Washington State Department of Transportation

Washington Transportation Plan

Health and Environment

How can transportation investments be developed, implemented, and used in ways that both enhance our citizens' transportation goals and our citizens' goals for healthy communities and a well-protected environment?

Transportation systems touch many complex health and environmental concerns, including human health, natural ecosystem processes, species protection, climate change, and land use.

WSDOT's environmental enhancement efforts take their cues from citizen expectations that have been captured over time in federal, state, and local environmental regulations and policies. Public discussion of emerging issues, advances in scientific knowledge, and the evolution of transportation practices further direct our efforts.

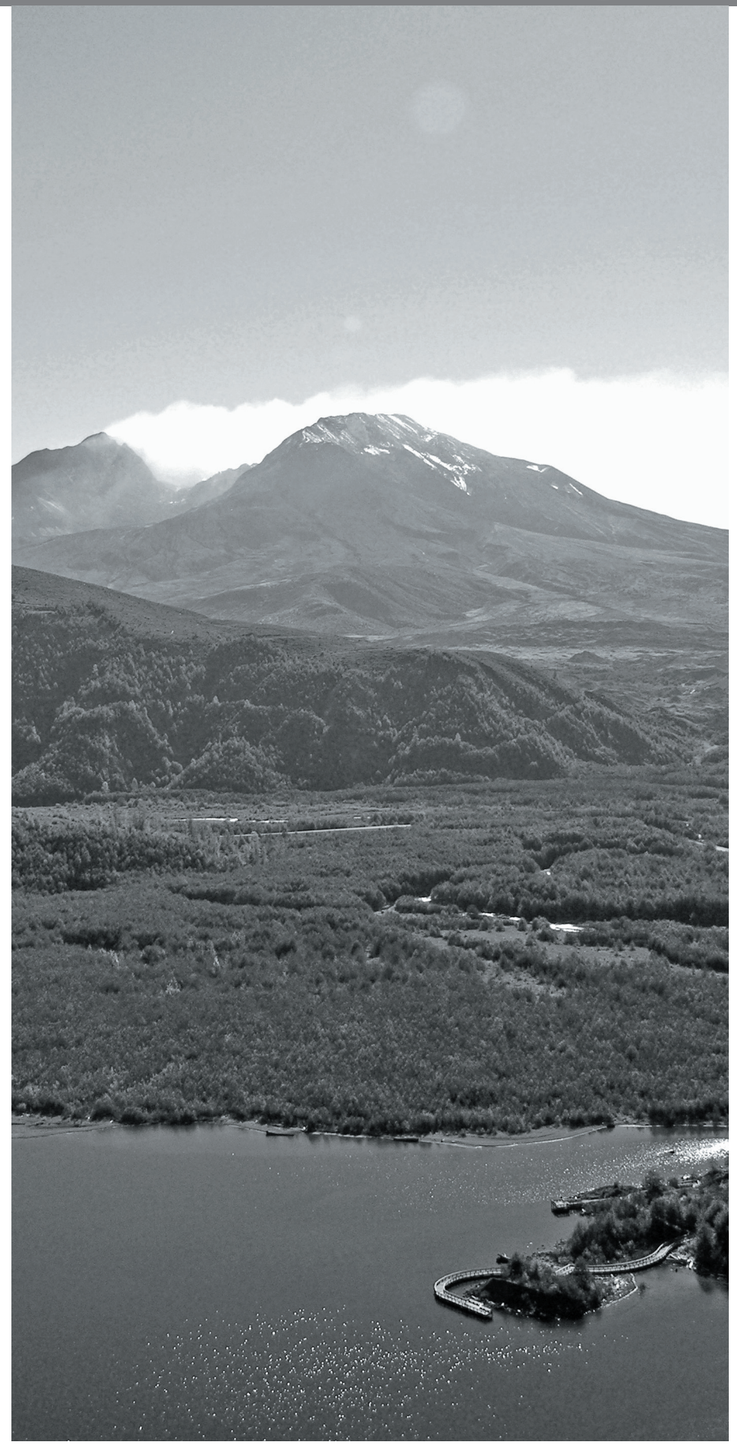
WSDOT's overarching transportation goal related to human health is improving the safety of users of the transportation system. Beyond that core principle, WSDOT recognizes its role in protecting and sustaining the natural environment and the cultural and historic resources that are also critical to our quality of life. The Health and Environment paper explores five ways that transportation systems interact with communities and the environment:

- Air quality
- Active living and healthy communities
- Noise issues for highways and ferries
- Stormwater runoff
- Protecting and connecting habitat

An analysis of growth management trends and policy recommendations will be released as a stand-alone paper at a later date.

