

Health and the Environment

Investing in our transportation systems can help align citizens' goals for a healthy environment. Environmental elements are considered part of every project's design, construction, operation and maintenance.

Highway construction projects are designed to:

- » Treat stormwater by removing sediments and metals
- » Protect the quality of groundwater
- » Control erosion of banks and reduce surface run-off
- » Provide fish passage and enhance habitat connections
- » Build barriers to reduce noise on neighborhoods
- » Replace and improve wetland functions
- » Protect cultural and historic resources
- » Minimize air pollution
- » Allow habitat connectivity for animals
- » Provide Bicycle/Pedestrian Facilities as needed.

WSDOT plans to continue investing in stand-alone environmental retrofit projects to fix problems along the existing highway system.

These projects are funded to:

- » Remove culverts that keep fish from reaching upstream habitat
- » Reduce highway noise in areas not addressed by past construction projects
- » Treat stormwater
- » Fix stretches of highway that suffer repeated flooding or streambank erosion
- » Provide pedestrian crossings near schools, senior centers, and parks
- » Provide bicycle connections near schools and in urban areas

Seven Core Elements to WSDOT's Environmental Management Systems

- » Legal and other requirements clearly outline all environmental laws, regulations, and agreements that apply to operations.
- » Written procedures instruct staff and contractors how to conduct work activities in compliance with requirements.
- » Training ensures those that conduct certain activities know how to do the work in a compliant manner.
- » Roles and duties ensure WSDOT staff and contractors know what they are to do under the EMS.
- » Inspection, monitoring, and corrective action ensure a process is in place to check WSDOT's work for compliance and correct any problems.
- » Documentation allows WSDOT to evaluate the operation of the EMS, and communicate results to the public and within the department.
- » Performance measurement compares WSDOT's performance against pre-determined targets, with results reviewed by management and reported to the public.

Fish Passage Barrier Retrofit

What is the Problem?

Salmon and other fish need access to freshwater habitat for spawning and juvenile rearing. Undersized road culverts act as barriers, blocking fish from habitat.

A state program identifies and fixes fish passage barriers on state highways (recent funding boosts this program). There is currently no statewide program to identify and fix barriers on non-state roads.



Vision for the Fish passage Barrier Removal Program

1. What is the problem and how do you find it?

Highway culverts can act as barriers to fish passage that may keep salmon and trout populations from accessing their historic rearing and spawning grounds. Prior to WSDOT establishing its fish passage barrier removal program, there was no way to fund stand alone fish barrier correction projects. In 1991, WSDOT established a programming process to propose stand alone fish barrier removal projects to the Legislature.

WSDOT contracted with the Washington Department of Fish and Wildlife (WDFW) to inventory, identify, and prioritize state-owned culverts that are fish passage barriers. To date, WDFW has inspected 5,853 highway stream crossings and have identified 1,538 WSDOT-owned fish passage barriers where modifications to the culvert or other water crossing would result in significant fish habitat gain. We have removed 180 of these barriers and over 411 miles of stream habitat has been reclaimed for fish use.

2. What is our vision for the Fish Passage retrofit program and where do we want to be in 10 year, 20 years? (THIS SECTION IS STILL A WORK IN PROGRESS).

WSDOT’s long-term goal is to correct all fish passage barriers. Our strategy is to correct the highest priority fish passage barriers first. Some barrier corrections provide more habitat gain than others and projects to correct the barrier can vary widely in cost. The highest priority barriers are those that open up the greatest amount of high-quality fish habitat at the lowest cost. The rate of barrier correction also depends on the amount of funding WSDOT has for the barrier removal program.

Existing funding:

TPA:

Our vision (or what we’d like to do if we had the money): In 20 years, we would complete 40 percent of the barriers to gain 80 percent of the highest quality habitat.

3. How do we prioritize the retrofit work?

WDFW evaluates and prioritizes WSDOT culverts identified as barriers to fish passage and establishes a Priority Index (PI) for each project. Projects are prioritized so that the first culvert barrier corrections are those that provide the greatest habitat benefits to fish. The PI takes into account the habitat gain, mobility and health status of the fish stocks that would benefit from the increased habitat, and the projected project cost. Barriers that rate the highest are those that benefit the most species and open up the most habitat.

4. How do we characterize the benefits? What are our performance measures? What are our links to current initiatives (executive order, governmental goals, policies, etc).

We characterize benefits as the square meters of habitat opened up for salmonid use as a result of barrier removal. WDFW inspects each corrected barrier the first year after construction. Each project is checked for fish passage use, and certain sites are selected for long term studies to see if fish use continues and whether the design of the structure is working as intended. As of May 2006, more than 1,752,387 square meters of salmonid habitat, or over 662 linear kilometers (411 miles) has been reclaimed.

Correction of WSDOT fish passage barriers directly supports statewide salmon recovery efforts. In addition, barrier correction may also help reduce repetitive maintenance activities.

5. Maps

GIS maps of identified WSDOT fish barrier removal projects have been created and are available as overlays.



Jimmycomelately Creek: A new bridge replaced a double box culvert.

2005 Legislative Action

\$20 million for fish passage barriers on state highways.

WTP says “\$188 million to remove 900 barriers”

Ability to meet goal of fixing all barriers (nearly 900 sites require fixes on state highway system).

Description of Proposal

Assess whether projected funding over the next 12 years for the Fish Passage Barrier Retrofit program will adequately cover the need on state facilities.

Develop a strategy to address barriers on tribal, county and city roads.

Description of Benefits/Impacts of Implementing the Proposal

Correcting fish passage barriers like roadway culverts is one of the most effective ways to improve streams for fish habitat conditions.

