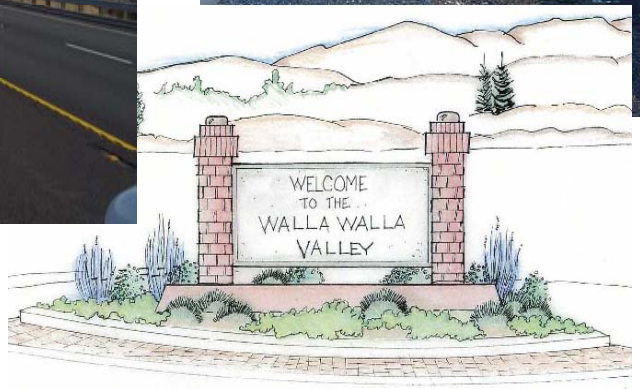
WSDOT Project Environmental Mitigation Costs

Case Studies

Third Edition



March 2009

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Washington State Department of Transportation

MAKING EVERY DOLLAR COUNT.

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Executive Summary

The Washington State Department of Transportation (WSDOT) is committed to maintaining our existing infrastructure and improving the operations and safety of our transportation system. One of the integral parts of our project development and construction program is WSDOT's environmental policy and implementation efforts. As a part of being good stewards of the environment, WSDOT conducts all of its activities in accordance with the most current environmental protection practices. The Department also meets or exceeds its commitments by either avoiding, minimizing or appropriately mitigating adverse environmental impacts. Fulfilling these commitments requires considerable effort during all phases of a project including planning, development, construction, maintenance, and operation of our transportation systems and facilities. Strategic measures are taken in order to integrate the built and natural environments, protecting our state's environmental assets and resources. These measures are the "mitigation" we do to facilitate successful projects and meet our agency's environmental objectives and commitments.

The environmental documentation on our projects, such as an EIS, communicates to the public and other agencies exactly how impacts will be *avoided, minimized,* and/or *mitigated.* Specific mitigation features and related costs are project specific and vary considerably based on the proposed work and location. Plans for mitigation generally take shape as WSDOT works with other agencies at federal, tribal, state, and local levels to develop specific conditions to reconcile a project with requirements that grow from concerns about adverse impacts on the environment and other public values. Often these conditions are expressly written into the project's legally required permits; for example, under the Clean Water Act or the Shoreline Management Act.

Permit conditions might include wetland restoration, stormwater runoff treatment and control facilities, conservation of historic properties and noise walls. Each case study year has included some projects with features for the specific purpose of actually avoiding an impact, such as the placement of a retaining wall adjacent to a stream or wetland.

Executive Summary

Two previous studies were conducted, one in 2003 that evaluated 14 projects and a second one in 2006 that evaluated seven. This study evaluates another 14 projects and follows that same methodology in its development, including the cost items listed on page 9 of this report. Context Sensitive Solutions are incorporated into the other associated mitigation categories as applicable. This study attempts to highlight only those Context Sensitive Solutions that were a significant part of the projects mitigation costs. In addition, temporary (construction) mitigation efforts are included with the particular mitigation category as applicable. As with the previous studies, this one is intended to quantify the mitigation efforts associated with our highway projects and try to identify any significant findings.

Environmental mitigation costs on WSDOT highway projects are considered by some to be too costly while others believe that it's the right thing to do regardless of cost. This presents the challenge of striking a balance between costs and providing the appropriate amount and type of mitigation. These case studies illustrate mitigation features provided for specific projects, their costs, and the drivers behind their incorporation into the projects.

The following bullet points illustrate some of the key findings from this study:

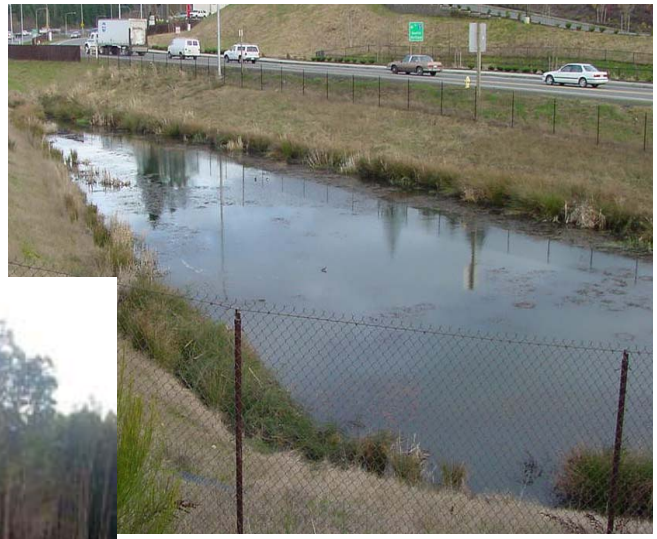
- The percent of a project's cost spent on mitigation varies greatly with the project type and location.
- Projects west of the Cascade Mountains typically have higher levels of mitigation and related costs.
- More stringent requirements for managing stormwater is one of the primary drivers that has resulted in a steady increase in stormwater mitigation costs.
- 40% of the stormwater mitigation costs for this study are related to temporary mitigation efforts.
- Right-of-way costs associated with mitigation for this study are a relatively minor portion of the total costs for mitigation.

Methodology
TEMPORARY MITIGATION

Construction activities can create situations with potential environmental impacts such as exposed soils during excavation. In order to provide protection during construction WSDOT implements many types of preventive measures or temporary mitigation. Examples include temporary ponds for water quality treatment and installing products to stabilize loose soil for erosion control. Other measures are less obvious such as restricting the hours of work to reduce noise impacts. All together these types of measures are implemented in order to construct our projects while preventing impacts to the environment. The following lists some typical items associated with temporary mitigation cost calculations.

Calculation of temporary mitigation costs typically includes, but is not limited to, the following items:

- Temporary excavation and embankment
- Silt Fence/Wattles/Dikes/Straw/Compost Berms
- Water quality monitoring
- Seeding/rockery/filters
- Pipes and inlets
- Vaults, ponds and bioswales
- Stream by-pass system
- Air quality (dust prevention)
- Erosion control and planting
- High visibility fencing
- Additional fencing
- Tire/Wheel wash



Methodology
STORMWATER MITIGATION

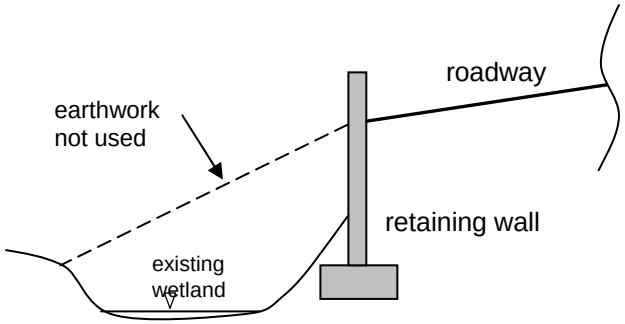
Stormwater runoff can be problematic for streams, water bodies and wetlands. To address these issues WSDOT implements Best Management Practices in order to prevent or reduce potential runoff damage. With recent changes in stormwater management requirements, projects are now incorporating more infiltration and dispersion measures. A few examples include natural and engineered dispersion, compost amended vegetated filter strips (CAVFS), and media filter drains (formerly knows as ecology embankments). Existing highway sections that have no stormwater treatment, or where existing stormwater treatment is substandard are often times improved in conjunction with new highway improvements. Highway stormwater management systems include: providing runoff treatment to meet water quality standards; recharging groundwater; preventing flow erosion; and controlling the rate and duration of storm flows from state right of way. The following lists some typical items associated with stormwater management cost calculations.

Calculation of stormwater mitigation costs typically includes, but is not limited to, the following items:

- Excavation and embankment
- All bid items associated with stormwater once it leaves the roadway (beyond the edge of pavement)
- All bid items associated with conveyance of stormwater to the treatment facility (beyond edge of pavement)
- Pipes, inlets, catch basins, and manholes
- Flow spreaders and flow control structures
- Maintenance access roads to facility
- Compost and topsoil
- Seeding and erosion control planting
- Quarry spalls for energy dissipation and outfall protection
- Additional fencing
- Right of way purchase costs associated with stormwater management

Methodology
WETLAND MITIGATION

When transportation projects create unavoidable wetland impacts, wetlands are enhanced, restored, created, or preserved. Wetland mitigation costs vary based on the type of impact, cost of real estate, and the required replacement ratio. Other contributing factors are special conditions or more stringent mitigation ratios required by the local jurisdiction in which the project resides.



Retaining Wall Used to Avoid Wetland

Retaining walls can be used to avoid a wetland or to minimize impacts. The avoidance cost is reported as in-place cost of wall minus the cost of earthwork that would have been used had the wetland not been there.

Wetland Avoidance, Minimization & Compensatory Mitigation Costs typically include, but are not limited to:

Any alterations to the roadway design needed to avoid or minimize wetland impacts:

- Retaining walls
- Altered roadway alignment
- Steeper side slopes
- Guard rail
- Bridges
- Culvert installation

Any items required to compensate for unavoidable impacts:

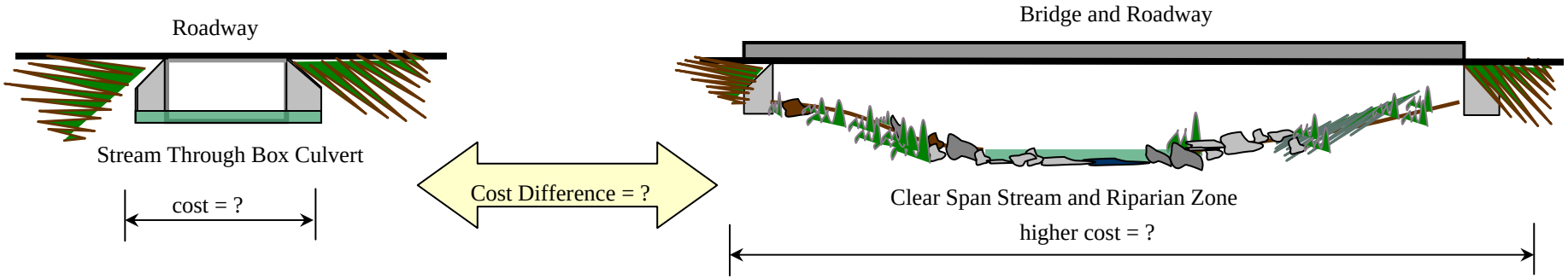
- Property acquisition
- Costs constructing wetlands: excavation, grading, soil amendments, plant installation, wildlife habitat structures, etc.
- Site monitoring & management

Any items required as a condition of a wetland permit:

- Removing invasive plants
- Silt fencing or high visibility fencing

Methodology
STREAM MITIGATION

Protection of rivers and streams is critical and can influence the design and construction elements of roadways and bridges. There are multiple types of stream protection actions including enhancements to the riparian, or a bridge span over a stream that is wider than the actual width of the stream. For example, if a stream is 10 feet wide and a box culvert of that dimension would sufficiently meet state and federal design standards for carrying stream flow beneath the roadway, but permit conditions require a clear span bridge 50 feet long to protect the other stream habitat functions (such as floodplain connectivity, riparian buffers, bedload and woody debris transport, or channel migration) then a mitigation cost difference can be realized and reported.



These drawings illustrate various types of designs of structures over streams. Box culverts are typically less expensive than bridges that span a stream. However, there are situations where the additional cost for a clear span is necessary and warranted to provide for fish passage.

Often times impacts to a stream/sensitive area parallel to the roadway are avoided or minimized by installing a retaining wall instead of constructing the fill slope that would be necessary for supporting the road.

Methodology
NOISE MITIGATION

Federal law and state policy require that every project that builds a new road, adds through-lanes, or significantly realigns a roadway must receive a noise evaluation. Where outdoor noise is expected to reach a lower limit of 66 decibels at “noise sensitive” locations like homes, schools, churches, day care centers, and hospitals are expected, noise mitigation (e.g., walls, earth berms) is evaluated to determine whether it will be meaningful and cost-effective. Noise barriers can reduce traffic noise at residences by as much as one-half and the cost of noise barriers can vary based on the availability of right of way and the materials used.

Since 1963, WSDOT has built over 83 miles of noise barriers throughout the state and we expect that more barriers will be needed in the future as we continue to build projects in our state’s growing urban areas.

Noise abatement costs include, but are not be limited to:

- Cost of barriers in place
- Excavation and embankment
- Right of way costs associated with noise barrier
- Concrete foundations and walls
- Clearing and grubbing
- Wall fascia treatments

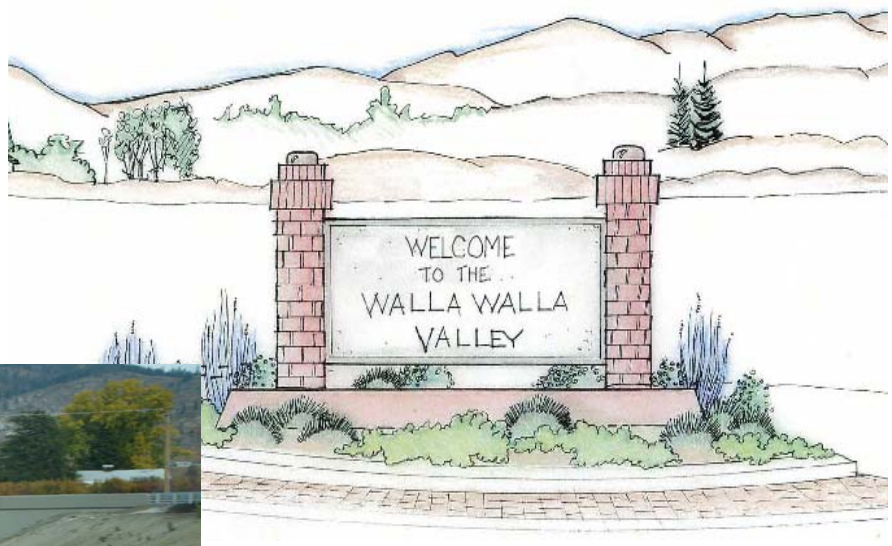
Methodology
CONTEXT SENSITIVE SOLUTIONS

National Environmental Policy Act, Intermodal Surface Transportation Efficiency Act and the National Highway System Designation Act of 1995 provides the legislative background for Context Sensitive Solutions. The intent is to provide flexibility in design, stress the importance of preserving historic and scenic resources, provide transportation enhancement projects that reduce the intrusion of the landscape, be compatible with the existing built and natural environment and add lasting value to the community.

Achieving Context Sensitive designs involves a collaborative, interdisciplinary approach requiring stakeholder and public involvement.

Context Sensitive Solution costs include, but are not limited to:

- Providing community gateways
- Providing community connectivity
- Concrete stamping and coloring
- Unique guardrail or railing
- Special landscaping
- Shared-use paths

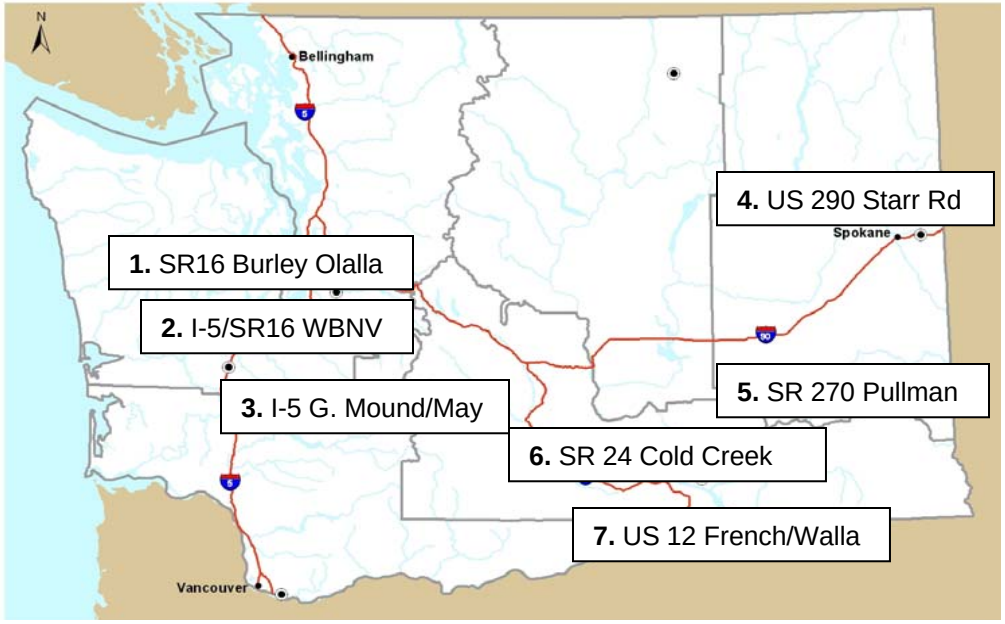


Cost Development

The mitigation feature costs represented in this report are based on bid amounts or actual final mitigation construction costs and include the following: [1]

- Construction cost (actual cost from bid document or contractor payments)
- Allocated share for state sales tax; generally found to be approximately 8% added to overall construction contract amount.
- Right of way (actual acquisition cost).
- Allocated share of contractor's mobilization; ranging from 4.5% to 14.7% of the overall construction amount.
- Allocated share of WSDOT cost for construction engineering and administration adds an amount equal to 8% -22% of construction contract amount.
- Allocated share of WSDOT Planning and Design typically adds an amount equal to 6% - 20% of the overall project costs.
- Temporary mitigation costs are included in the particular mitigation category as applicable.
- Some of the costs for Context Sensitive Solutions (CSS) are included in the particular mitigation category as applicable. Only those costs associated with CSS that are a significant portion of the mitigation for a particular project are shown separately.