Protecting Washington's water supply, air quality, natural ecosystems along with other efforts to sustain the abundant natural setting of this state is no small task and will require the efforts of every citizen. For a fuller description of WSDOT's environmental work, visit:
www.wsdot.wa.gov/environment

For up to date environmental reports, visit:
www.wsdot.wa.gov/accountability



Emerging Directions

Automobiles and Sprawl

- One state growth management goal is to reduce sprawl, and transportation expansion projects are often discussed and debated in connection with sprawl. Is it appropriate to address sprawl on a project-by-project basis, as currently required by federal environmental review laws, or should it be addressed in a more systematic way? A systems approach for addressing the cumulative effects of transportation projects and induced growth issues is needed.

Healthy Communities

- WSDOT places a priority on improving pedestrian and bicycle safety through the construction of sidewalks, trails, crosswalks, medians, and other features, particularly when it results in increased opportunities for children and others to be physically active and reduces environmental impacts. To continue to improve conditions for biking and walking, state resources for pedestrian safety will focus on locations that improve modal connections, specifically transit access. Existing resources for paths and trails will be applied to statewide priorities with a focus on improving safety for the young and the old.

Improving Air Quality

- The transportation sector is the source of more than half of the state's carbon dioxide emissions. The governors of Washington, Oregon, and California have begun to develop strategies to reduce carbon dioxide emissions in their states. The two ways to reduce transportation's carbon dioxide emissions are to improve vehicle technology and to reduce driving. California is proposing new carbon dioxide standards for cars and light trucks, beginning in 2009. The Washington State Legislature and Governor passed legislation to adopt the California standards in 2005.

Greater Returns on Investments

- The watershed approach involves looking at watershed needs and improvement opportunities beyond the immediate area of a project. In some watersheds, dollars can be better spent to deliver large benefits to water quality protection and habitat conservation and enhancement by investing in stormwater and wetlands needs away from the highway, compared to localized mitigation by the highway. This strategy continues to be developed.

Managing Stormwater

- The stormwater retrofit program addresses some of the highest priority stormwater deficiencies, but the program remains largely unfunded. In the WTP update, WSDOT will examine the environmental performance of existing facilities and propose methods to address deficiencies. In order to determine what to fix first, WSDOT needs to continue to inventory its outfalls and stormwater facilities. Only when the inventory is more complete can the highest priorities and most cost-effective locations be identified.

Protecting and Connecting Habitat

- WSDOT is addressing the need for habitat connections in the design of several projects, including SR 240 near the Tri-Cities, the I-90 Hyak to Easton project in the Cascade Mountains, and the Cross-Base Highway in Pierce County. Careful analysis is needed to determine the highest priority locations where investments should be made for connectivity, and habitat data needs to be better integrated into transportation planning and design. Integrating habitat planning and transportation planning is a key challenge for this WTP update. At the same time, existing retrofit programs for fish passage and chronic environmental deficiencies need more dedicated funding to address existing problems on the state highway system.

The Washington State Transportation Commission and the Washington State Department of Transportation are in the process of updating the Washington Transportation Plan. This long range plan is based on data analysis and is focused on ten issues: System Preservation, System Efficiencies, Safety, Transportation Access, Bottlenecks and Chokepoints, Economy and Jobs, Moving Freight, Future Visions, Health and Environment and Funding and Governance. This plan will shape future transportation budget proposals.