WSDOT Fish Passage Barrier Removal Plan

WSDOT has been evaluating and correcting state highway fish passage barriers using a three-pronged approach. First, it designates dedicated (I-4) funding to correct the highest priority fish passage barriers within the Environmental Retrofit Program’s Six Year Plan. Second, as road projects are constructed, additional fish passage barriers are removed whenever a Hydraulic Project Approval (HPA) is required. Combining fish passage restoration with road project construction decreases costs eliminating duplication in equipment and personnel mobilization. And third, some fish passage barriers are corrected as a result of routine maintenance on failing culverts.

Fish Passage Barrier Correction with Dedicated I-4 Funding

Each biennium dedicated funding within the WSDOT Environmental Retrofit Program (I-4) budget is set aside for correction of ranked, high priority fish passage barriers identified during the WSDOT inventory. Projects are prioritized to provide the largest gains in habitat and the greatest production benefits for both migrating and resident fish species. Many factors determine a project’s priority including: the degree of passage improvement, potential increase in production for specific species resulting from the gained habitat, amount of habitat gained, benefits or drawbacks from increased mobility to species present, stock status of species present (WDFW Salmonid Stock Inventory, SaSI), and cost of the project. All the factors are consolidated in a numeric Priority Index (PI) model, which provides an objective priority ranking for each project. These projects are contained within the Washington State Department of Fish and Wildlife (WDFW) Fish Passage and Diversion Screening Inventory Database.

Project Costs

Over the last 20 years WSDOT has spent approximately \$2.2 million for repair work at this site.

One alternative considered was to realign U.S. 101. Estimated project costs were \$10.0 million and did not include mitigation costs for major environmental impacts.

Total project costs were approximately \$7 million. Eighty-seven percent of the project costs were paid by the Federal Highway Administration.



Before Construction - Flooding at the Hoh River erodes the shoulder of U.S. 101



July 2004 - Beginning of Construction



August 30, 2004 - Logjam construction progress



September 28, 2004 - Hoh River After Construction



Ecology embankments (highlighted in the December 31, 2002 Gray Notebook, p. 21) are grass covered filters built into the highway shoulder to remove pollutants from runoff. Embankments are ideal for situations in which limited land is available.

Prioritization for Chronic Environmental Deficiencies (CED) Projects

Methodology

Prioritization for chronic environmental deficiencies projects was developed by comparing several key factors pertaining to the severity of each problem site including:

- » Likely recurrence interval of damage
- » Presence of fish
- » Presence of Endangered Species Act listed fish
- » Number of species impacted
- » Habitat type impacted
- » Size and severity of impact area

For the 05-07 Biennium this evaluation was largely qualitative. A more quantitative methodology has since been developed that uses the same criteria in a statistical format, which will reduce the subjectivity of the evaluation and prioritization process.

Stormwater

Transportation agencies have come a long way toward aligning citizen’s goals for a clean and healthy environment with meeting their transportation needs.

Today’s highway construction projects integrate environmental components into project design, budget, construction and operation. We are now making major investments in erosion control protection and stormwater treatment. This is in response to specific permit requirements as well as best practices that demonstrate our environmental commitment.

Public discussion of emerging issues, advances in scientific knowledge, and evolving practices also inform us of additional needs and priorities.

Improving our Performance: Stormwater Management

Today’s focus is on managing stormwaer runoff for flow control and pollutant treatment, inventorying discharge outlets, and investigating the performance of stormwater best management practices (BMPs) in terms of their ability to remove pollutants from stormwater. We are continually learning more about the performance of various stormwater practices used by WSDOT and state, tribal, and local jurisdictions.

Monitoring helps transportation agencies and regulators evaluate the effectiveness of treatment facilities and helps match the right treatment to each unique situation. WSDOT continually reviews performance monitoring data and routinely updates its policy manuals and technical guidance for use by the people who design stormwater facilities. Another example, WSDOT’s research has shown that grass-lined swales can effectively reduce most pollutants from runoff and are very economical to build and maintain. We are now working with the State Department of Ecology and other agencies on acceptable approaches to manage stormwater and flow control more broadly within a watershed.

Expanding the menu of available stormwater management techniques also helps to build connections between transportation investments and other community goals such as landscape design and watershed initiatives.

There are numerous strategies and policies that guide how stormwater is addressed on various projects. In most cases where new pavement or structures are constructed, all stormwater from the