[1] The costs of processing environmental assessments and permit applications are reflected in the studies, as the data collected includes the expense of preparing environmental documentation. Costs associated with project design selections specifically based on avoiding or minimizing environmental impacts are not included.



Project Case Studies

1. SR 16 Burley Olalla Interchange
Constructs new grade separated interchange
Project cost: **$24.1M**
Mitigation Types: stormwater, wetland and stream

2. I-5/SR 16 Westbound Nalley Valley Interchange
Improves the westbound connection between I-5 and SR 16 as part of Tacoma HOV program
Project cost: **$205M**
Mitigation Types: stormwater

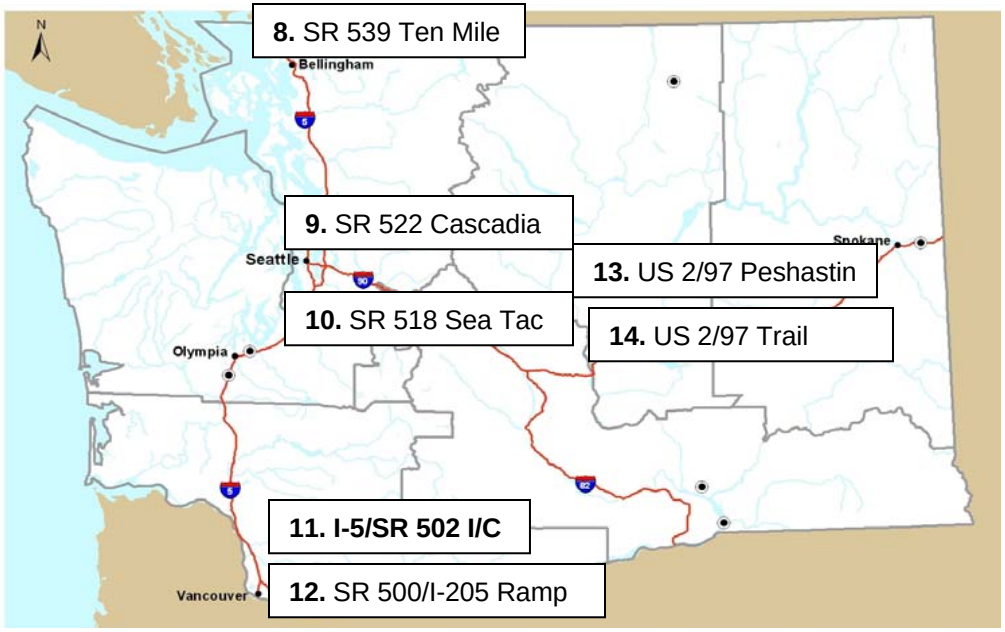
3. I-5 Grand Mound to Maytown Widening
Widens I-5 to create three general purpose lanes
Project cost: **$69.8M**
Mitigation Types: stormwater, wetland and stream

4. US 290 Starr Rd. Intersection Turn Lanes
Provides right turn channelization to improve safety
Project cost: **$0.25M**
Mitigation Types: stormwater

5. SR 270 Pullman to Idaho State Line
Widens from two lanes to four lanes
Project cost: **$30.4M**
Mitigation Types: stream, stormwater, wetland and context sensitive solutions(CSS)

6. SR 24 – SR241 to Cold Creek Passing Lanes
Added passing lanes both directions
Project cost: **$3.3M**
Mitigation Types: stormwater

7. US 12 Frenchtown to Walla Walla
Added lanes to create a divided four-lane highway
Project cost: **$56.6M**
Mitigation Types: stormwater, wetland and CSS



Project Case Studies

8. SR 539 Tenmile Rd. to SR 546 Widening - Stage 1
Converts a two-lane highway into a divided four-lane facility
Project cost: **$93.9M**
Mitigation Types: stormwater, wetland and stream

9. SR 522 UW/Cascadia Community College Campus Access
Improves access to Cascadia and relieves congestion
Project cost: **$49M**
Mitigation Types: wetland, stream and stormwater

10. SR 518 SeaTac Airport to I-5/I-405 I/C
Adds a third eastbound lane
Project cost: **$28.9M**
Mitigation Types: stormwater, wetland, stream, noise and CSS

11. I-5/SR 502 Interchange
Grade separation to improve safety and mobility
Project cost: **$51.7M**
Mitigation Types: stormwater, wetland and stream

12. SR 500/I-205 Interchange Improvements
Lengthened a merge lane beyond interchange area
Project cost: **$0.63M**
Mitigation Types: stormwater and wetland

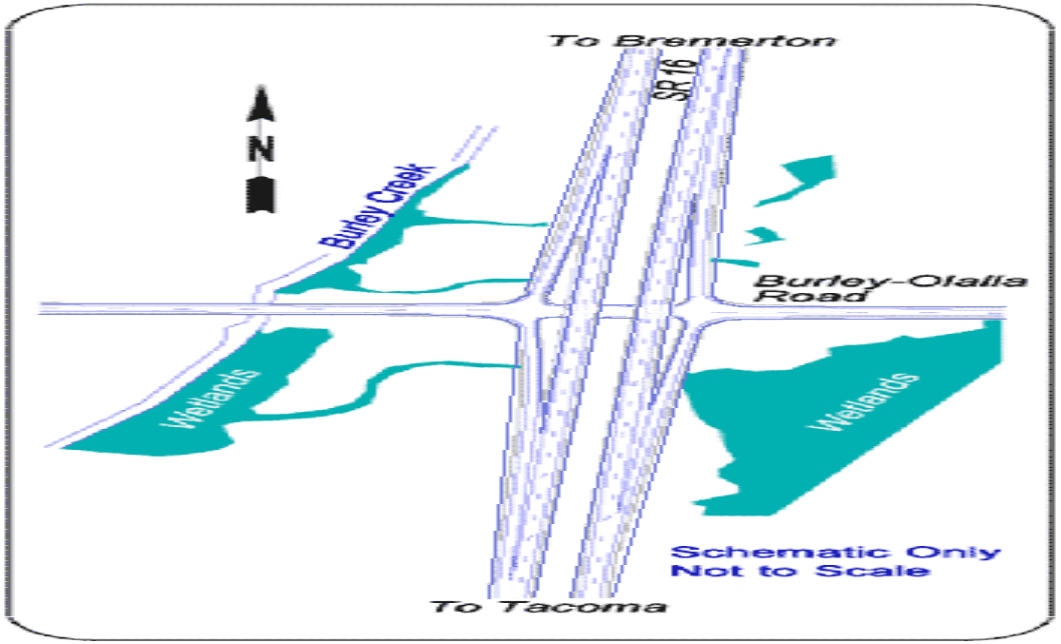
13. US2/97 Peshastin East Interchange
Grade separation to improve safety
Project cost: **$21.1M**
Mitigation Types: stormwater and CSS

14. US 2/97 Wenatchee Trail Connection
Provides a direct bike/ped connection
Project cost: **$1.7M**
Mitigation Types: stormwater and CSS

SR 16 Burley Olalla Interchange

The intersection of Burley Olalla and SR 16 is the last remaining at-grade intersection on SR 16 between Tacoma and Gorst with cross median traffic. This intersection has experienced a significant number of accidents and has been classified as a high accident location. To improve safety at this location a grade separated tight-diamond interchange is being constructed, providing complete access between SR 16 and Burley Olalla Road. Construction activities began in July 2008 and is scheduled for completion in Fall 2010.

Mitigation Types: stormwater, wetland, stream



The decision for a tight diamond, and to elevate mainline in lieu of the cross-road, avoided impacts to Burley Creek just west of SR 16. One of the unique elements of mitigation on this project was for the wetlands. During the development of the project one of the challenges the design team faced was finding a suitable site for wetland mitigation. An exhaustive search was performed with no immediate results. During our search, we found a private mitigation company that had available land within two miles of the project but not within the projects watershed. In working with the resource agencies, the team was able to gain conceptual approval to move forward with taking this apporach. Through extensive coordination within WSDOT with the Attorney General's Office and the private company, an agreement was reached to utilize the off-site location for wetland mitigation at a cost of $1.08 million. The actual wetland impact from the project is just shy of 2 acres and the mitigation site is 8 acres.

SR 16 Burley Olalla Interchange

Significant Mitigation Drivers	Agency	Mitigation Categories	Mitigation Cost	% of Project Cost	Mitigation Comments
Clean Water Act Section 402	Ecology	Stormwater Facilities	$2,643,000	11.0%	2 stormwater ponds, bioswales, media filter drains and natural dispersion treating over 32 acres of impervious surface.
Clean Water Act Section 404 Clean Water Act Section 401	Corps Ecology	Wetlands Restoration	$1,080,000	4.5%	8 acres of off-site mitigation bank was used to address the impacts to existing wetlands.
Clean Water Act Section 401 Clean Water Act Section 404 Hydraulic Project Approval	Ecology Corps WDFW	Stream Protection	$868,000	3.6%	Burley Creek runs through the project. Two box culverts installed to allow fish passage.
		Totals	$4,591,000	19.1%	

Stormwater – $2.64M

Wetland – $1.08M

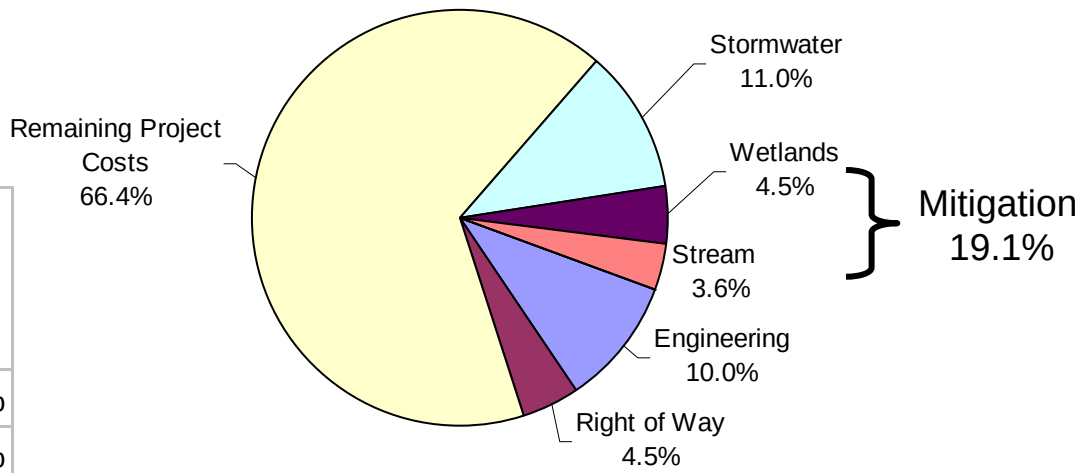
Stream – $0.87M

SR 16 Burley Olalla Interchange

Phase Costs	
Preliminary Engineering	$2.41M
Right of Way	$1.08M
Construction	$20.64M
Total	$24.13M

Mitigation Elements	Total Mitigation Cost	% of Total Project Cost
Stormwater	$2.64M	11.0%
Wetland	$1.08M	4.5%
Stream	$0.87M	3.6%
Total of Mitigation Elements	$4.59M	**19.1%**
All Other Items	$19.54M	
Total	$24.13M	

Cost Breakdown



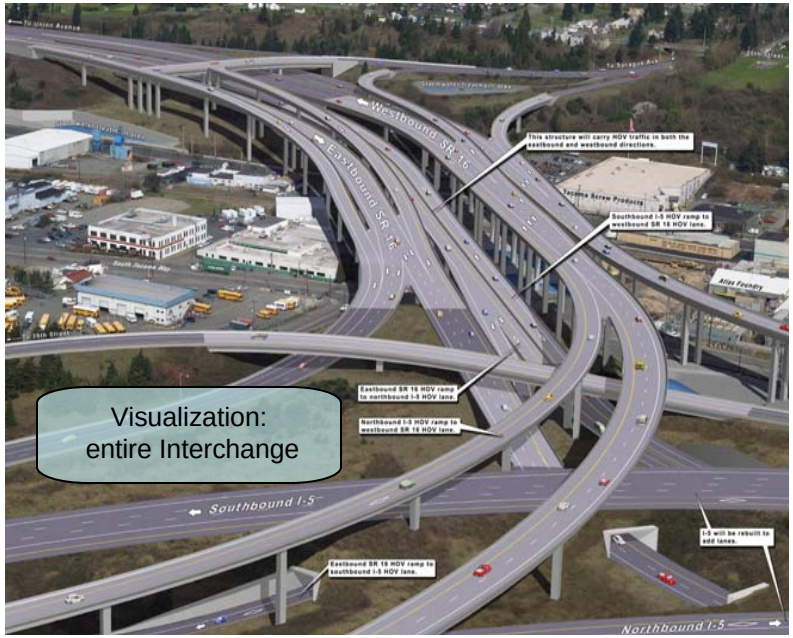
<u>Lane Mile Cost Equivalence:</u>

Adds 4 new ramps at $23.2M per lane mile.

Total project cost is $24.1M for 1.04 new lane miles.

Minus the cost of mitigation - $18.8M per lane mile

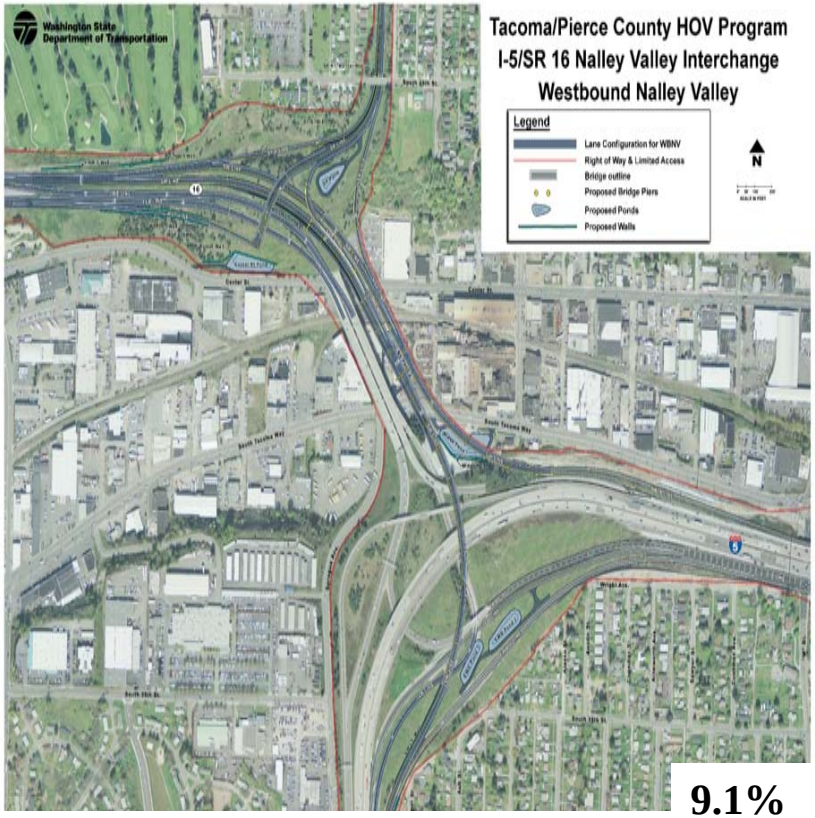
I-5 / SR 16 Westbound Nalley Valley Interchange



Westbound Nalley Valley (WBNV) is one of a series of projects to reduce congestion, improve safety and add High Occupancy Vehicle (HOV) lanes in Pierce County. The Tacoma/Pierce County HOV Program will construct a total of 22 projects upon its completion. Westbound Nalley Valley Interchange specifically improves the westbound connection between I-5 and SR 16 through a collection of new bridges and ramps.