For more on this topic: **www.wsdot.wa.gov/planning/wtp**

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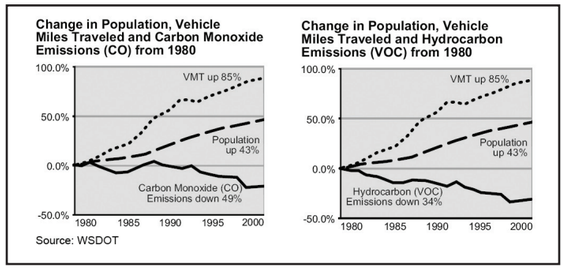
Environmental & Health Trends in Washington

Air Quality

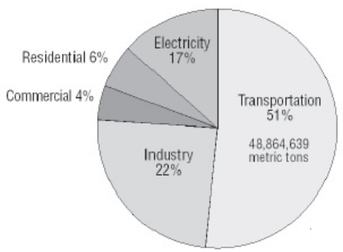
Emissions associated with transportation – from cars, trucks, buses, cargo vessels, cruise ships, ferries, and trains – are major sources of local air pollution and greenhouse gases. Air quality trends for regulated pollutants have improved over the past few decades, even as the state's population and vehicle miles traveled have increased.



However, concerns are growing in the areas of unregulated air toxics and inhalable soot ($PM_{2.5}$) related to diesel exhaust. While scientific study of the health effects of diesel continues to evolve, it is generally understood that prolonged exposure to these fine particles lead to respiratory and other health problems. Steps already taken in the regulatory arena (low sulfur diesel fuel and new exhaust systems in heavy trucks) and in Washington State (the recent move to low sulfur diesel in all state ferries) have helped to reduce $PM_{2.5}$ emissions by more than 20 percent from 1980.

Another emerging trend is the share of carbon dioxide (CO_2) produced by transportation sector. Because Washingtonians rely less on fossil fuel for electricity generation, our vehicles are the largest source of CO_2 emissions.

Carbon Dioxide Emissions in Washington State by Source, 2000



The opportunities to constrain CO_2 emissions from motor vehicles lie in:

- Increasing fuel efficiency
- Converting to less polluting technologies
- Holding down vehicle miles traveled

WSDOT and other state and federal agencies are working together to respond to these issues.

Healthy Communities

Transportation not only determines how we move from place to place, but also the character of our communities. There is an increasing body of research suggesting that automobile-oriented land uses (e.g., those that create auto dependency) limit transportation options, adversely affect air quality, water quality and safety, and discourage physical activity.

Some of the most compelling new research related to transportation and healthy communities has shown that:

- Children's walking trips to school have declined by 40 percent between 1977 and 1999, and children between the ages of 5 and 15 make only 10 to 12 percent of their school trips by walking or riding their bicycles.
- Nearly a third of our nation's children and adolescents are overweight or at risk of becoming overweight. This proportion has more than doubled over the past 20 years.
- One half of all trips people make are less than three miles, but most of these are made by car.
- People walking and biking on the road face disproportionately high risks as 13 percent of all traffic deaths are pedestrians.

Access to sidewalks and bike paths as well as transit friendly land use patterns can improve our health and the health of our communities by helping to improve air quality and providing more opportunity for physical activity.

Reducing Highway Noise

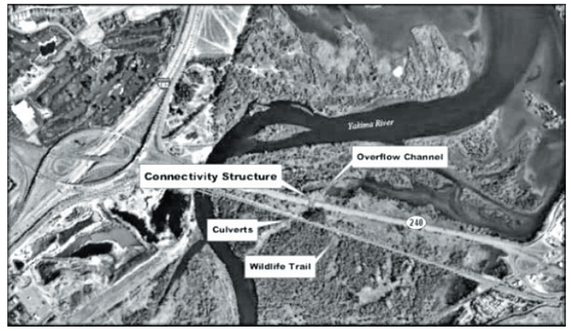
Traffic can create a lot of noise, sometimes at levels that are unacceptable for nearby neighborhoods. Though WSDOT cannot provide sound barriers everywhere, federal law and state policy requires that every project that adds through-lanes or significantly realigns roadways must receive a noise evaluation. Outdoor noise impacts (more than 66 decibels) on locations such as homes, schools, churches, day cares, and hospitals trigger evaluation of whether noise mitigation (e.g., walls, earth berms) will be meaningful and cost-effective. The result is that WSDOT builds many noise barriers that generally halve residents' perception of traffic noise. From 1963 to 2000, WSDOT built approximately 65 miles of noise barriers throughout the state.