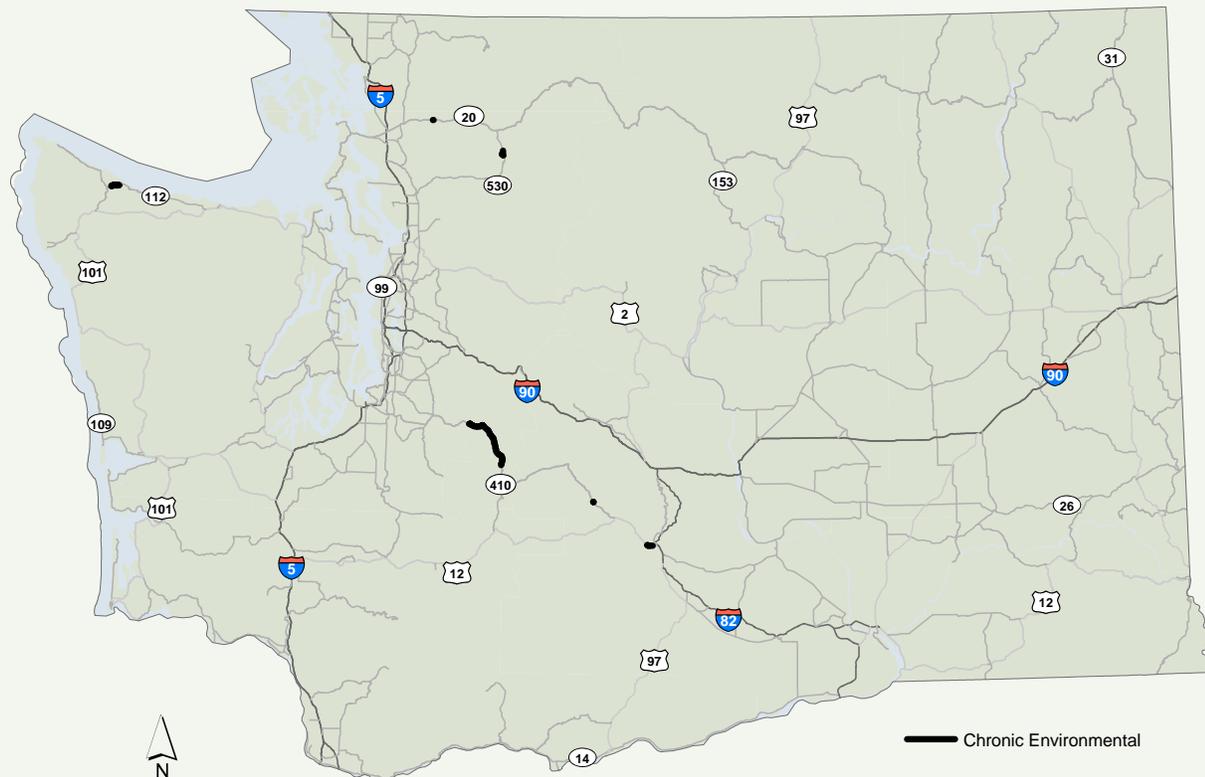
Stormwater Treatment Facility Effectiveness

Pollutant (at monitored sites)	Before Treatment (lbs)	After Treatment (lbs)	Effectiveness vs. Goal set by DOE (% removal)	Average Pounds Captured (per Year per Acre)
Solids	78.9	6.4	92/80	520
Phosphorus	0.136	0.036	74/50	0.72
Total Zinc	0.158	0.040	74/N/A	0.85
Total Copper	0.0275	0.0094	66/N/A	0.13
Dissolved Copper	0.0074	0.0049	34/N/A	0.018
Dissolved Zinc	0.054	0.027	49/N/A	0.194

Source: WSDOT Environmental Services Office

WSDOT built 42 stormwater treatment facilities in Western Washington between July 2004 and June 2005. In response to municipal stormwater permit requirements, WSDOT has built 741 stormwater treatment facilities in King, Snohomish, Pierce, and Clark counties since 1996.

Chronic Environmental Project Locations



new surfaces is treated for quality and quantity. The solutions we use are spelled out in the Highway Runoff Manual. They can range from something as simple as dispersion and infiltration to engineered facilities. Treating stormwater outside the immediate project footprint is sometimes allowed.

We have established specific provisions for treating stormwater coming from existing pavement in order to maintain the financing intent and capacity of our budget subprograms. In Mobility Projects (Program I1) treating runoff from existing pavement is always allowed. In Safety and Economic Initiatives projects (Programs I2 and I3) there is generally a limit of 20 percent of the cost to treat new pavement, although a variance can be requested. Environmental Retrofit projects (I4), except for Stormwater Retrofit, are not allowed to treat runoff from any pavement. Paving projects (P-1 subprogram) can only consider retrofitting existing impervious surfaces for projects involving the total replacement of existing concrete lanes.



This pond near Tumwater (monitoring equipment in foreground) removes most solids and phosphorus from runoff.