Mitigation Type: stormwater

I-5 / SR 16 Westbound Nalley Valley Interchange					
Significant Mitigation Drivers	**Agency**	**Mitigation Categories**	**Mitigation Cost**	**% of Project Cost**	**Mitigation Comments**
Clean Water Act Section 402	Ecology	Stormwater Facilities	$18,751,000	9.1%	5 ponds occupying 3.2 acres, treating nearly 44 acres of new impervious.
		Totals	$18,751,000	9.1%	



9.1%

Stormwater – $18.75M

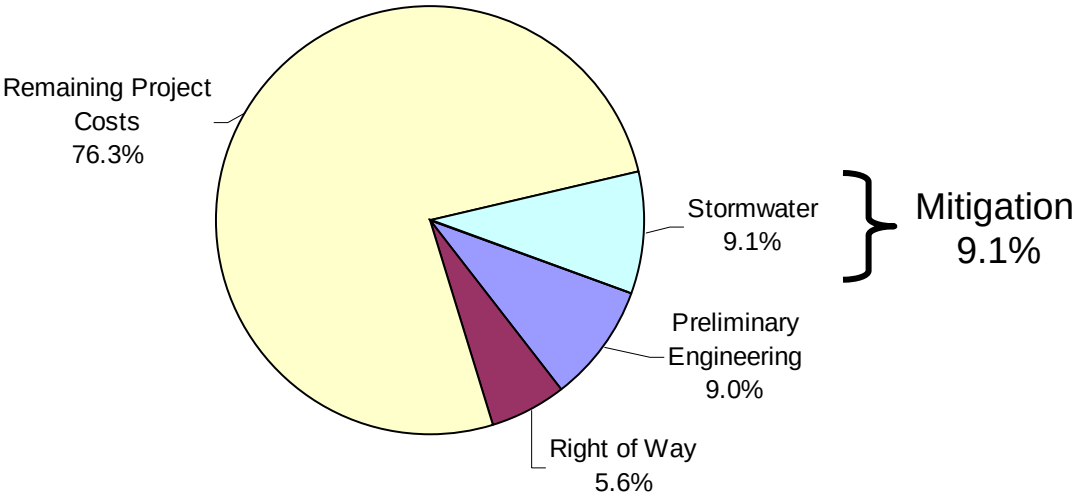
With limited opportunities for mitigation on-site and for program delivery efficiencies, only stormwater facilities are being constructed under this project. Wetland and noise mitigation is being pursued and incorporated into other projects. Nearly all of the stormwater mitigation facilities required for the ultimate Nalley Valley interchange are being constructed under this project (five of the six ponds required). The Eastbound Nalley Valley project will construct the final pond. Creative integration of the ponds within the interchange area eliminated the need for right-of-way purchase specifically for stormwater mitigation. For the purpose of this study we have only included the costs associated with this contract as one example of the strategic methods deployed by WSDOT in efficient and effective project delivery.

I-5 / SR 16 Westbound Nalley Valley Interchange

Phase Costs	
Preliminary Engineering	$18.53M
Right of Way	$11.47M
Construction	$174.96M
Total	$204.96M

Mitigation Costs		
Mitigation Elements	**Total Mitigation Cost**	**% of Total Project Cost**
Stormwater	$18.75M	9.1%
Total of Mitigation Elements	$18.75M	**9.1%**
All Other Items	$186.21M	
Total	$204.96	

Cost Breakdown



<u>Lane Mile Cost Equivalence:</u>

Adds 1.5 lane miles and 0.9 auxiliary lane miles at $85.4M per lane mile.

Total project cost is $204.96M for 2.4 new lane miles.

Minus the cost of mitigation - $77.6M per lane mile.

I-5 Grand Mound to Maytown Widening

This project is one of four that will provide a minimum of three lanes in each direction of I-5 between Centralia and Marysville. In addition, existing on/off ramps will be upgraded to meet current design standards, providing important safety improvements. With nearly 80,000 vehicles per day using this section of roadway coupled with future growth an additional lane is paramount in keeping traffic moving. Construction activities began in April 2008 and is scheduled for completion in Summer 2010.

Mitigation Types: stormwater, wetland, stream

I-5 Grand Mound to Maytown Widening

Significant Mitigation Drivers	Agency	Mitigation Categories	Mitigation Cost	% of Project Cost	Mitigation Comments
Clean Water Act Section 402	Ecology	Stormwater Facilities	$16,765,000	18.2%	17 ponds and ecology embankment treating nearly 129 acres of impervious surface,
Clean Water Act Section 404 Clean Water Act Section 401	Corps Ecology	Wetlands Restoration	$855,000	0.9%	Included contribution to Upper Chehalis River Basin wetland bank.
Clean Water Act Section 401 Clean Water Act Section 404 Hydraulic Project Approval	Ecology Corps WDFW	Stream Protection	$726,000	0.8%	Three structural earth walls to minimize impacts.
		Totals	$18,346,000	19.9%	

Over 90% of the mitigation for this project is attributed to stormwater. The only right-of-way acquired for the project was for one of the ponds at a cost of $980,000. A temporary geo-synthetic wall was used to protect a wetland for a traffic revision during construction.

Stormwater – $16.76M

Wetland – $0.86M

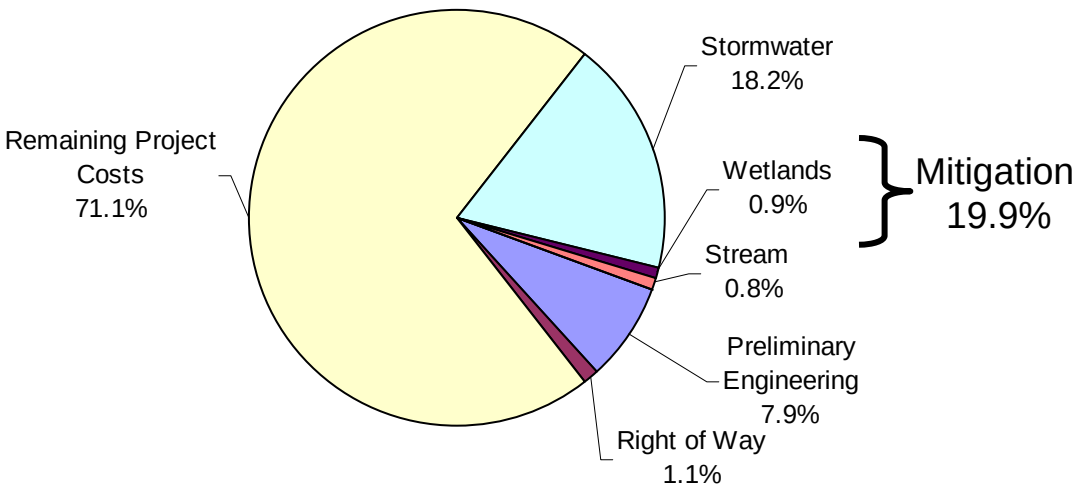
Stream – $0.73M

I-5 Grand Mound to Maytown Widening

Phase Costs	
Preliminary Engineering	$7.28M
Right of Way	$0.98M
Construction	$83.87M
Total	$92.13M

Mitigation Elements	Total Mitigation Cost	% of Total Project Cost
Stormwater	$16.76M	18.2%
Wetland	$0.86M	0.9%
Stream	$0.73M	0.8%
Total of Mitigation Elements	$18.35M	**19.9%**
All Other Items	$73.78M	
Total	$92.13M	

Cost Breakdown



<u>Lane Mile Cost Equivalence:</u>

Adds two lanes at $5.62M per lane mile.

Total project cost is $92.13M for 16.4 new lane miles.

Minus the cost of mitigation - $4.50M per lane mile.

US 290 Starr Rd. Intersection Turn Lanes

The intersection of US 290 and Starr Road has seen a significant number of collisions including ones of high severity. To improve safety and operations at this location right turn channelization has been installed along with curbing to control access and enhance pedestrian mobility. Construction activities were completed in June 2008.

Mitigation Types: stormwater

US 290 Starr Rd. Intersection Turn Lanes					
Significant Mitigation Drivers	**Agency**	**Mitigation Categories**	**Mitigation Cost**	**% of Project Cost**	**Mitigation Comments**
Clean Water Act Section 402	Ecology	Stormwater Facilities	$11,400	4.6%	The new turn lanes resulted in the need for a small treatment pond.
		Totals	$11,400	4.6%	

4.6%

Stormwater – $0.01M

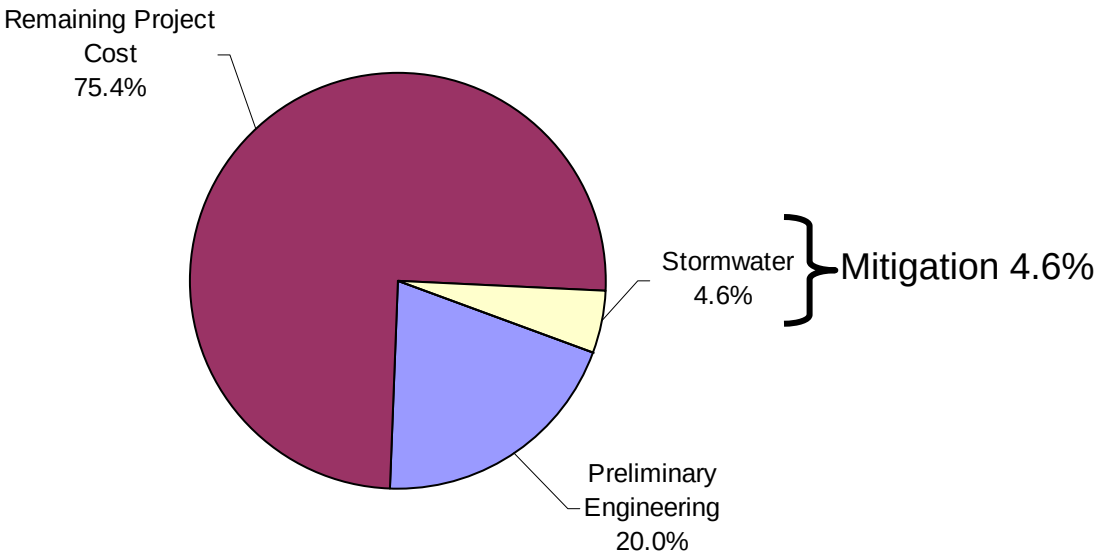
The minor amount of contributing impervious area and the availability of space adjacent to the new lane allowed for a simple low cost solution to stormwater mitigation.

US 290 Starr Rd. Intersection Turn Lanes

Phase Costs	
Preliminary Engineering	$0.05M
Construction	$0.20M
Total	$0.25M

Mitigation Costs		
Mitigation Elements	**Total Mitigation Cost**	**% of Total Project Cost**
Stormwater	$0.01M	4.6%
Total of Mitigation Elements	$0.01M	**4.6%**
All Other Items	$0.24M	
Total	$0.25M	

Cost Breakdown



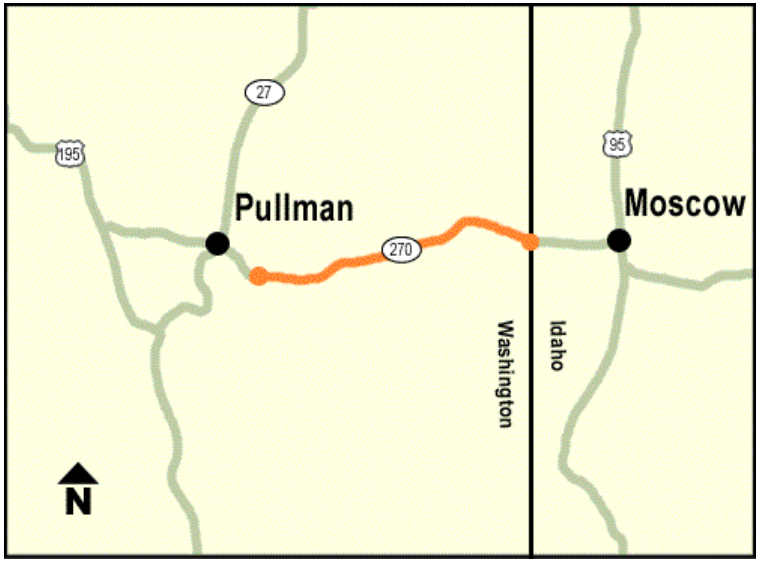
<u>Lane Mile Cost Equivalence:</u>

Added a turn lane at $3.11M per lane mile.

Total project cost is $0.25M for 0.08 new lane miles.

Minus the cost for mitigation - $3.00M per lane mile

SR 270 Pullman to Idaho State Line



SR 270 is a significant regional truck route and the primary connection between two major universities. With the need for improved safety and capacity this section of SR 270 was widened from a two-lane highway to a four-lane facility with a median that provides refuge for turning traffic and separation between opposing traffic. Construction activities began in July 2006 and were completed in November 2007.

Mitigation Types: stormwater, wetland, stream

SR 270 Pullman to Idaho State Line

Significant Mitigation Drivers	Agency	Mitigation Categories	Mitigation Cost	% of Project Cost	Mitigation Comments
Clean Water Act Section 402	Ecology	Stormwater Facilities	$1,301,000	4.3%	8 ponds and 19 separate bio-swales occupying 4.6 acres treated just under 15 acres of impervious surface.
Clean Water Act Section 404 Clean Water Act Section 401	Corps Ecology	Wetlands Restoration	$1,805,000	5.9%	6 acres impacted by the project which required 15 acres of mitigation based on a 1:1 replacement ratio plus buffers.
Clean Water Act Section 401 Clean Water Act Section 404 Hydraulic Project Approval	Ecology Corps WDFW	Stream Protection	$359,000	1.2%	9' steel culvert crossing with four in-stream weirs.
		Totals	$3,465,000	11.4%	

This project took advantage of its length by providing several small ponds and bioswales, minimizing right-of-way costs and impacts to adjacent farmland. All of the wetland mitigation was done on-site with over $500,000 being spent on post construction plant establishment.

4.3%

Stormwater – $1.30M

5.9%

Wetland – $1.81M

1.2%

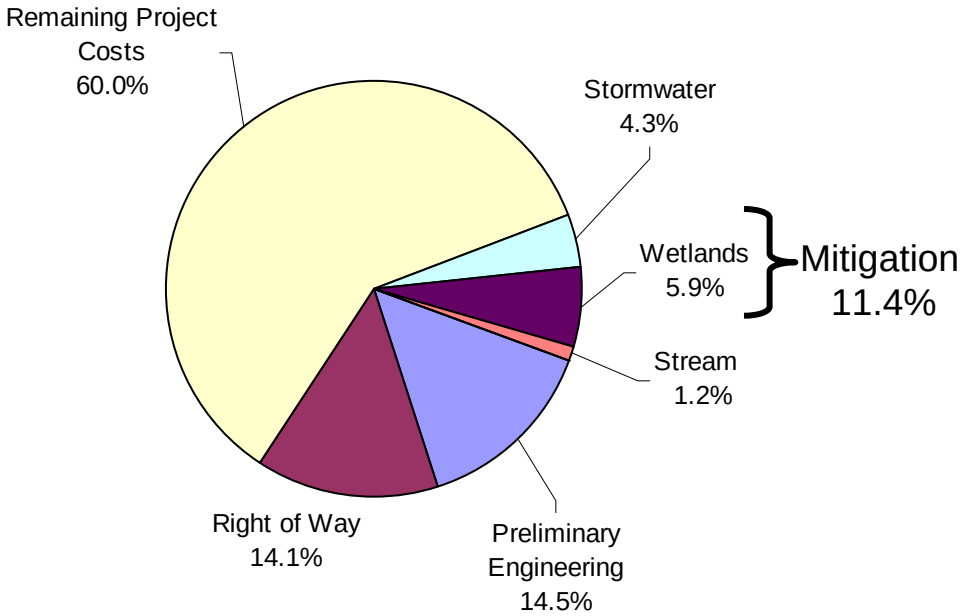
Stream – $0.36M

SR 270 Pullman to Idaho State Line

Phase Costs	
Preliminary Engineering	$4.4M
Right of Way	$4.3M
Construction	$21.7M
Total	$30.4M

Mitigation Costs		
Mitigation Elements	**Total Mitigation Cost**	**% of Total Project Cost**
Stormwater	$1.30M	4.3%
Wetland	$1.81M	5.9%
Stream	$0.36M	1.2%
Total of Mitigation Elements	$3.47M	**11.4%**
All Other Items	$26.93M	
Total	$30.4M	

Cost Breakdown



<u>Lane Mile Cost Equivalence:</u>

Added 2+ lanes at $1.6M per lane mile.