Before 1976, noise was not accounted for on highway projects. WSDOT's noise retrofit program allows placement of barriers on existing highways where homes existed before May 1976. More than seventy locations are on the priority list, subject to funding.

Protecting Habitat and Wetlands

Washington State has a wide diversity of habitats that support more than 650 native fish and wildlife species. As the population increases, and our human footprint expands, added pressure is placed on natural systems that are already heavily stressed in many cases. Habitat fragmentation, road kill, and wetlands loss are some of the impacts that transportation systems can cause.

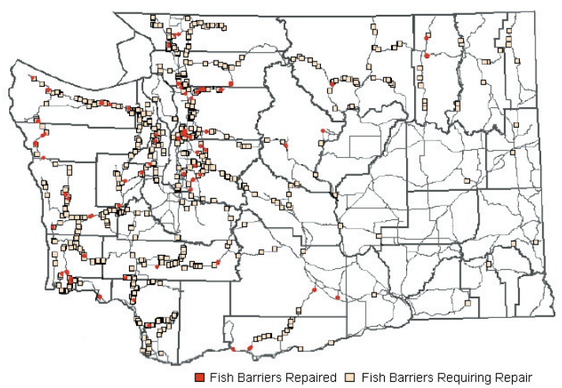
Roads can fragment habitat for fish and wildlife, restrict the movement of wildlife across landscapes, and lead to vehicle collisions with wildlife (on average, 1,200 reported accidents, 134 injuries, and one fatality each year – in 2004, five people were killed in vehicle-wildlife collisions).



Highway 240 near Tri-Cities: Additional structures allow for high water flows as well as enhanced wildlife movement in a wildlife refuge.

Nearly 900 WSDOT fish barriers have been identified for correction. The Washington Department of Fish and Wildlife has estimated there are another 33,000 non-WSDOT fish passage barriers located on city, county, federal, private, and tribal roads. So far, 140 WSDOT fish barriers have been fixed during the construction of a larger highway project, routine maintenance, or through the fish barrier retrofit program. Since 1991, 370 linear miles of stream habitat have been restored.

Fish Passage Barriers on State Highways



WSDOT adheres to wetlands protection requirements under Section 404 of the Clean Water Act and numerous state and local environmental provisions. At the same time, WSDOT is working with others to improve the effectiveness of wetlands protection and replacement requirements through opportunities for "watershed-based mitigation."

This and many other important efforts, such as water conservation, herbicide use reduction, and native plantings along roadsides, can be found at www.wsdot.wa.gov/accountability/graynotebook.

Construction projects affecting wetlands can avoid or minimize impacts by selecting a different alignment, widening bridge structures, or adding retaining walls that limit the need for fill. To compensate for unavoidable wetland impacts, WSDOT has developed 116 mitigation sites, totaling 675 acres since 1987. Of the 53 sites (272 acres) that have completed monitoring since 1988, 49 (267 acres) have been judged successful.

Stormwater Runoff

When stormwater flows over roads and through roadway drainage systems, it carries pollutants originating from motor vehicles, the atmosphere, and other sources into surface water bodies. Sediments and pollutants (nutrients, oil, grease, metals) are carried into rivers and streams in this way, affecting the quality and health of the water for people, animals, and plants.

Typical Sources of Pollutants in Urban Runoff

	Highways	Residential	Commercial/ Industrial
Phosphorus	4%	39%	53%
Hydrocarbons	16%	28%	54%
Copper	9%	10%	79%
Suspended Sediments	7%	44%	44%

Source: NPDES Municipal Stormwater Permit Application, Volume I, Portland OR Metropolitan Area, May 1993

Controlling the amount of flow is also important, as high flows can damage habitat, property, and transportation infrastructure. Managing stormwater flowing over transportation facilities is achieved through use of runoff treatment and flow control. Most of WSDOT's stormwater outfalls were built prior to stormwater regulations and have no treatment facilities. To date, only 4,000 of WSDOT's estimated 18,000 to 24,000 outfalls have been inventoried, so adequate data is lacking to prioritize outfalls for retrofit.

At the current rate of construction, it will take at least a century to fix all of the locations lacking treatment facilities.