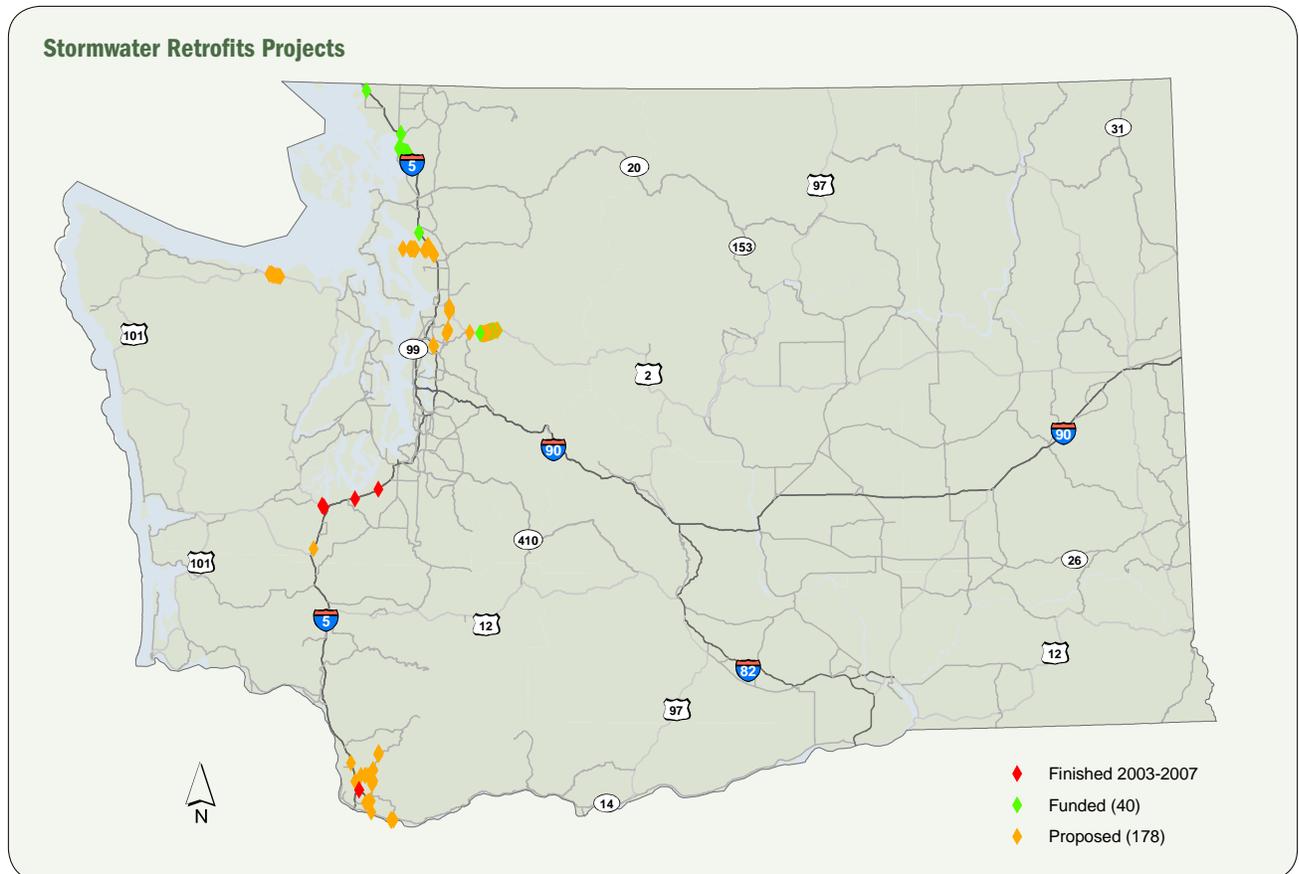


The grassy swale near Canyon Park on I-405 was most effective at removing dissolved zinc and requires little space.



A dry pond along I-5 near Everett (it only fills during storms) was the most effective at removing copper.

These policies are reviewed periodically by the Strategic Planning and Programming Office to consider any changes that may be necessary due to changes in laws and other legislative directives.



Stormwater Retrofit Vision

Needs

Most highways were built prior to stormwater regulations and have no treatment facilities associated with them. All new projects address stormwater, however, only a small amount of funds are applied to retrofit old stormwater facilities where no new construction is planned. There is also a lack of information about the outfalls on the state system. Regulations requiring that highway runoff be treated to remove pollutants and control peak flows took effect in 1995. As most of Washington's highways predate such regulations, the water running off of these highways is not treated. This lack of treatment results in large amounts of dirty stormwater leaving the highway system in thousands of places called outfalls. The water from these outfalls potentially degrade local water used for drinking, recreation, fish habitat, and other beneficial uses. Because new construction projects only affect limited portions of the highway system, WSDOT programming procedures allow for stand alone environmental improvements as part of the Environmental program. Although authorized, this program has been underfunded for some time despite a requirement of the Washington administrative Code (WAC 173-270) to retrofit deficient outfalls in the Puget Sound Region.

Strategy

While WSDOT is intent on addressing all stormwater deficiencies, this stormwater strategy priority will be given to growing urban fringe areas. There is a closing window of opportunity associated with preserving and protecting urban fringe areas compared to rural and intensely urbanized areas. As the area develops, land becomes much more expensive. Decreasing land availability and increasing real estate costs in such areas impose a level of urgency to provide stormwater treatment before currently available, cost-effective treatment options are forever lost. Development in urban fringe areas is transitioning to more intense land uses but the natural systems, while under stress, are still functioning properly and not beyond repair. Retrofitting stormwater here is more likely to make a measurable difference. At a minimum, the retrofits constructed in this environment will eliminate highways as a pollutant-contributing source as

the area builds out. There will be a large array of treatment facilities to choose from and more of an opportunity to use low impact development practices.

Because WSDOT plans to retrofit areas where the best performance can be achieved for the resources committed, the first areas selected for retrofit will be in the developing urban fringe. WSDOT will first focus on the urban fringe because it 1) still contains high quality waters, 2) land is still available for building treatment facilities and 3) the window of opportunity to protect those waters is rapidly shrinking due to development. Retrofitting outfalls in rural area is less urgent because rural waters are less likely to become significantly affected in the near future and retrofit opportunities will not diminish as quickly. Retrofitting opportunities in urban areas are already greatly restricted due to a lack of space and real estate costs. Likewise, potential benefits are low in urban areas where extensive development in surrounding areas severely limits the potential for significantly restoring habitat and water quality.

Within these developing areas environmental specialists will apply a rating methodology that takes into account proximity to sensitive surface water bodies, drinking water supplies, and traffic density. We will use the data to identify areas in the developing urban landscape where retrofits are most likely to have a beneficial impact. Additional detailed inventory can then be scheduled to determine the highest priority outfalls in those areas and the best solutions.

4. How do we characterize benefit?
 - a. We can characterize benefit in terms of 1) acres of surface treated or 2) estimate reductions in annual load. The first can be accomplished in the design and, although the second can be estimated during design, it would be prudent to monitor a variety of treatment facilities constructed for retrofit purposes.
 - b. Support other initiatives (Clean Puget Sound, Salmon recovery, etc.) Any program that relies on water. Controlling water flow benefits fish habitat, reduces bridge scour, and culvert maintenance. Managing pollutants benefits health of aquatic animals, drinking water supplies and human recreation activities.