Total project cost is $30.4M for 18.8 new lane miles.

Minus the cost for mitigation - $1.4M per lane mile

SR 24 – SR 241 to Cold Creek Passing lanes

This section of SR 24 is traveled daily by Hanford commuters and experiences heavy truck traffic, particularly during harvest season. The project added passing lanes on a long grade to provide opportunities to pass slow moving trucks, also improving safety by reducing accidents along this section. This intersection has experienced a significant number of accidents and has been classified as a high accident location. Construction activities began in March 2008 and were completed in October 2008.

Mitigation Types: stormwater

SR 24 – SR 241 to Cold Creek Passing lanes					
Significant Mitigation Drivers	**Agency**	**Mitigation Categories**	**Mitigation Cost**	**% of Project Cost**	**Mitigation Comments**
Clean Water Act Section 402	Ecology	Stormwater Facilities	$216,000	6.4%	Primarily consists of natural dispersion.
		Totals	$216,000	6.4%	

6.4%

Stormwater – $0.22M

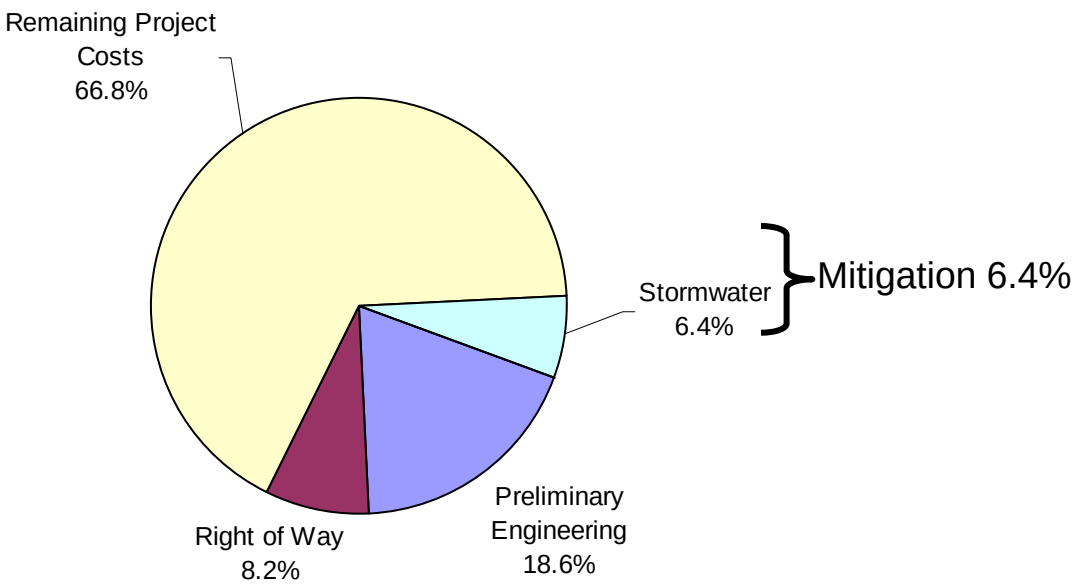
The project used natural dispersion adjacent to the roadway and energy dissipation pads at the ends of culverts for this project, treating nearly 19 acres of impervious surface. Roadside infiltration (natural dispersion) is an excellent method for stormwater treatment where there are good soil conditions, the space is available and rainfall is limited.

SR24 – SR 241 to Cold Creek Passing Lanes

Phase Costs	
Preliminary Engineering	$0.62M
Right of Way	$0.28M
Construction	$2.45M
Total	$3.35M

Mitigation Costs		
Mitigation Elements	**Total Mitigation Cost**	**% of Total Project Cost**
Stormwater	$0.22M	6.4%
Total of Mitigation Elements	$0.22M	**6.4%**
All Other Items	$3.13M	
Total	$3.35M	

Cost Breakdown



<u>Lane Mile Cost Equivalence:</u>

Added 2 passing lanes at $0.72M per lane mile.

Total project cost is $3.35M for 4.64 new lane miles.

Minus the cost for mitigation – $0.67M per lane mile.

US 12 Frenchtown to Walla Walla

Pine Street Interchange (Preliminary Concept)
Modified Diamond Interchange

This project is a result of a corridor study plan for US 12 between Snake River Bridge and the City of Walla Walla. Eight miles of two lane highway were converted to a four-lane divided highway, which required moving over 1.7 million yards of material. Other improvements included four intersections with channelization, a new interchange at Pine Street and roundabouts at the ramp termini. The project benefits include improved safety, decreased congestion and enhanced economic vitality. Construction activities began in March 2008 and are expected to be open to traffic by Fall 2009.

Mitigation Types: stormwater, context sensitive solutions

US 12 Frenchtown to Walla Walla

Significant Mitigation Drivers	Agency	Mitigation Categories	Mitigation Cost	% of Project Cost	Mitigation Comments
Clean Water Act Section 402	Ecology	Stormwater Facilities	$2,267,000	4.0%	A combination of infiltration ponds and ditches with check dams were utilized to treat stormwater.
Clean Water Act Section 401 Clean Water Act Section 404 Hydraulic Project Approval	Ecology Corps WDFW	Stream	$35,000	0.1%	Primarily consisted of underdrain construction for a natural spring.
National Highway System Designation Act 1995	US12 Coalition	CSS	$265,000	0.5%	City of Walla Walla community gateway landscaping including a sign and decorative concrete. Formline patterned the sub-structure.
		Totals	$2,567,000	4.6%	

Natural dispersion and infiltration ponds were used to treat over 103 acres of impervious surface within the existing corridor right-of-way. A natural spring within the project limits required the construction of an underdrain to allow its natural flow. Context sensitive solutions were designed and implemented through the collaborative efforts of the US12 Coalition, which includes WSDOT, local agencies and business.

Stormwater – $2.27M

Stream – $0.04M

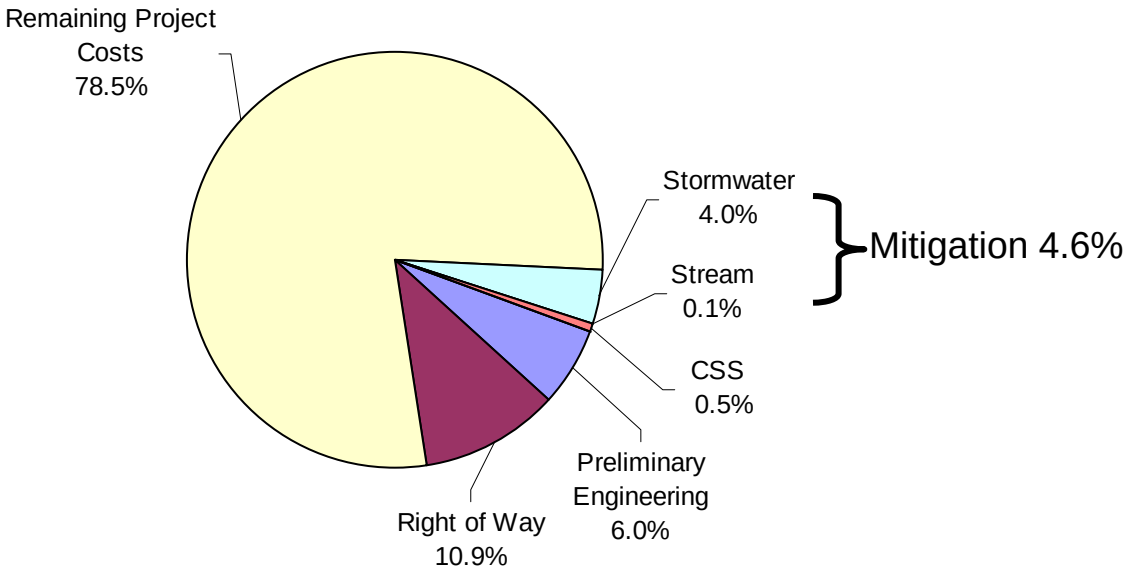
CSS – $0.27M

US 12 Frenchtown to Walla Walla

Phase Costs	
Preliminary Engineering	$3.39M
Right of Way	$6.15M
Construction	$47.04M
Total	$56.58M

Mitigation Costs		
Mitigation Elements	**Total Mitigation Cost**	**% of Total Project Cost**
Stormwater	$2.27M	4.0%
Stream	$0.04M	0.1%
CSS	$0.27M	0.5%
Total of Mitigation Elements	$2.58M	**4.6%**
All Other Items	$54.00M	
Total	$56.58M	

Cost Breakdown



<u>Lane Mile Cost Equivalence:</u>

Widens to four lanes at $1.62M per lane mile.

Total project cost is $56.58M for 35 new lane miles.

Minus the cost for mitigation - $1.54M per lane mile.

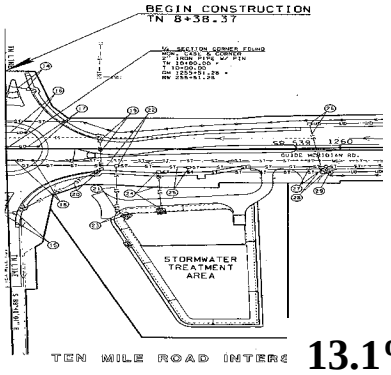
SR 539 Ten Mile Road to SR 546 Widening – Stage 1

This is the second of three projects that provides significant improvements along the SR 539 corridor. With over 20,000 daily drivers on this section of roadway and being a popular freight route for trucks, traffic has exceeded the capacity of the highway. Over four miles of narrow two-lane highway will be transformed into a four-lane divided facility with roundabouts at key intersections. The project began construction in Spring 2008 and is expected to be complete by the Fall 2009.

Mitigation Types: stormwater, wetland, stream

SR 539 Ten Mile Rd. to SR 546 Widening - Stage 1					
Significant Mitigation Drivers	**Agency**	**Mitigation Categories**	**Mitigation Cost**	**% of Project Cost**	**Mitigation Comments**
Clean Water Act Section 402	Ecology	Stormwater Facilities	$12,341,000	13.1%	10 ponds, 2 bioswales and ecology embankment occupying 3.4 acres of land treated over 43 acres of impervious surface.
Clean Water Act Section 404 Clean Water Act Section 401	Corps Ecology	Wetland	$8,720,000	9.3%	Nearly 12 acres of total wetland impact, mitigated with over 13 acres of new or enhanced wetlands plus 5 acres of on-site re-establishment.
Clean Water Act Section 401 Clean Water Act Section 404 Hydraulic Project Approval	Ecology Corps WDFW	Stream	$1,211,000	1.3%	Two box culverts constructed for flood plain overflow.
		Totals	$22,272,000	23.7%	

11 parcels were partially or completely acquired for stormwater facilities, costing over $2M in right-of-way. 5 additional parcels were acquired for wetland mitigation at a cost of $0.8M.

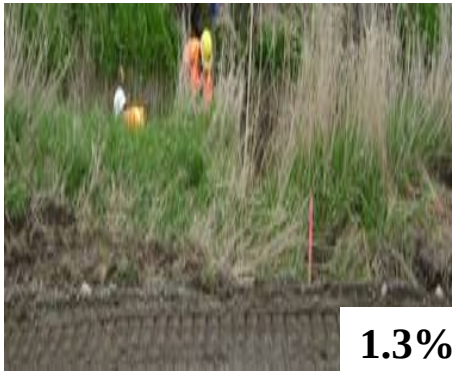


13.1%

Stormwater – $12.34M

9.3%

Wetland – $8.72M



1.3%

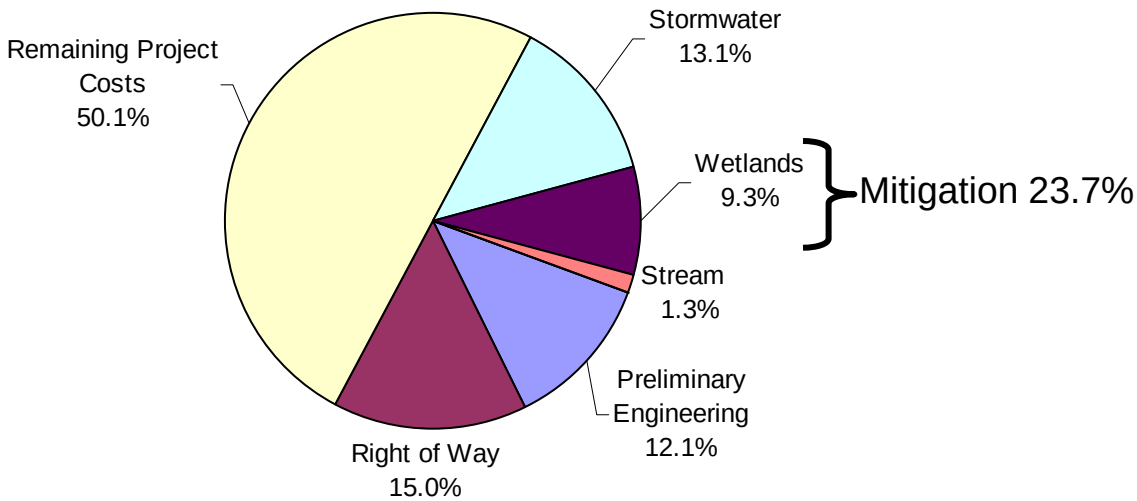
Stream – $1.21M

SR 539 Ten Mile Rd. to SR 546 Widening - Stage 1

Phase Costs	
Preliminary Engineering	$11.36M
Right of Way	$14.05M
Construction	$68.48M
Total	$93.89M

Mitigation Costs		
Mitigation Elements	**Total Mitigation Cost**	**% of Total Project Cost**
Stormwater	$12.34M	13.1%
Wetland	$8.72M	9.3%
Stream	$1.21M	1.3%
Total of Mitigation Elements	$22.27M	**23.7%**
All Other Items	$71.62M	
Total	$93.89M	

Cost Breakdown



<u>Lane Mile Cost Equivalence:</u>

Adds 2+ lanes at $9.4M per lane mile.

Total project cost is $93.89M for 10 new lane miles.

Minus the cost for mitigation - $7.2M per lane mile.

SR 522 UW Bothell/Cascadia Community College Campus Access

Congestion at the north entrance to the UW Bothell/Cascadia Community College coupled with a continuous growth in student population are the primary drivers for this project. A new south access from SR 522 will be constructed along with an exclusive exit lane to the campus from the I-405 to westbound SR 522 off-ramp. A new bridge will also be constructed over the campus access street for the I-405 off-ramps. Construction activities began in April 2008 and are scheduled for completion in Fall 2009.

Mitigation Types: stormwater, stream, wetland

SR 522 UW Bothell/Cascadia Community College Campus Access

Significant Mitigation Drivers	Agency	Mitigation Categories	Mitigation Cost	% of Project Cost	Mitigation Comments
Clean Water Act Section 402	Ecology	Stormwater Facilities	$5,467,000	11.1%	With limited space for stormwater facilities a 0.2 acre pond, detention vault and a minimal amount of ecology embankment was utilized, treating 4.22 acres of impervious.
Clean Water Act Section 404 Clean Water Act Section 401	Corps Ecology	Wetlands Restoration	$17,000	<0.1%	This project applied surplus wetland credits from the N. Creek Relocation and floodplain restoration completed during the construction of UW/Cascadia CC Campus.
Clean Water Act Section 402 Hydraulic Project Approval	Ecology WDFW	Stream Protection	$3,000	<0.1%	Minimal stream bank protection during pile driving, primarily requiring stream bank plantings.
		Totals	$5,487,000	11.2%	

A majority of the 11.1% spent on stormwater mitigation is attributed to temporary efforts including a sand filtration system. The application of surplus wetland credits from the North Creek relocation and floodplain restoration project completed during the construction of the UW Bothell Cascadia Community College campus saved cost on this project from wetland impacts.

