Appendix L Greenhouse Gas 4-part Strategy

Supplementary information regarding options for further reducing greenhouse gas emissions in the Puget Sound region

State and Federal Greenhouse Gas Emissions Reduction Directions

Greenhouse Gas Reduction Goals: The State of Washington has adopted greenhouse gas (GHG) emission reduction goals for the state to reduce emissions to 1990 levels by 2020, 25% below 1990 levels by 2035, and 50% below 1990 levels by 2050. These goals are overall statewide reduction goals, across all sectors and sources of emissions. While these goals are enacted in state law, the state has not yet assigned targets for the regions of the state, nor for individual sectors (transportation, energy, housing, etc.). The federal government has also not yet set national GHG reduction goals, and current federal legislation being considered by Congress would require specific state goals and targets at least 2 years beyond the enactment of federal legislation.

In the absence of specific requirements and guidance, the Puget Sound Regional Council (PSRC) Transportation Policy Board has taken a proactive stance to address the state's climate change goals in the Transportation 2040 Update process. Each alternative analyzed according to State Environmental Policy Act (SEPA) rules was evaluated for GHG emissions as well as total and per capita vehicle miles traveled (VMT). The data produced from this evaluation process helped to inform the region and state on the potential benefits of a combination of transportation strategies in reducing emissions and VMT.

Based on PSRC's analyses and research, as well as data and research conducted at the national level, Transportation 2040 includes a Four-Part Greenhouse Gas Strategy. Recognizing that it will require a variety of strategies and tools to effectively reduce emissions from the transportation sector, the four-part strategy contains the following elements:

- **Land Use**: build upon the VISION 2040 Regional Growth Strategy to further the goal of balancing jobs and housing, and pursue additional refinements through strategies such as transit-oriented development.
- **User Fees**: recognizing its critical role in reducing VMT and emissions, transition the region over time to a user fee/roadway pricing system.
- **Choices**: continue to provide travelers options to the single-occupant vehicle, and continue research into the costs and benefits of various strategies.
- **Technology**: recognizing that improvements to vehicles and fuels will play a crucial role in reducing emissions, PSRC has undertaken research with the Washington State Department of Ecology (Ecology) on the potential technological advances that may be likely in our region by the year 2040.

Transportation 2040 includes programs and investments that encompass all four of these strategies; these investments are described in more detail later in this document.

State Vehicle Miles Traveled Reduction Benchmarks: The state of Washington has also enacted VMT reduction benchmarks. These benchmarks are not requirements, but were enacted to encourage measurement of VMT as part of an overall greenhouse gas reduction strategy. In early 2009, Governor Gregoire issued an Executive Order, which requires a collaborative process to review the VMT reduction benchmarks and report on whether they should be changed, especially related to alternative fuel vehicles, and the economic and other impacts of VMT reduction benchmarks. The report is due by the end of 2010. The analysis conducted for Transportation 2040 has demonstrated that VMT per capita in the region is already meeting the State's 2020 benchmark, and additional reductions for all alternatives are estimated by 2040 (Refer to Chapter 6 for more information). Given this state directive, PSRC is reporting progress on VMT reduction and has incorporated specific actions within the four-part greenhouse gas strategy to support VMT reduction.

PSRC continues to work with the Washington State Department of Transportation (WSDOT), other metropolitan planning and regional transportation planning organizations around the state, and additional stakeholders on the requirements of Governor Gregoire's executive order.

Transportation 2040

The Transportation 2040 alternatives contain elements of the Four-Part Greenhouse Gas Strategy, including land use actions, roadway pricing, providing more transportation choices, and vehicle and fuel technology. Each of these strategies are discussed below:

Land Use: The region will achieve the adopted growth strategy, VISION 2040. Analysis conducted for the development of VISION 2040 indicates that the increased shift to a more centered growth pattern, and a better jobs/housing balance within the four counties embodied within VISION 2040, will reduce GHG emissions by about 6% from the trend[1].