2005 Legislative

The 2005 Legislature funded several stormwater retrofit projects (\$7.6 million for eight projects).

Description of Proposal

Increase the funding for the stormwater retrofit program to complete the outfall inventory and fund more retrofit projects.

Description of Benefits/Impacts of Implementing the Proposal

Improving the performance of highway drainage facilities will improve water quality and reduce damage to the highway system from stormwater.

A complete inventory of outfalls and treatment facilities will help WSDOT better plan, execute and maintain an effective stormwater program.

Complete the inventory of stormwater facilities on the state highway system to develop a strategic implementation plan, and begin retrofit installations at selected locations – \$340 million

This dollar request is derived from the following: Stormwater retrofit (capital) and maintenance/operating unfunded priority needs include:

- » funding projects on 5 percent of outfalls to install stormwater treatment statewide,
- » completion of an inventory of stormwater facilities (to track and prioritize);
- » stormwater facility maintenance and inspection to comply with new permits.

(Note: First 10 years = 100 million for projects and the inventory; 70 million for 20-year maintenance/operations to comply with NPDES. Actually the total amount needs to be \$340 million, not 170. The 170 was for 10 years, but the current instruction we are getting is to make the dollars needed for 20 years. For the retrofit item, the \$100 million/10-year amount was for only retrofitting 5 percent of outfalls statewide, which is a very low target to begin with.)

Benefit: Improving the performance of highway drainage facilities will improve water quality and reduce damage to the highway system from stormwater. A complete inventory of outfalls and treatment

facilities will help WSDOT better plan, execute and maintain an effective stormwater program. (Slide #16)

Related Investments proposed by Commission in WTP:

Roadside Maintenance – Retrofit of existing state highway shoulders and medians as part of the Integrated Vegetation Management program to improve filtration of stormwater runoff and establish desired grass stands.

(Note: 2 million a year for first ten years, 1 million per year last ten.)

Result would be decrease in herbicide use, weeds and invasive species and maintenance costs. Grass shoulders filter contaminants – benefiting water quality. (Slide 19)

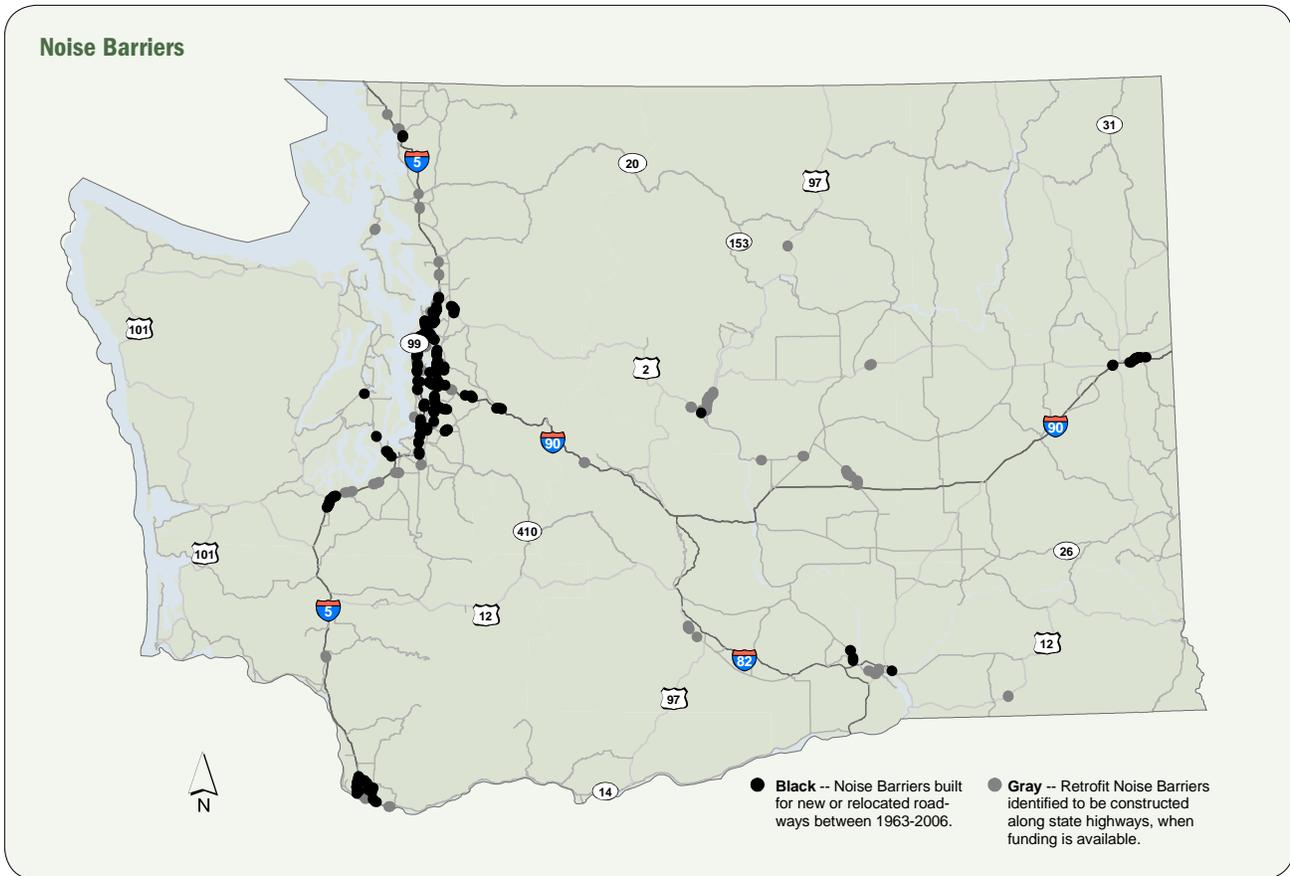
Noise Barrier Retrofit

What is the Noise Wall Retrofit Program?

