's most critical transportation needs. Many of these local, regional, and statewide transportation system improvements, in conjunction with ongoing programs, help reduce the number of miles vehicles need to travel each year. Together these efforts combine to create more efficient driving conditions, offer mode choices, and help move us toward state GHG reduction goals.

7.3.3 What effect would the transportation improvements from the Salmon Creek Interchange Project have on greenhouse gas emissions?

In general, project-level actions that can help reduce greenhouse gas emissions include:

- Reducing stop and go conditions
- Improving roadway speeds to a moderate level

- Improving intersection traffic flow to reduce idling

Improvements proposed by the Salmon Creek Interchange Project would improve mobility. Reduction of stop-and-go conditions would help to conserve fuel and promote more efficient energy consumption by moderating speeds. The project would improve vehicle movement in 2030 for project area intersections and on the mainline, thereby improving mobility and reducing collisions. Decreased vehicle delay at on- and off-ramps would further reduce collisions and promote more efficient driving.

Construction of Phase 1 of the project is currently planned to last 3.5 years from 2010 to 2013. Phase 2 construction is expected to begin in 2015 and last approximately 2.5 years (2017), provided funding becomes available. The project traffic plan would include detours and strategic construction timing to continue moving traffic through the area and reduce backups to the traveling public to the extent possible. WSDOT would seek to set up active construction areas, staging areas, and material transfer sites in a way that would reduce standing wait times for equipment. WSDOT would work with partners to promote ridesharing and other commute trip reduction efforts for employees working on the project.

7.3.4 How would this project minimize emissions while under construction?

The anticipated construction start date for Phase 1 is 2010, and construction is estimated to be complete by 2013. Phase 2 construction is expected to begin in 2015 and last through 2017. WSDOT and Clark County would prepare and implement a Traffic Management Plan to continue moving traffic through the area and reduce backups during construction. WSDOT and Clark County would seek to set up active construction areas, staging areas, and material transfer sites in a way that reduces standing wait times for equipment. WSDOT and Clark County would work with their partners to promote ridesharing and other commute trip reduction efforts for employees working on the project.

7.4 Irreversible and Irretrievable Commitment of Resources

Implementation of the project would involve the commitment of natural, physical, human, and fiscal resources. In all of these categories, irreversible and irretrievable commitments of resources could occur; however, the importance of these actions would vary depending on the scarcity of resources and their ability to be reclaimed.

What are irreversible and irretrievable commitments of resources?

Irreversible and irretrievable commitment of resources refers to the permanent or long-term commitment of resources such as fuel, cement, steel, and conversion of land. These resources are not considered to be renewable.

7.4.1 What irreversible and irretrievable resources would be committed to the project?

The project would use energy resources, including gasoline and diesel fuels, for construction and facility maintenance. The amount of energy that would be consumed is a very small fraction of the energy consumed annually for transportation in Washington State and would not put substantial additional demand on energy sources or fuel availability in the region.

The project would also use steel, cement, aggregate, asphalt, and fill materials from local and regional sources. Quantities of these construction materials have not been determined at this time.

The transportation improvements would involve a long-term conversion of land resources to provide for new right-of-way. Land currently used for residential and commercial uses would be converted to transportation use.

Construction of the project would require committing federal, state, and local funds that are not retrievable.

The proposed commitment of natural, physical, human, and fiscal resources is based on the belief that businesses, employees, and residents of the immediate area and region would benefit from the improved quality of the transportation system. These benefits would consist of time savings, increased safety, and convenience through improved accessibility. These benefits are anticipated to outweigh the commitment of resources.

7.5 Relationship of Short-Term Uses of Environment and Long-Term Benefits

This section discusses the short-term effects on the environment from the project and the resulting long-term benefits.

7.5.1 What are the tradeoffs between short-term losses of environmental resources and long-term benefits from the project?

Short-Term Losses

Construction activities associated with the Salmon Creek Interchange Project would result in short-term effects to the environment. Some of these effects include a temporary increase in soil erosion, decreased water quality, increased noise levels, and increased particulate matter in the air. Once construction of the project is complete, these effects would diminish over a short period of time.

Construction activities (i.e., staging areas and work areas) would involve soil disturbance and the removal of vegetation. This could affect wildlife habitat and wetlands in the project area; however, the disturbance would be temporary and once construction is complete, the temporarily disturbed areas would be restored to preconstruction conditions.

The project would result in temporary traffic delays and a decrease in mobility during construction. Once the project is complete, traffic flow in the project area would be improved, resulting in improved mobility and traffic movement.

Long-Term Benefits

Though the Salmon Creek Interchange Project would have short-term losses of environmental resources related to construction activities, the long-term benefits provided by the project would result in a lasting net gain in mobility and safety.

While the number of vehicles would increase over time, overall traffic mobility would increase. With completion of the project, roadways would show improvements in travel speed. The NE 134th Street and NE 139th Street corridors are expected to comply with the minimum Clark County required speeds. Providing new access at NE 139th Street and alleviating the gridlock conditions on NE 134th Street would

eliminate ramp backups extending onto the I-205 and I-5 mainlines. Shifting the northbound on-ramp to I-5 from its current access to I-205 would reduce the amount of traffic-changing lanes in the section of I-5 between I-205 and NE 179th Street, reducing future collision risk.

Traffic flow and access to both freeways would improve and benefit residents of the area. Improved interchanges would also improve mobility, thereby improving travel times. Safety upgrades and pedestrian connection improvements, such as the addition of bike lanes and sidewalks, would benefit all who live and work within Salmon Creek communities. Additionally, improvements to mobility and accessibility and upgrading the safety and access to pedestrian/bicycle linkages would support community cohesion. Crosswalks, sidewalks, and bike lanes associated with the proposed project would have a positive effect on cohesion and may encourage residents to walk or bike more often.