Pricing and Choices: The Transportation 2040 alternatives use four pricing strategies that would have the effect of reducing vehicle travel, and therefore, GHG emissions.

> **1. Tolling individual freeway segments:** The first strategy is tolling of individual roadway segments, first converting most high-occupancy vehicle (HOV) lanes to high-occupancy toll (HOT) lanes, and then tolling individual freeways where capacity will be added. The tolling is assumed to be variable by time of day to reduce peak period travel and congestion, and the overall effect of tolling is to reduce unnecessary travel and overall vehicle travel. Assumed toll rates were set at levels that would optimize use of the system (while minimizing negative arterial diversion) and maximize benefits to system users.
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> **2. Substituting a VMT fee for the gas tax:** A gas tax substitute, such as a VMT fee, could be implemented. The VMT fee has a more direct link to amount of travel compared with the gas tax, providing drivers with more direct information on how much they travel. This approach has been demonstrated to reduce the amount of travel.
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> **3. Freeway System Tolls:** All regional freeways could be tolled to raise money for transportation investments and to manage the limited capacity of the system. It is assumed that the freeway system toll will be variable, with higher toll rates during the peak commute times, and a minimal or no toll at night and other non-congested times. Toll rates were set to optimize use of the system and to maximize benefits to the system users. This translates to an average toll of about 18 cents per mile.
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> **4. Parking Surcharges:** Additional parking surcharges could be implemented in major regional employment centers.

The above pricing approaches, supported by a 120% increase in local transit service and the extension of regional light rail to Everett, Tacoma, and Redmond, plus investments in walking and biking facilities within and accessing centers and transit stations, together result in a 9% reduction in regional GHG emissions from the trend.

Technology: Assumptions about the market penetration of electric and other alternative fuel vehicles, less carbon-intensive fuels, and improved fuel efficiency of the overall passenger and freight fleets could further reduce GHG emissions. In collaboration with Ecology, PSRC developed two technology scenarios: a "likely" scenario, which is probable given current trends and conservative assumptions about fuel prices and other incentives to change technology, and an "aggressive" scenario, which assumes a higher degree of concerted effort to transition the vehicle fleet to a more energy-efficient approach. These scenarios, based on extensive national research and prepared in consultation with the U.S. Environmental Protection Agency (U.S. EPA), WSDOT, and the Puget Sound Clean Air Agency, are

[1] The value referenced here is obtained from the analyses conducted for the VISION 2040 Environmental Impact Statement. The alternatives analysis for VISION 2040 evaluated various growth patterns compared to the historic trend, using the investments contained in the existing long-range transportation plan, *Destination 2030*.

identified in the chart below. The "likely" scenario could result in an additional 25% reduction of GHG emissions, and the "aggressive" scenario could result in an additional 43% reduction in emissions.

Potential Vehicle and Fuel Technological Improvements in the Central Puget Sound Region by 2040

	LIKELY SCENARIO	AGGRESSIVE SCENARIO
Percent of Electric Vehicles in Fleet	20%	45%
Improvements to Fuel Economy	40 mpg	50 mpg
Reduction of Carbon Intensity of Fuel	10%	25%
Improvements to Heavy Duty Vehicles	5%	10%

Four-Part Greenhouse Gas Strategy: Next Steps

PSRC has taken a proactive stance at addressing the reduction of GHG emissions, beginning with the multicounty planning policies and the Regional Growth Strategy contained in VISION 2040 and continuing with the analysis work and investment strategies contained in Transportation 2040. This is an emerging area, with research and legislation continuing to evolve at both the state and national levels. PSRC's Boards have directed that Transportation 2040 should be flexible and adaptable in order to respond to new guidance and directions on a variety of issues, including climate change.

The Transportation 2040 alternatives contain elements of each of the four components of the Four-Part Greenhouse Gas Strategy. Additional research and analysis could be conducted in each of these areas, such as the following:

Land Use: VISION 2040 resulted in a 6% reduction in GHG emissions from the trend. From the VISION 2040 Environmental Impact Statement (EIS), further focusing growth in metropolitan and larger cities could result in up to a 9% reduction in GHG emissions.