Noise barrier retrofit is a voluntary program established by WSDOT to improve livability at locations where traffic noise was not considered when highways and freeways were initially built. Retrofit locations are only identified if sensitive uses like homes, schools, and parks were permitted for construction on or before May 14, 1976. The date is important because federal traffic noise regulations came into effect in 1976. Anything built prior to that date is not subject to the federal noise regulations.

A Short Summary of How, When, and Why WSDOT builds noise walls ...

Noise barriers are free-standing earth berms or walls built parallel to a highway. Walls are usually made of concrete and are found near public areas (such as parks) and residential homes. The barriers range in height from 6 to 30 feet, but are typically 12 to 15 feet tall. Around the Seattle area, examples of noise walls can be seen on Interstate 5 just north of the Ship Canal bridge, on Interstate 90 just west of the Mount Baker Ridge tunnel, and on Interstate 405 between Totem Lake and Bellevue. Most noise walls are installed as part of large construction projects that add new highway lanes, which increase vehicle capacity.



Long before construction begins, acoustical engineers evaluate sources and patterns of noise in neighborhoods near the project limits. The findings are used to determine if noise walls would be appropriate and cost-effective. This evaluation takes into account many factors, only one of which is actual highway noise. Among other things, acoustical analysts look at area topography, population density, cost, and expected levels of noise reduction a barrier would provide. If, for example, homes near a project are widely-spaced or built high on a hill, we often will not build noise barriers because the cost to reduce noise for each resident is usually quite high and the barrier does not noticeably decrease noise.

On occasion, we may build noise walls in high-noise neighborhoods that existed before the freeway. These walls, known as “retrofit” walls, are rare because their project funding must compete with other important programs like safety improvements and pedestrian accommodations. To be equitable to everyone, retrofit noise walls are ranked and built according to a neighborhood priority list. We build on

average one retrofit wall every two years. That means even if your neighborhood qualifies for a noise wall, it may be several years before it is actually built.

Our agency receives many requests from citizens to build noise barriers, but not everyone wants them. Sometimes finished barriers obscure scenic views from residents’ homes. And, in almost every case, we must remove trees and shrubs within our right-of-way to make room for a barrier.

During the design phase of a project, we hold open houses to solicit public comments. We invite you to get involved by watching for notices of these open houses in your local newspaper. We want to hear your ideas and suggestions, especially if a project is planned near your neighborhood.

Health

Noise levels at 67 decibels A-weighted for human hearing (dBA) are based on annoyance curves from previous studies and has no relationship with health. Noise and health is an extremely complex issue because it affects many people differently.

Annoyance may lead to health concerns/stress like high blood pressure, anxiety, and difficulty concentrating or sleeping in some people and not in others. Some people have a high tolerance for loud noises and others are less comfortable with quiet. Some people like to look at cars, trucks, or motorcycles, and others do not because the vehicle sounds bother them. Some people will put up with traffic if there is a scenic view at stake – but not without one. Other people are upset because they cannot control their noise environment, yet that lack of control is not an issue.

Permanent hearing loss can occur when people are exposed to continuous high sound levels according to the US Occupational Safety and Health Administration (OSHA). The OSHA regulated levels range from 90 dBA for 8 continuous hours to 115 dBA at ¼ hour or less. Typical continuous noise exposure for drivers and passengers inside standards cars may range from 65 to 85 dBA. Roadside noise from traffic on the right of way tends to ranges from 55 to 85 dBA based on a 15 minute time weighted average.

Property Values

We provide noise mitigation when it is reasonable and feasible to do so (including a cost/benefit analysis). Our determinations are not related to property values in any way. If we took property values into account, we would not be in compliance with environmental justice and non-discrimination values. The effects of noise mitigation on property values (like health), is so subjective that we can not make specific determinations. At 67 or more dBA – if we place a noise wall that blocks a scenic view – property values may go up or down depending on the values of the property owner. For some locations, property values may temporarily dip during construction phases (because people do not generally like construction delays), but then come back up again once the project is complete. In some cases, properties values may increase more without a barrier because of better access to transportation facilities. When we place barriers, the property value may go down because to some people the wall is too imposing, but others may value it more because of the noise reduction.

What is the Problem?

The impact of traffic noise on neighborhoods throughout the state was not considered before May 1976, when noise regulations were put in place. WSDOT has developed a prioritized retrofit program to construct noise barriers in these locations, but it has been under-funded.

2005 Legislative Action

The legislature provided about \$38 million to address several of the highest priority locations.

Description of Proposal

The department is looking to dedicate consistent funding for the noise retrofit program. The retrofit priority list currently consists of 61 locations in 20 different counties. This effort will address the continued backlog of noise projects which will benefit established neighborhoods and help to meet noise reduction goals in an environment of increasing traffic volumes.

The Washington Transportation Plan (WTP) identifies funding of noise retrofits as a medium priority. Based on an updated cost assuming an inflation rate of approximately four percent, the anticipated total need is estimated at \$220 Million in 2007 level dollars.

*No policy recommendations are made in the final WTP for addressing noise issues other than the specific retrofit of sixty locations.

Source WSDOT WTP Presentation-6/15/05

Noise Barrier Inventory

Source Prioritization Process

How are noise retrofit locations prioritized on the list and how will they perform?