11.1%

Stormwater – $5.47M

0.1%

Wetland – $0.01M

0.1%

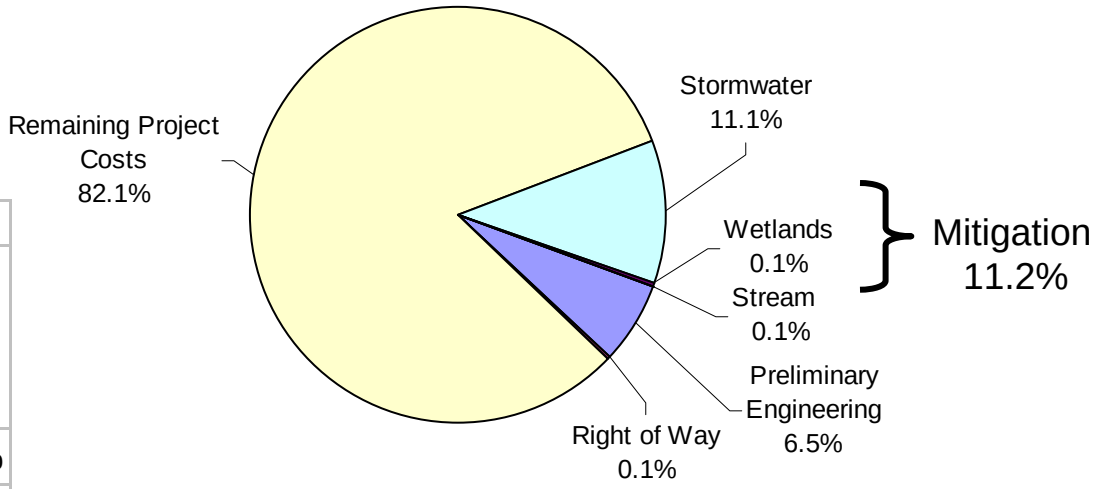
Stream – $0.01M

SR 522 UW Bothell/Cascadia Community College Campus

Phase Costs	
Preliminary Engineering	$3.21M
Right of Way	$0.06M
Construction	$45.77M
Total	$49.04M

Mitigation Costs		
Mitigation Elements	**Total Mitigation Cost**	**% of Total Project Cost**
Stormwater	$5.47M	11.1%
Wetland	$0.01M	0.1%
Stream	$0.01M	<0.1%
Total of Mitigation Elements	$5.49M	**11.2%**
All Other Items	$43.55M	
Total	$49.04M	

Cost Breakdown



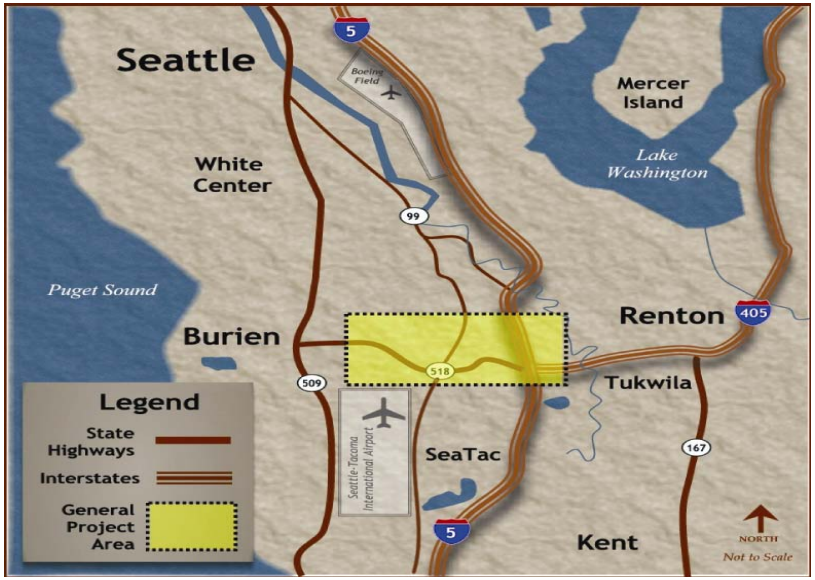
Lane Mile Cost Equivalence:

Adds ramps/access at $22.29M per lane mile.

Total project cost is $49.04M for 2.2 new lane miles.

Minus the cost for mitigation - $19.80M per lane mile.

SR 518 SeaTac Airport to I-5/I-405 Interchange



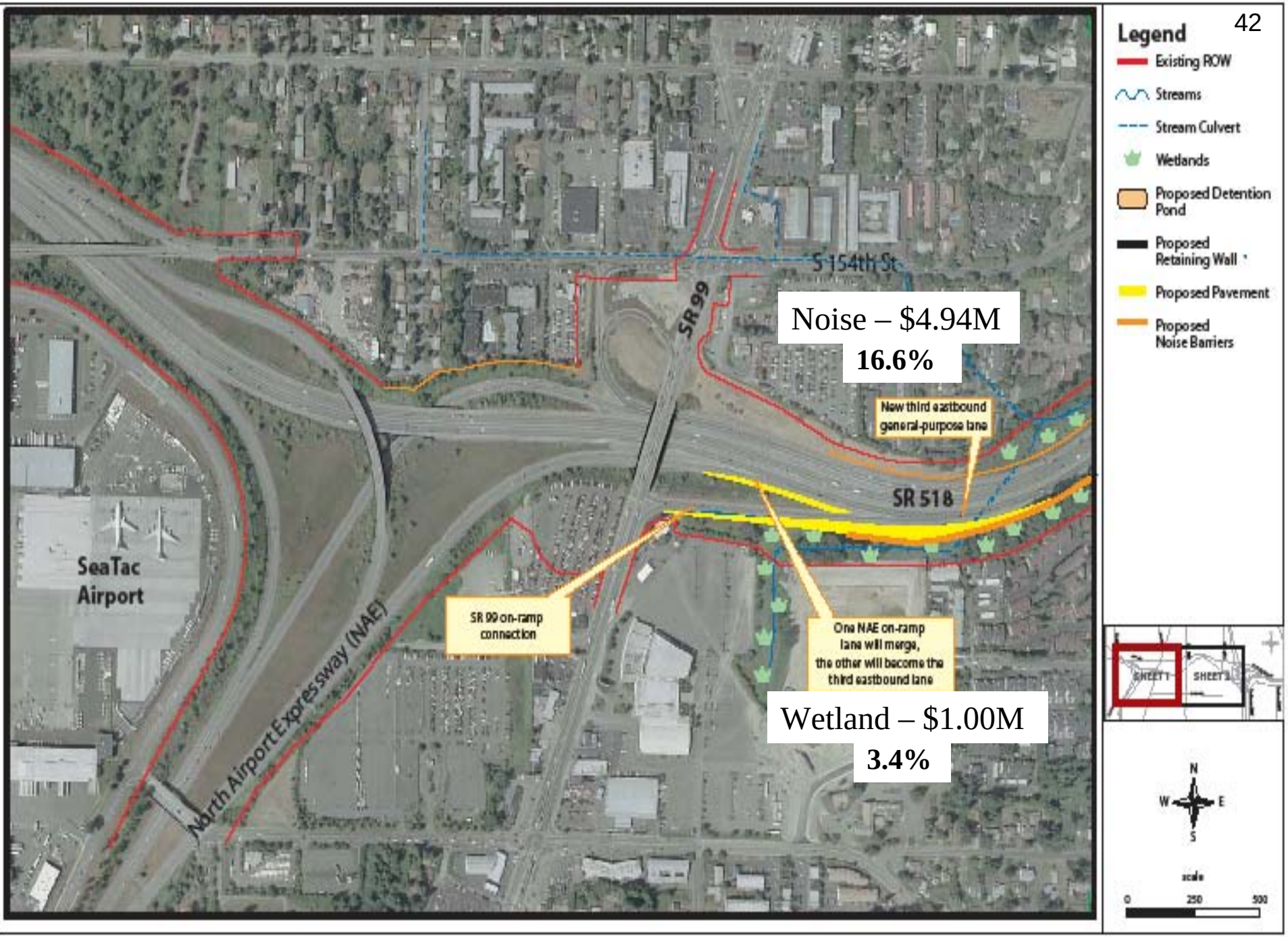
80% of the traffic to the SeaTac Airport travel on SR 518. With a continual increase in demand, SR 518 traffic is projected to experience more than thirty minute delays with back-ups nearly to the airport garage. This project improves mobility and safety by constructing a third eastbound lane between the north airport expressway and the I-5/I-405 interchange. Construction activities began in July 2007 and are scheduled for completion in Fall 2009.

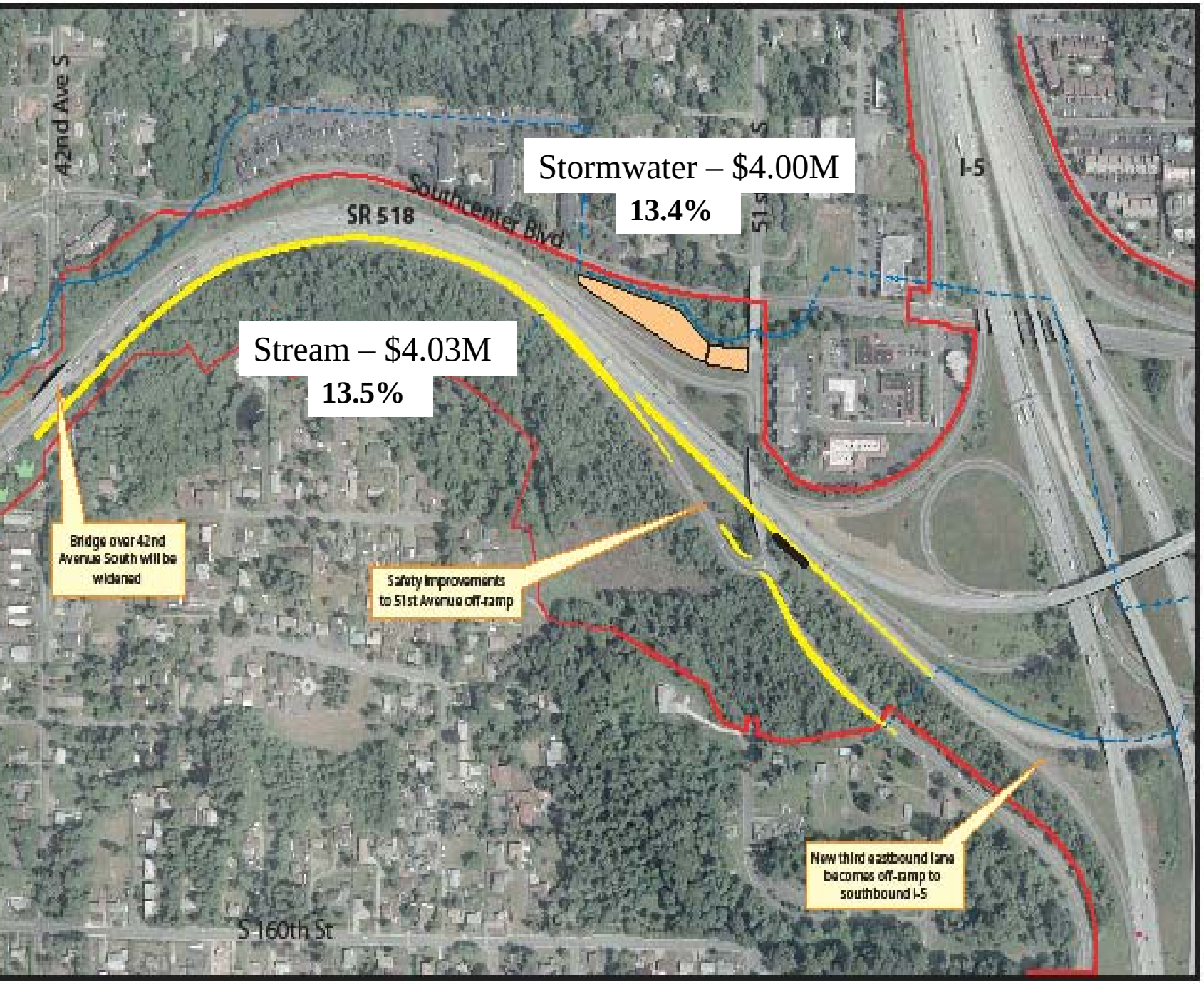
Mitigation Types: stormwater, wetland, stream, noise

SR 518 SeaTac Airport to I-5/I-405 Interchange

Significant Mitigation Drivers	Agency	Mitigation Categories	Mitigation Cost	% of Project Cost	Mitigation Comments
Clean Water Act Section 402	Ecology	Stormwater Facilities	$3,999,000	9.9%	Primarily used ecology embankment, pond and erosion control plantings to treat over 8 acres of impervious.
Clean Water Act Section 404 Clean Water Act Section 401	Corps Ecology	Wetlands Restoration	$1,000,000	2.5%	Purchased wetland bank credits from Springbrook.
Clean Water Act Section 401 Clean Water Act Section 402 Hydraulic Project Approval	Ecology Ecology WDFW	Stream Protection	$4,027,000	10.0%	Structural earth wall for impact avoidance in addition to stream enhancements.
FHWA Noise Abatement Criteria	FHWA	Noise	$4,942,000	12.2%	Noise barriers and walls covering over 1.6 acres.
		Totals	$13,968,000	34.6%	

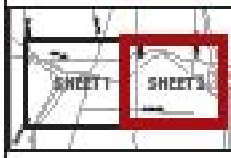
The proposed project will make beneficial improvements to existing environmental conditions. Noise walls will be installed to reduce traffic noise for neighborhoods. Runoff from the highway will be treated to enhance overall water quality conditions. Stormwater detention facilities and structural earth walls will be provided to protect Gilliam Creek.


Legend
Existing ROW
Streams
Stream Culvert
Wetlands
Proposed Detention Pond
Proposed Retaining Wall
Proposed Pavement
Proposed Noise Barriers
S 154th St
SR 99
SR 518
SeaTac Airport
North Airport Expressway (NAE)
New third eastbound general-purpose lane
SR 99 on-ramp connection
One NAE on-ramp lane will merge, the other will become the third eastbound lane
Noise – $4.94M
16.6%
Wetland – $1.00M
3.4%
SHEET 1
SHEET 2
N
W
E
S
scale
0
250
500



Legend

- Existing ROW
- Streams
- Stream Culvert
- Wetlands
- Proposed Deten Pond
- Proposed Retaining Wall
- Proposed Paven
- Proposed Noise Barriers



scale

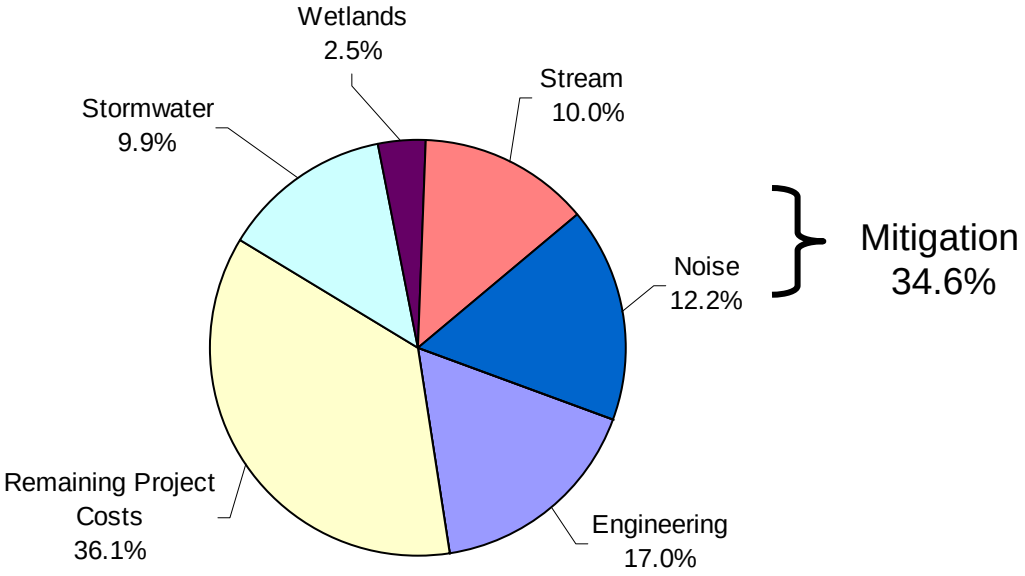
0 250

SR 518 SeaTac Airport to I-5/I-405 Interchange

Phase Costs	
Preliminary Engineering	$6.96M
Wetland Bank/Port Project	$1.25M
Construction	$32.23M
Total	$40.44M

Mitigation Costs		
Mitigation Elements	**Total Mitigation Cost**	**% of Total Project Cost**
Stormwater	$4.00M	9.9%
Wetland	$1.00M	2.5%
Stream	$4.03M	10.0%
Noise	$4.94M	12.2%
Total of Mitigation Elements	$13.37M	**34.6%**
All Other Items	$27.07M	
Total	$40.44M	

Cost Breakdown



<u>Lane Mile Cost Equivalence:</u>

Adds new ramps/access at $28.1M per lane mile.

Total project cost is $40.44M for 1.44 new lane miles.

Minus the cost for mitigation - $18.8M per lane mile.