User Fees and Choices: The transportation investments in the Preferred Alternative result in a 9% reduction in GHG emissions from the 2040 Baseline. Higher assumptions of vehicle operating costs would result in additional reductions, for example:

- The toll rates in Alternative 5 were higher (25¢ per mile) and resulted in a 10% reduction in GHG emissions from the Baseline.
- Other sensitivity tests of higher vehicle operating costs (an additional 19¢ per mile, equal to approximately an additional $4.00 a gallon) indicated the potential for further reductions of GHG emissions in the range of 7% to 10%.
- A sensitivity test that involved increasing urban bus services in coordination with the road tolls analyzed in the Draft EIS alternatives indicated the potential for further modest reductions in GHG emissions, in the range of 0.2%.
- The report Moving Cooler[2] analyzed fees equivalent to an *additional* $5.00 a gallon, which resulted in a 28% reduction in GHG emissions from their study baseline by 2050.

The alternatives analysis conducted for Transportation 2040 included significant investments in alternatives to single-occupant vehicle travel, consistent with the 2008 Washington State Climate Action Team's recommendations[3]. Additional research could be conducted regarding the impact of the region's "short trips," as well as the benefits of localized bicycle and pedestrian investments, active traffic management, transportation demand management (TDM) programs, etc.

[2] Moving Cooler, an Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions, Cambridge Systematics, Inc. 2009.

[3] As published in Leading the Way: Implementing Practical Solutions to Climate Change, November 2008.

Technology: The application of likely and aggressive technology improvements to the Preferred Alternative results in a total GHG emissions reduction between 5% and 28% below 2006 levels. To ensure that these potential emissions reduction benefits are achieved, the region and the state should consider opportunities to influence the direction of vehicle and fuel improvements over the next 30 years, for example, through legislation or incentives.

SUMMARY

The results from the strategies and investments contained in the Transportation 2040 Preferred Alternative are consistent with state and national research related to the reduction of GHG emissions from the transportation sector. The 2008 Washington State Climate Action Team report, Leading the Way: Implementing Practical Solutions to the Climate Change Challenge, makes the following statements:

- "Two objectives are key to achieving the state's goals for GHG emission reductions: 1) a binding GHG emissions limit, and 2) alignment of market incentives to support achieving that limit."
- "In order to meet the 2020 targets and achieve the longer-term GHG emission reduction targets, a "centerpiece" market-based policy must be aligned with these limits to deliver cost-effective solutions and drive the broad structural changes needed to achieve a flourishing low-carbon economy. The sector-specific "most promising" policies recommended here can complement, but cannot supplant, this centerpiece policy; but they alone cannot (and are not intended to) achieve the longer-term goals in the absence of this market signal."

Further, of the 14 "most promising strategies" recommended in the 2008 Climate Action Team report for all sectors, 10 were quantitatively analyzed for their emissions reduction potential. These 10 strategies were estimated to be able to reduce GHG emissions by 10% below forecasted 2020 levels.[4]

In addition, it is nationally recognized that all possible strategies are required to effectively reduce emissions from the transportation sector:

- "Meeting long-term climate protection goals will require significant progress on all three legs of the stool." Center for Clean Air Policy
- "Independently, each approach appears to have the potential to significantly reduce GHG emissions from the transportation sector, but not enough to flatten emissions. When the approaches are combined however, there are even greater opportunities and added flexibility to reduce emissions." U.S. EPA
- "For the U.S. transportation sector, system approaches that combined advanced vehicle technology, lower GHG fuels, and TDM yield the largest potential and flexibility for lowering both GHG emissions and petroleum use." U.S. EPA

As mentioned previously, this is an emerging issue with numerous state and federal activities in process, including potential future federal legislation. PSRC will continue to move forward on its Four-Part Greenhouse Gas Strategy and will continue to collaborate with other agencies and monitor this important issue.

[4] Page 49, Leading the Way: Implementing Practical Solutions to Climate Change, November 2008.