Washington State Department of Transportation Directive D22-22 outlines the procedures for placing locations on the ranked retrofit list and provides a detailed methodology on how to prioritize locations. Locations on the list are prioritized in an order reflecting traffic noise levels, number of homes benefiting, planning level cost, and achievable reductions.

Each noise barrier project is designed to achieve noticeable reductions in traffic noise for benefiting residents. Typical reductions range from 3 to 15 dBA depending on the location of the listener in relation to the barrier. The department performs detailed noise studies prior to construction of a noise barrier to determine the amount of noise reductions that we anticipate a barrier to achieve.

Bicycle Transportation, Pedestrian Walkways and the Environment

Bicycling and walking are two modes that signify a dynamic transportation system. They not only provide environmental and health benefits, but also provide a strategy to reduce

traffic congestion and have a positive economic impact across the state. The goals of the plan are to improve bicycle and pedestrian safety while increasing the number of people who bicycle and walk. The strategies for accomplishing these goals include: maximizing funding through partnerships; raising awareness of the needs for bicycle and pedestrian safety; and sharing information on bicycle and pedestrian issues between agencies, jurisdictions, and organizations in Washington State.

The rapid increase in obesity, diabetes, and asthma among children and adults in Washington State is a growing concern. Statistics from the Centers for Disease Control show that obesity trends among adults in Washington State have increased from less than 10 percent in 1991 to over 20 percent today. Personal transportation choices, the perceived limitations on personal mobility, and in some cases the lack of transportation alternatives have been implicated as contributing factors to these disturbing trends.

Of course, many factors contribute to improving the health of a community. The WTP focuses on how transportation in general and integrated project delivery specifically can contribute to community health. The WTP does not speak to public health programs in the traditional sense, but focuses on collaborative design solutions for improving transportation connections within communities.

In response to these trends and research, several Washington communities have identified and benchmarked community health indicators that often

include transportation measures such as the number of people walking and bicycling. Pedestrian and bicycling activity is a common measure of community health because this measure reflects many different aspects including safety, security, economic vitality, public health, and the quality of the natural environment. Other indicators of healthy communities include:

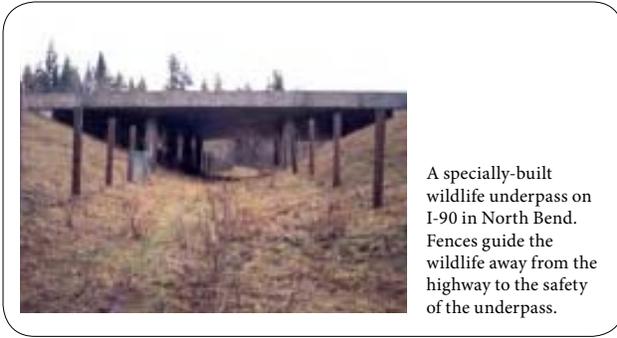
- » available and affordable housing;
- » mixture of land use;
- » strong community leadership;
- » innovative neighborhood design;
- » interconnected pedestrian and bicycle facilities;
- » economic development initiatives;
- » creative stormwater management;
- » healthy wetland areas;
- » and improved air quality.

Collaborative partnerships to develop and implement transportation systems are improving the way people live and work together by increasing access to transportation services and the way we share information about travel. A comprehensive approach to designing transportation systems considers the compatibility of each project with community character and values, the environment, and the unique needs and desires of the community.

The ability to plan, participate in planning efforts, or develop a community's transportation future depends on having trained planning staff. This is a key issue for many of Washington State's tribes, small cities, and counties that lack funding for such planning capacity.

Healthy Communities

The Department of Transportation should coordinate with the Growth Management Services Division of the Department of Community, Trade and Economic Development. The two departments should convene a task force to identify sources and ways of pooling funds in order to support local governments seeking assistance in addressing the Growth Management Act requirement to include a pedestrian and bicycle component in comprehensive plans. Pedestrian and bicycle facilities and network constructed to provide for safe and healthy transportation options through walking and biking.



Washington Provides Grant Funding for Pedestrian and Bicycle Projects

The Washington State Legislature included \$74 million over the next 16 years to support pedestrian and bicycle safety projects, such as pedestrian and bicycle paths, sidewalks, safe routes to school, and transit. The Pedestrian & Bicycle Safety program will address the nearly 400 statewide fatalities and injury collisions involving pedestrians and bicyclists each year.

The purpose of the Pedestrian and Bicycle Safety program is to aid public agencies in funding cost effective projects that improve pedestrian and bicycle safety through engineering, education, and enforcement. Eligible projects may address the following:

- A. **Engineering Improvements** – Projects may include items such as:
 - » Improving intersections by providing: curb extensions, lighting, raised median, crosswalk;
 - » Enhancements, signs, signals, and mid-block crossing treatments;
 - » Completing bicycle lanes and sidewalks;
 - » Constructing bicycle and pedestrian paths;
 - » Providing safe routes to transit;
 - » Providing pedestrian and bicycle safety improvements for at-risk groups (children, the elderly, and people with disabilities).

- B. **Education Efforts** – Projects may include items such as:

- » Implementation of educational curricula;
- » Distribution of educational materials;
- » Development of promotional programs for walking and biking.

- C. **Enforcement Efforts** – Projects may include items such as:

- » Additional law enforcement or necessary equipment for enforcement activities;
- » Vehicle speed feedback signs;
- » Neighborhood watch programs;
- » Photo enforcement.

Habitat Connectivity

Why is this an issue for WSDOT?