I-5/SR502 Interchange

This project was the result of a 2-year study for the I-5/I-205 north corridor and extensive public involvement. The new interchange provides congestion relief and improved safety for I-5 as well as adjacent interchanges. Construction activities began in Spring 2007 and were completed in Fall 2008.

Mitigation Types: stormwater, wetland, stream

I-5/SR 502 Interchange

Significant Mitigation Drivers	Agency	Mitigation Categories	Mitigation Cost	% of Project Cost	Mitigation Comments
Clean Water Act Section 402	Ecology	Stormwater Facilities	$5,574,000	10.8%	9 ponds and ecology embankment requiring over 8 acres of land and treating over 26 acres of impervious surface.
Clean Water Act Section 404 Clean Water Act Section 401	Corps Ecology	Wetlands Restoration	$5,787,000	11.2%	Wetlands were mitigated within the project area, replacing nearly 12 acres of impact with 27 acres of created and enhanced wetlands with another 16 acres of wetland buffer.
Clean Water Act Section 401 Clean Water Act Section 402 Hydraulic Project Approval	Ecology Ecology WDFW	Stream Protection	$306,000	0.6%	Two 10' steel culverts were installed with natural stream re-establishment.
		Totals	$10,009,000	22.6%	

Stormwater treatment facilities and the creation of wetlands had a cost of nearly $2 million combined just for adjacent property acquisition.

Stormwater – $5.57M

Wetland – $5.79M

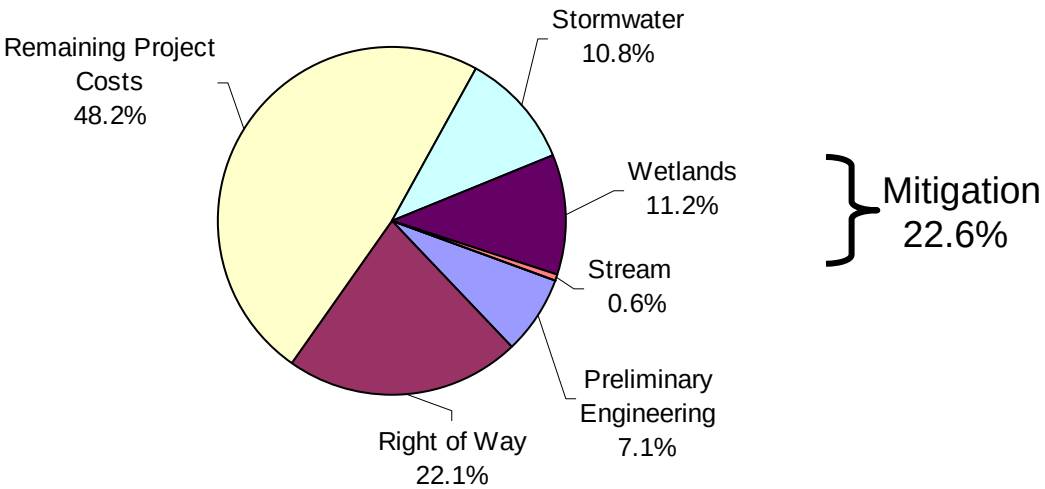
Stream – $0.30M

I-5/SR 502 Interchange

Phase Costs	
Preliminary Engineering	$3.68M
Right of Way	$11.45M
Construction	$36.60M
Total	$51.73M

Mitigation Costs		
Mitigation Elements	**Total Mitigation Cost**	**% of Total Project Cost**
Stormwater	$5.57M	10.8%
Wetland	$5.79M	11.2%
Stream	$0.30M	0.6%
Total of Mitigation Elements	$11.67M	**22.6%**
All Other Items	$40.06M	
Total	$51.73M	

Cost Breakdown



<u>Lane Mile Cost Equivalence:</u>

Adds new interchange at $7.29M per lane mile.

Total project cost is $51.73M for 7.1 new lane miles.

Minus the cost for mitigation - $5.64M per lane mile.

SR 500/I-205 Interchange Improvements

Increasing traffic volumes in conjunction with a short merge lane on westbound SR 500 created a highly congested area and an increased rick for collisions. The project lengthened the merge lane beyond the interchange area to help reduce the accident risk and improve overall operations. Construction activities began in Spring 2008 and were completed in June 2008.

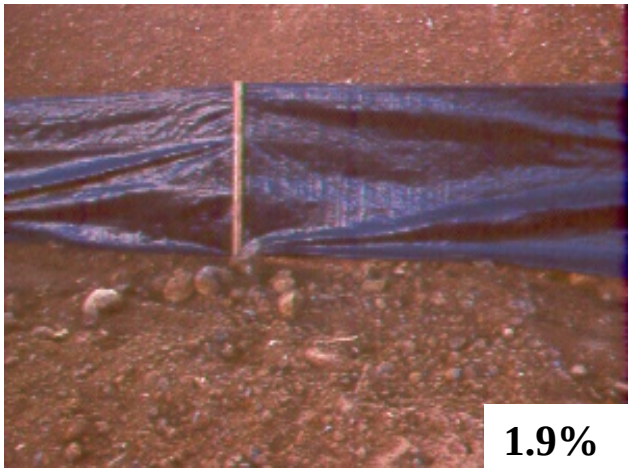
Mitigation Types: stormwater (temporary), wetland

SR 500/I-205 Interchange Improvements

Significant Mitigation Drivers	Agency	Mitigation Categories	Mitigation Cost	% of Project Cost	Mitigation Comments
Clean Water Act Section 404 Clean Water Act Section 401	Corps Ecology	Wetlands Restoration	$66,000	10.5%	Wetland area plantings due to 0.022 acre of impact.
Clean Water Act Section 402	Ecology	Stormwater	$12,000	1.9%	Consisted of temporary mitigation. Did not meet or exceed thresholds for treatment.
		Totals	$78,000	12.4%	

10.5%

Wetland – $0.01M



1.9%

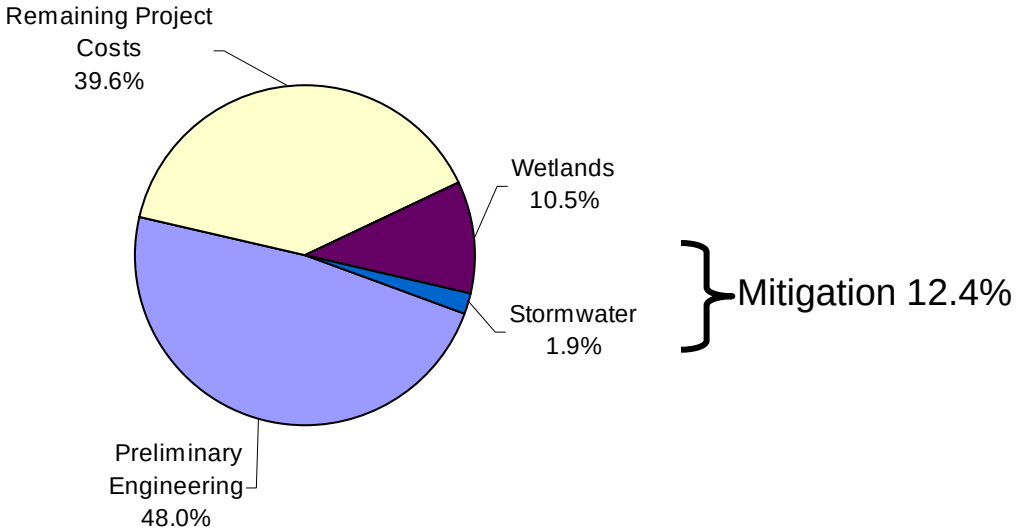
Stormwater – $0.01M

SR 500/I-205 Interchange Improvements

Phase Costs	
Preliminary Engineering	$0.30M
Construction	$.33M
Total	$.63M

Mitigation Costs		
Mitigation Elements	**Total Mitigation Cost**	**% of Total Project Cost**
Wetland	$0.07M	10.5%
Stormwater	$0.01M	1.9%
Total of Mitigation Elements	$0.08M	**12.4%**
All Other Items	$0.55M	
Total	$0.63M	

Cost Breakdown



<u>Lane Mile Cost Equivalence:</u>

Extends existing ramp at $3.7M per lane mile.

Total project cost is $0.63M for 0.17 new lane miles.

Minus the cost for mitigation: $3.2M per lane mile.

US 2/97 Peshastin East Interchange

A safety corridor study conducted in 2002 recommended several short and long term improvements between the “Big Y” and Wenatchee. The intersection US 2 and SR 97 is one of the improvement areas identified during the study that has experienced a high accident rate. To improve safety at this location a grade separated tight-diamond interchange was constructed, providing grade separation and reduced conflicts between vehicles. In addition to the interchange there were several local system improvements completed for increased safety. Construction activities began in Spring 2008 and the project was opened to traffic in late Fall 2008.

Mitigation Types: stormwater, stream, CSS

US 2/97 Peshastin East Interchange

Significant Mitigation Drivers	Agency	Mitigation Categories	Mitigation Cost	% of Project Cost	Mitigation Comments
Clean Water Act Section 402	Ecology	Stormwater Facilities	$1,333,000	6.3%	A pond was constructed in an area utilized to place surplus excavation for the interchange, treating 7.5 acres of impervious surface.
Clean Water Act Section 402 Clean Water Act Section 404	Ecology Corps	Stream Protection	$20,000	0.1%	Widening of the roadway required stream re-alignment and a partial enclosed system.
NHS Designation Act 1995	County Community	CSS	$2,320,000	11.0%	Extensive coordination with the community and elected officials led to the inclusion of an orchard equipment, bicycle and pedestrian under-crossing.
		Totals	$3,673,000	17.4%	

Extensive coordination with the community and elected officials led to the inclusion of a bicycle, pedestrian and farm equipment under-crossing. The pond for stormwater treatment was constructed in area utilized to place surplus excavation from the interchange.

6.3%

Stormwater – $1.33M

0.1%

Stream – $0.02M

11.0%

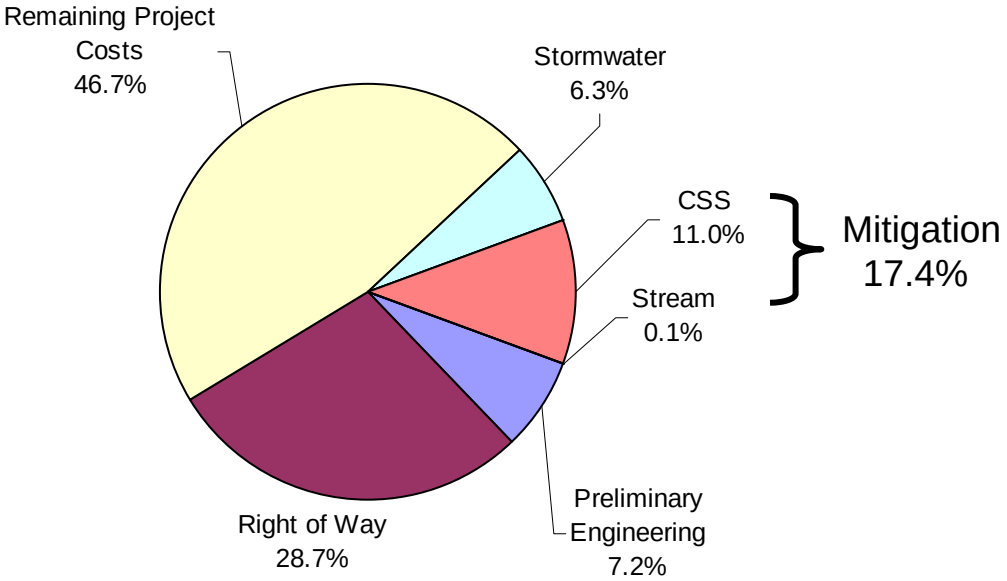
CSS – $2.32M

US 2/97 Peshastin East Interchange

Phase Costs	
Preliminary Engineering	$1.52M
Right of Way	$6.05M
Construction	$13.53M
Total	$21.10M

Mitigation Costs		
Mitigation Elements	**Total Mitigation Cost**	**% of Total Project Cost**
Stormwater	$1.33M	6.3%
Stream	$0.02M	0.1%
CSS	$2.32M	11.0%
Temporary	$0.16M	0.7%
Total of Mitigation Elements	$3.67M	**17.4%**
All Other Items	$17.43M	
Total	$21.10M	

Cost Breakdown



<u>Lane Mile Cost Equivalence:</u>

Adds new interchange at $7.3M per lane mile.

Total project cost is $21.1M for 2.88 new lane miles.

Minus the cost for mitigation - $6.1M per lane mile.

US 2/97 Wenatchee Trail Connection

The Apple Capitol Loop Trail (ACLT) is an integral part of the community and a heavily used pedestrian and bicycle route in the area. Previous to this project, the only connection between Olds Station area facilities and the ACLT was by crossing 4 lanes of highway or crossing railroad tracks to head north on US 97A. This project provides a safe connection between the Olds Station area and the ACLT by constructing a new bridge over the railroad and a new path. Construction activities began in July 2008 and are expected to be completed in Spring 2009.

Mitigation Types: stormwater, CSS

US 2/97 Wenatchee Trail Connection

Significant Mitigation Drivers	Agency	Mitigation Categories	Mitigation Cost	% of Project Cost	Mitigation Comments
Clean Water Act Section 402	Ecology	Stormwater Facilities	$44,000	2.7%	Small pond treating 0.7 acres of impervious surface
NHS Designation Act 1995	City	CSS	$78,000	4.7%	Wood rail fence with mesh
		Totals	$123,000	7.3%	

2.7%

Stormwater – $0.04M

4.7%

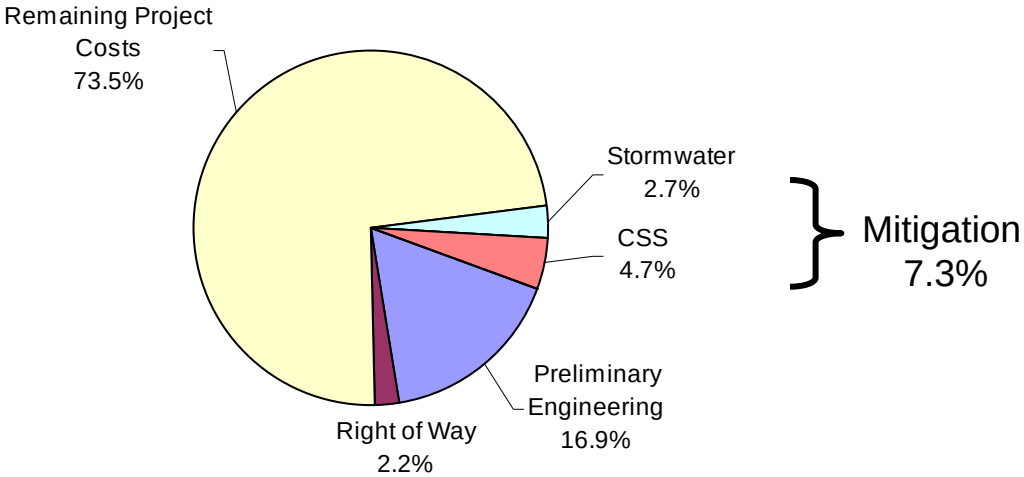
CSS – $0.08M

US 2/97 Wenatchee Trail Connection

Phase Costs	
Preliminary Engineering	$0.28M
Right of Way	$0.04M
Construction	$1.34M
Total	$1.66M

Mitigation Costs		
Mitigation Elements	**Total Mitigation Cost**	**% of Total Project Cost**
Stormwater	$0.04M	2.7%
CSS	$0.08M	4.7%
Total of Mitigation Elements	$0.12M	**7.3%**
All Other Items	$1.54M	
Total	$1.66M	