There is a growing understanding of the impacts of roads on wildlife and habitat. This is important from a natural resource conservation perspective as well as a matter of public safety. The 2005 publication by the National Academies of Sciences “Assessing and Managing the Ecological Impacts of Paved Roads” identifies how roads can constitute barriers to animal movement, lead to habitat loss, and in some cases can contribute to the decline of imperiled wildlife populations. Animal-vehicle collisions pose a serious hazard for motorists as well as a significant source of wildlife mortality. WSDOT annually records about 3,000 collisions with deer and elk on state highways.

Washington is biologically diverse state with over 650 vertebrate species. More than 63 of these are currently designated under the federal Endangered Species Act, including 38 terrestrial species. A list of these species can be found at: The state highway system occurs in the majority of the habitat types of the state. There is strong public support for transportation solutions that include ecological considerations as part of meeting transportation objectives.

Measures such as enlarged stream crossing structures, wildlife crossing structures, animal detection and warning systems, and fencing have proven useful in reducing some of the problems, but these need to be applied in a strategic manner to get the best gain. Significant effort has been made in a few areas of the State, such as the I-90 Hyak to Easton corridor, but in Washington, the attention has largely been opportunistic, and project by project. To provide the best benefit for habitat connectivity as well as helping reduce the potential for animal-vehicle collisions, a system for identifying and prioritizing key areas statewide is needed. This can then be used to develop location specific solutions in a strategic manner.

How can we contribute to a solution?

While there is a growing body of knowledge about how to better address wildlife habitat connectivity Research is needed to help identify high priority focus areas in the state for addressing wildlife connectivity statewide and to make preliminary recommendations for addressing connectivity. Working with existing GIS data, and other existing information including local expert knowledge, it would be possible to develop a habitat connectivity plan for the highway system. This would include where notable habitat linkage areas exist for large terrestrial animals such as deer, elk and cougar, as well as for other species that are of special conservation management concern. This prioritization should also note localities that have management for protecting nearby habitat and where significant records for animal vehicle collisions occur.

Potential Benefits of addressing this issue

This effort would provide a basis for determining the locations of key focus areas for connectivity. This could be used in project planning and scoping to identify where the best opportunities for improving connectivity and reducing animal vehicle collisions are and allow these to more be easily included in project planning. With a well developed system for prioritization, WSDOT will gain a better understanding of the scope and scale of the issue and will develop proactive strategies for improvements. This would also help with demonstrating compliance with SAFTEA LU section 6001 that directs states to incorporate natural resource information into transportation planning.

Habitat Connections

What is the Problem?

Transportation systems have the potential to impact habitat in ways that include:

- » Direct effects such as noise disturbance or wetland fill
- » Habitat fragmentation
- » Barrier effects that impede the movement of fish and wildlife.
- » Vehicle-wildlife collisions.

WSDOT recognizes the importance of habitat connections at the policy level. Funding for program support is needed to more consistently consider habitat connection as part of transportation planning, design, and construction.

Strategy to Address the Need

WSDOT will develop a habitat connectivity plan, which will identify areas where habitat connectivity must be maintained. These will include priority areas where highways intersect important wildlife linkage zones, wildlife migration routes, and lands under special management for the protection and enhancement of wildlife (like wildlife refuges). These areas will be prioritized as low, medium and high priority for retrofit. Prioritization will consider many factors including, but not limited to, permeability needs of ESA listed species, areas of high animal vehicle collisions, management of adjoining landscaped (i.e., wildlife refuges, national forest etc.), and highway areas that are wider than normal.

Performance Outcomes

Effectiveness of the program will be measured by the methods that relate to the solutions implemented. Typical measures may include reductions in the numbers of animal vehicle collisions, a measure of the number of connectivity structures installed per mile, frequency of use of connectivity structures, miles of habitat corridors connected etc.

2005 Legislative Action

None

Description of Proposal

Funding identification and prioritization of problem areas, development of design guidance, and coordination with agencies for connectivity planning.

Description of Benefits/Impacts of Implementing the Proposal

Careful analysis will help WSDOT determine the highest priority locations where investments should be made. This proposal would create dual benefits: protect wildlife and improve the safety of the traveling public.

Increase habitat connectivity by providing safe connections across the highway for wildlife migration – \$50 m

Benefits = Improve streams for fish habitat, increase potential for salmon recovery, and improve wildlife habitat and connectivity.

(Note: Establish program in 07/09 to set priorities; plan for gradual start to program through 2027.)

Habitat Connectivity - the ability to reduce animal/vehicle collisions by providing safe connections across the highway for animal migration: Careful analysis will help WSDOT determine the highest priority locations where investments should be made. This proposal would create dual benefits: protect wildlife and improve the safety of the traveling public.



Long bridge spans, like this one on SR 504 near Kidd Valley, stretch across streams and adjacent uplands. They are readily used as road underpasses by wildlife.



Computer-generated image of an overpass structure currently being considered for the I-90 project between Hyak and Easton. See gray box.

Wildlife Crossings on Snoqualmie Pass

WSDOT is planning to build 14 wildlife crossings on I-90 using funds from the 2005 Transportation Funding Package. These structures will be used to control wildlife crossings on a 15-mile stretch of road from Hyak to Easton. Overpasses and underpasses will be placed in areas that are heavily used wildlife crossing spots, connecting wildlife habitats on either side of the highway and in a large median area between the eastbound and westbound lanes. Ideas being considered for monitoring techniques include “track pits” (freshly-turned earth that is checked periodically for animal tracks) and hidden videocameras. WSDOT is currently examining structures in Arizona, Montana, and Canada to discover best practices in developing the structures and monitoring their usage. Construction could begin in 2011. For more information, visit www.wsdot.wa.gov/Projects/I90/Hyakto-KeechelusDam/