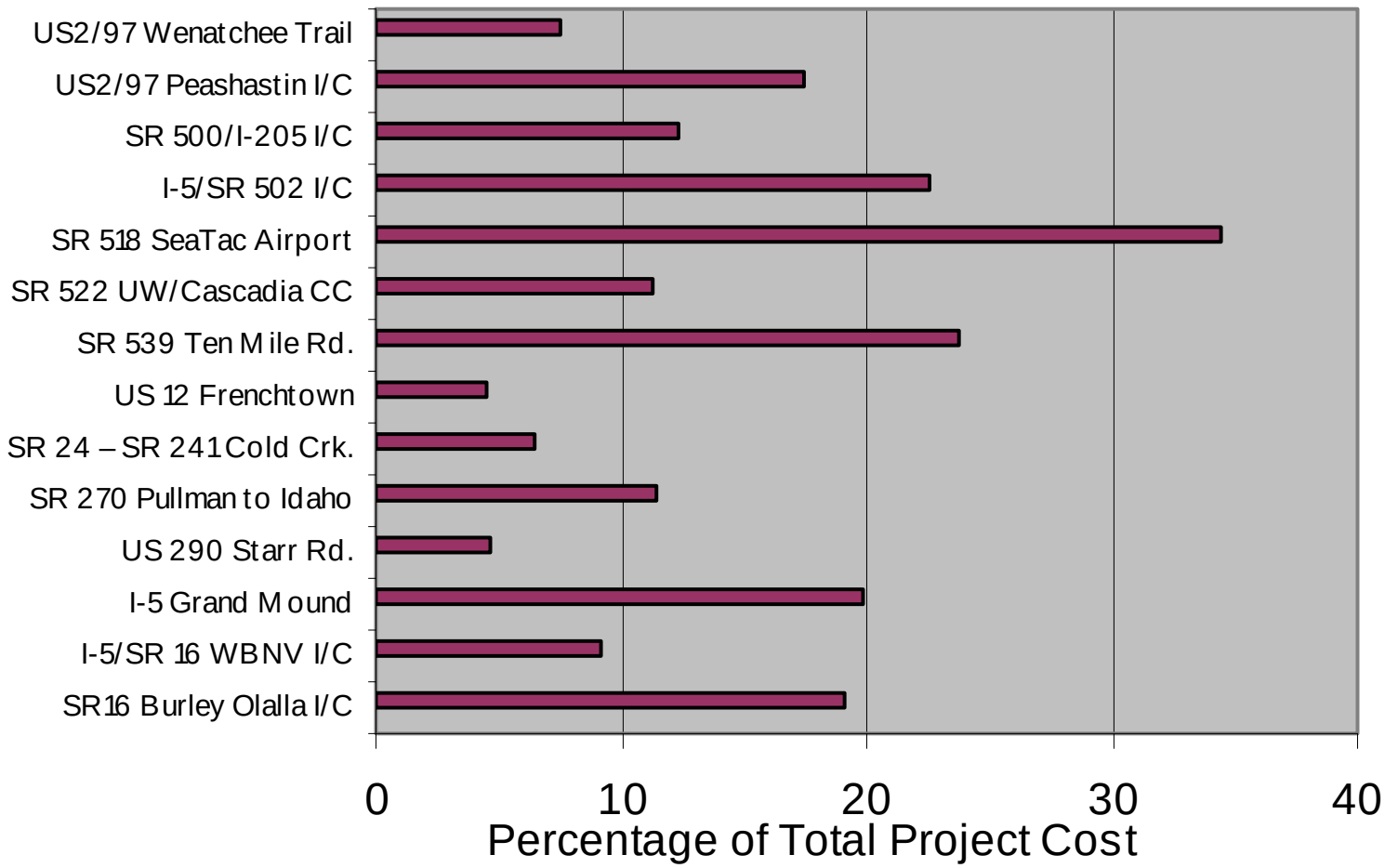
Cost Breakdown



Mitigation Summary Table

Project	Total Project Cost	Stormwater	Noise	Wetlands	Streams	CSS	Total Mitigation Cost	% of Project Cost
SR16 Burley Olalla I/C	$24.1	$2.64		$1.08	$0.87		$4.59	19.1%
I-5/SR 16 WBNV I/C	$205.0	$18.75					$18.75	9.1%
I-5 Grand Mound	$92.1	$16.77		$0.86	$0.73		$18.36	19.9%
US 290 Starr Rd.	$0.2	$0.01					$0.01	4.6%
SR 270 Pullman to Idaho	$30.4	$1.30		$1.81	$0.36		$3.47	11.4%
SR 24 – SR 241 Cold Crk.	$3.4	$0.22					$0.22	6.4%
US 12 Frenchtown	$56.6	$2.27			$0.04	$0.27	$2.58	4.6%
SR 539 Ten Mile Rd.	$93.9	$12.34		$8.72	$1.21		$22.27	23.7%
SR 522 UW/Cascadia CC	$49.0	$5.47		$0.01	$0.01		$5.49	11.2%
SR 518 SeaTac Airport	$40.4	$4.00	$4.94	$1.00	$4.03		$13.97	34.6%
I-5/SR 502 I/C	$51.7	$5.57		$5.79	$0.30		$11.67	22.6%
SR 500/I-205 I/C	$0.6	$0.01		$0.07			$0.08	12.4%
US2/97 Peashastin I/C	$21.1	$1.33			$0.02	$2.32	$3.67	17.4%
US2/97 Wenatchee Trail	$1.7	$0.04				$0.08	$0.12	7.3%
Totals	**$670.2**	**$70.72**	**$4.94**	**$19.34**	**$7.57**	**$2.67**	**$105.24**	

Mitigation Summary Chart



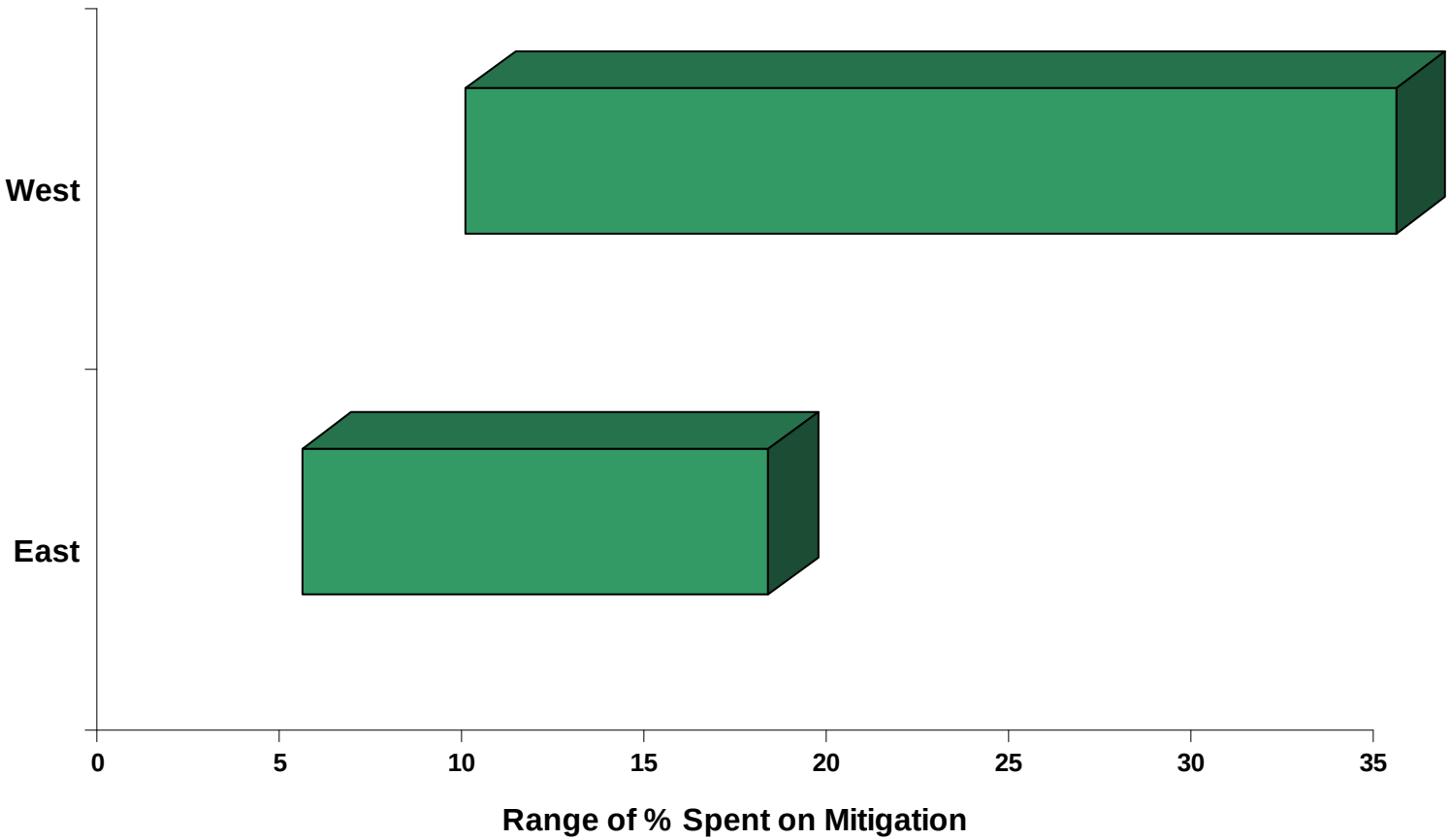
Cross-State Comparison

West Side Projects	Total Project Cost	Stormwater	Noise	Wetlands	Streams	CSS	Total Mitigation Cost	% of Project Cost
SR16 Burley Olalla I/C	$24.1	$2.64		$1.08	$0.87		$4.59	19.1%
I-5/SR 16 WBNV I/C	$205.0	$18.75					$18.75	9.1%
I-5 Grand Mound	$92.1	$16.76		$0.86	$0.73		$18.35	19.9%
SR 539 Ten Mile Rd.	$93.9	$12.34		$8.72	$1.21		$22.27	23.7%
SR 522 UW/Cascadia CC	$49.0	$5.47		$0.01	$0.01		$5.49	11.2%
SR 518 SeaTac Airport	$40.4	$4.00	$4.94	$1.00	$4.03		$13.97	34.6%
I-5/SR 502 I/C	$51.7	$5.57		$5.79	$0.30		$11.67	22.6%
SR 500/I-205 I/C	$0.6	$0.01		$0.07			$0.08	12.4%
Totals	**$556.8**	**$65.54**	**$4.94**	**$17.53**	**$7.15**		**$95.17**	

East Side Projects	Total Project Cost	Stormwater	Noise	Wetlands	Streams	CSS	Total Mitigation Cost	% of Project Cost
US 290 Starr Rd.	$0.2	$0.01					$0.01	4.6%
SR 270 Pullman to Idaho	$30.4	$1.30		$1.81	$0.36		$3.47	11.4%
SR 24 – SR 241 Cold Crk.	$3.4	$0.22					$0.22	6.4%
US 12 Frenchtown	$56.6	$2.27		$0.04		$0.27	$2.58	4.6%
US2/97 Peashastin I/C	$21.1	$1.33			$0.02	$2.32	$3.67	17.4%
US2/97 Wenatchee Trail	$1.7	$0.04				$0.08	$0.12	7.3%
Totals	**$113.4**	**$5.17**		**$1.85**	**$0.38**	**$2.67**	**10.07**	

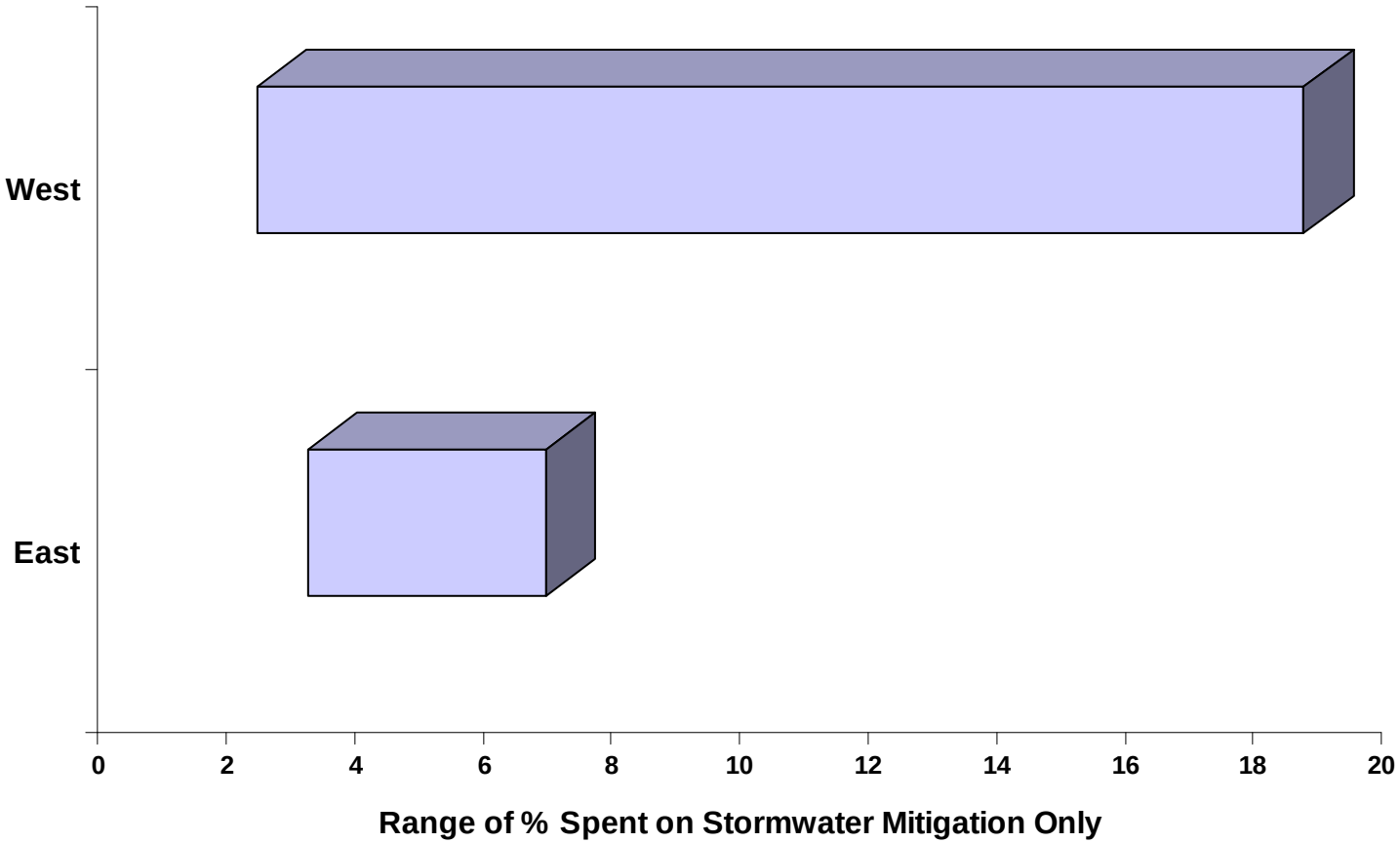
Cross-State Comparison

(All Mitigation)



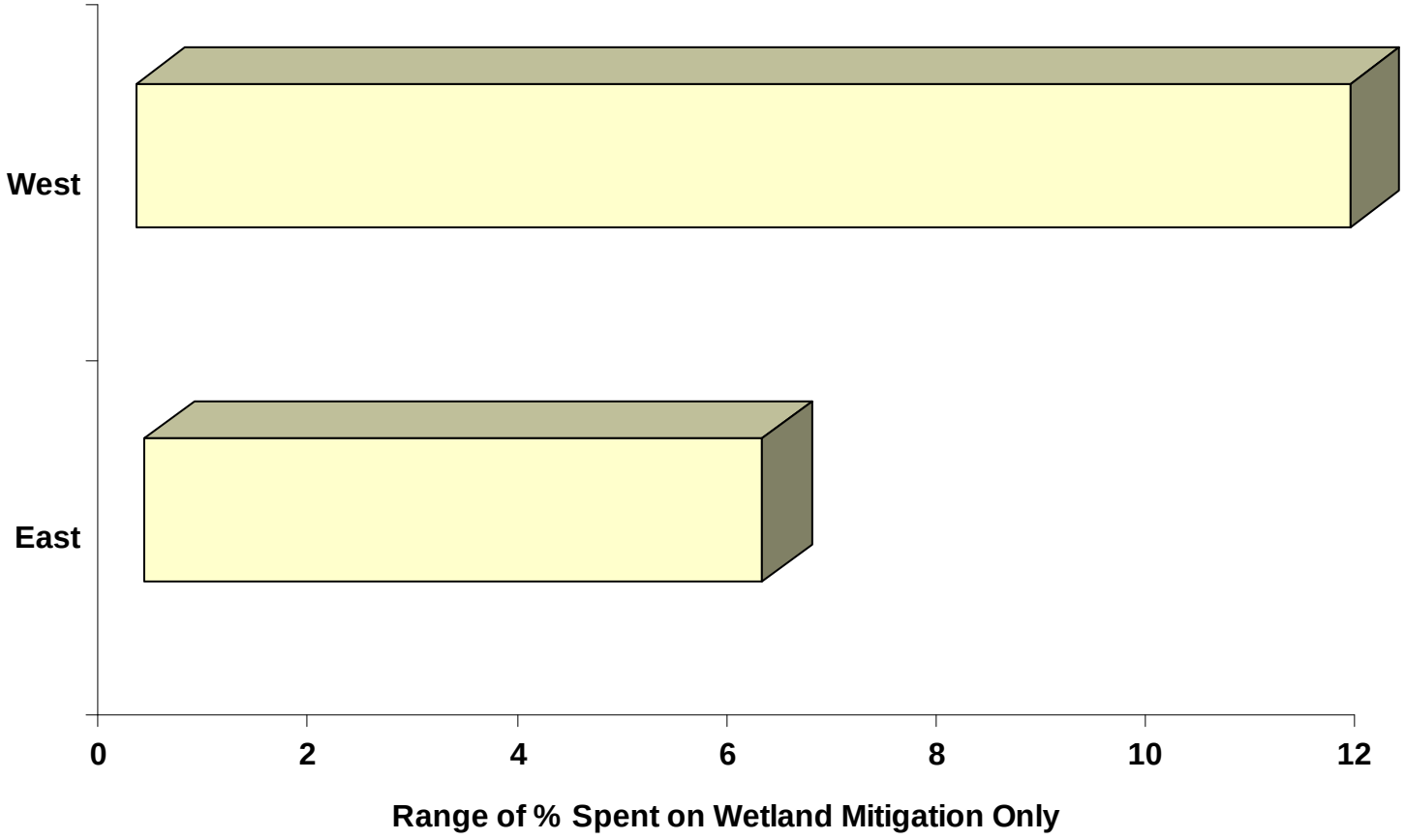
Cross-State Comparison

(Stormwater Mitigation Only)



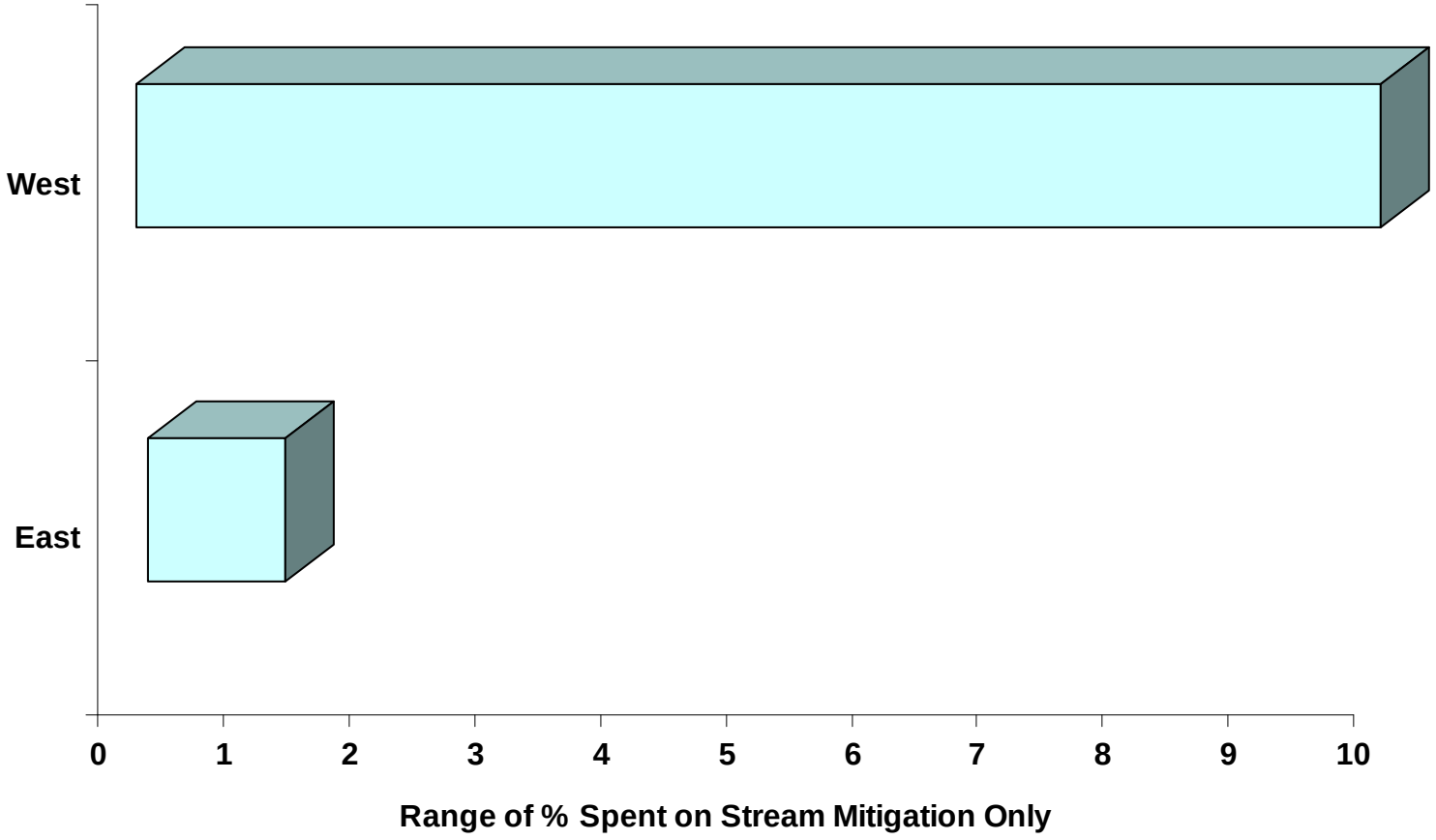
Cross-State Comparison

(Wetland Mitigation Only)



Cross-State Comparison

(Stream Mitigation Only)



Case Study Comparison by Project (03' to 09')

2003 Case Studies	Total Project Cost in Millions	Total Mitigation Costs in Millions	% of Project Cost Spent on Mitigation
US 2/20/153 NC WA	$0.28	$0.06	20%
SR 20 Tonasket	$4.32	$0.28	6%
I-5 Lacey	$7.96	$0.29	4%
US 395 Tri-Cities	$10.92	$1.16	10%
I-5 Tumwater	$11.22	$1.66	15%
US 12 Walla Walla	$10.20	$3.03	30%
SR 510 Lacey	$16.06	$2.26	14%
I-90 Spokane	$16.20	$1.96	12%
SR 14 Vancouver	$19.78	$0.43	2%
I-90 Spokane East	$36.12	$3.54	10%
SR 18 Maple Valley	$37.67	$7.84	21%
SR 202 Redmond	$61.83	$15.17	24%
I-90 Issaquah	$112.80	$13.80	12%
SR 18 Hobart	$82.08	$27.93	34%
Totals	**$427.44**	**$79.41**	

2006 Case Studies	Total Project Cost in millions	Total Mitigation Costs in Millions	% of Project Cost Spent on Mitigation
US 12 Walla Walla	$10.3	$0.2	1.0%
SR 270 Pullman	$29.9	$3.0	10.0%
I-5 HOV Tukwila	$38.7	$2.7	7.0%
SR 16 HOV	$72.0	$9.5	13.1%
I-5 HOV Tacoma	$107.6	$8.3	7.7%
I-405 Kirkland	$163.7	$34.9	21.0%
I-5 Everett HOV	$219.2	$53.5	24.4%
Totals	**$641.4**	**$112.1**	

2009 Case Studies	Total Project Cost in Millions	Total Mitigation Costs in Millions	% of Project Cost Spent on Mitigation
SR16 Burley Olalla I/C	$24.1	$4.59	19.1%
I-5/SR 16 WBNV I/C	$205.0	$18.75	9.1%
I-5 Grand Mound	$92.1	$18.35	19.9%
US 290 Starr Rd.	$0.2	$0.01	4.6%
SR 270 Pullman to Idaho	$30.4	$3.47	11.4%
SR 24 – SR 241 Cold Crk.	$3.4	$0.22	6.4%
US 12 Frenchtown	$56.6	$2.58	4.6%
SR 539 Ten Mile Rd.	$93.9	$22.27	23.7%
SR 522 UW/Cascadia CC	$49.0	$5.49	11.2%
SR 518 SeaTac Airport	$40.4	$13.97	34.6%
I-5/SR 502 I/C	$51.7	$11.67	22.6%
SR 500/I-205 I/C	$0.6	$0.08	12.4%
US2/97 Peashastin I/C	$21.1	$3.67	17.4%
US2/97 Wenatchee Trail	$1.7	$0.12	7.3%
Totals	**$670.2**	**$105.24**	

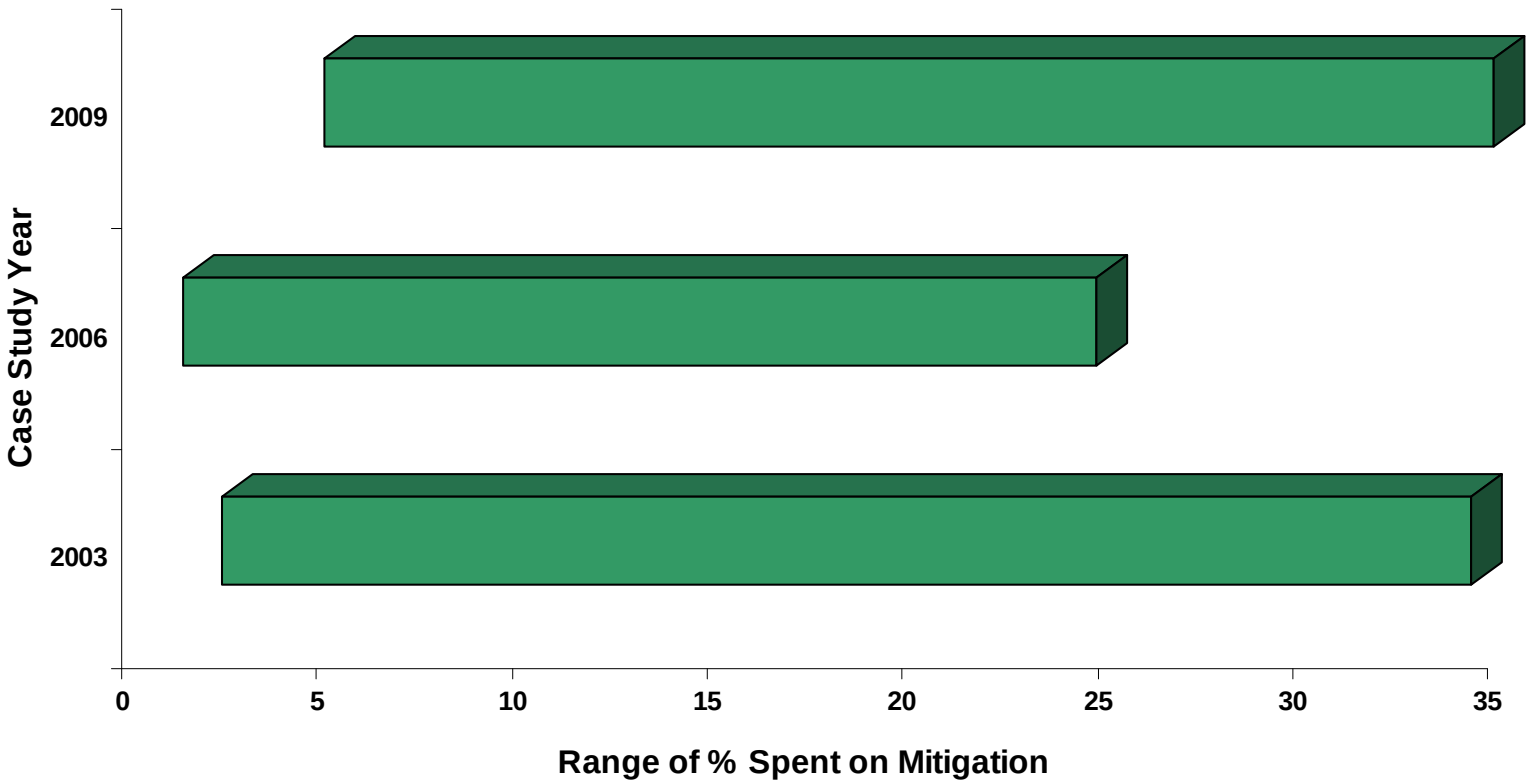
Case Study Comparison Summary

Case Study Year	Range of Project Costs in millions	Range of Total Mitigation Costs in Millions	Range of % Spent on Project Mitigation
2003	$0.28 to $112.8	$0.06 to $27.9	2% to 34%
2006	$10.3 to $219.2	$0.2 to $53.5	1% to 24%
2009	$0.25 to $205.0	$0.01 to $22.3	4.6% to 35%

The first study, conducted in 2003, included fourteen projects consisting of rural and medium to large sized urban mobility projects. A second study was conducted in 2006 using seven projects, primarily consisting of large urban mobility type projects. This study concentrates on a balance of project types and sizes across the state. Fourteen projects were included in this study. The above table shows the range of costs and percentages of mitigation between study years.

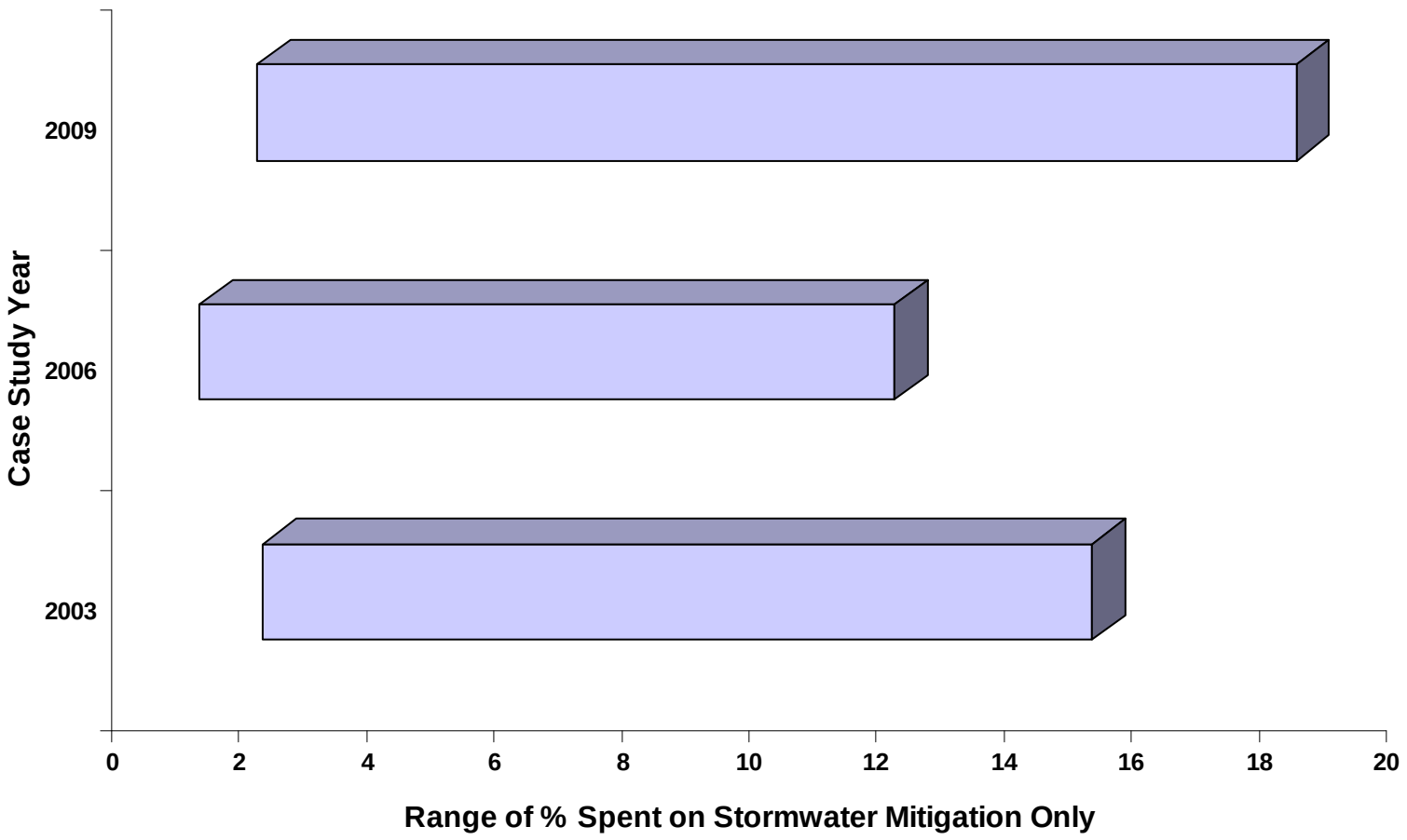
Case Study Comparison

(All Mitigation)



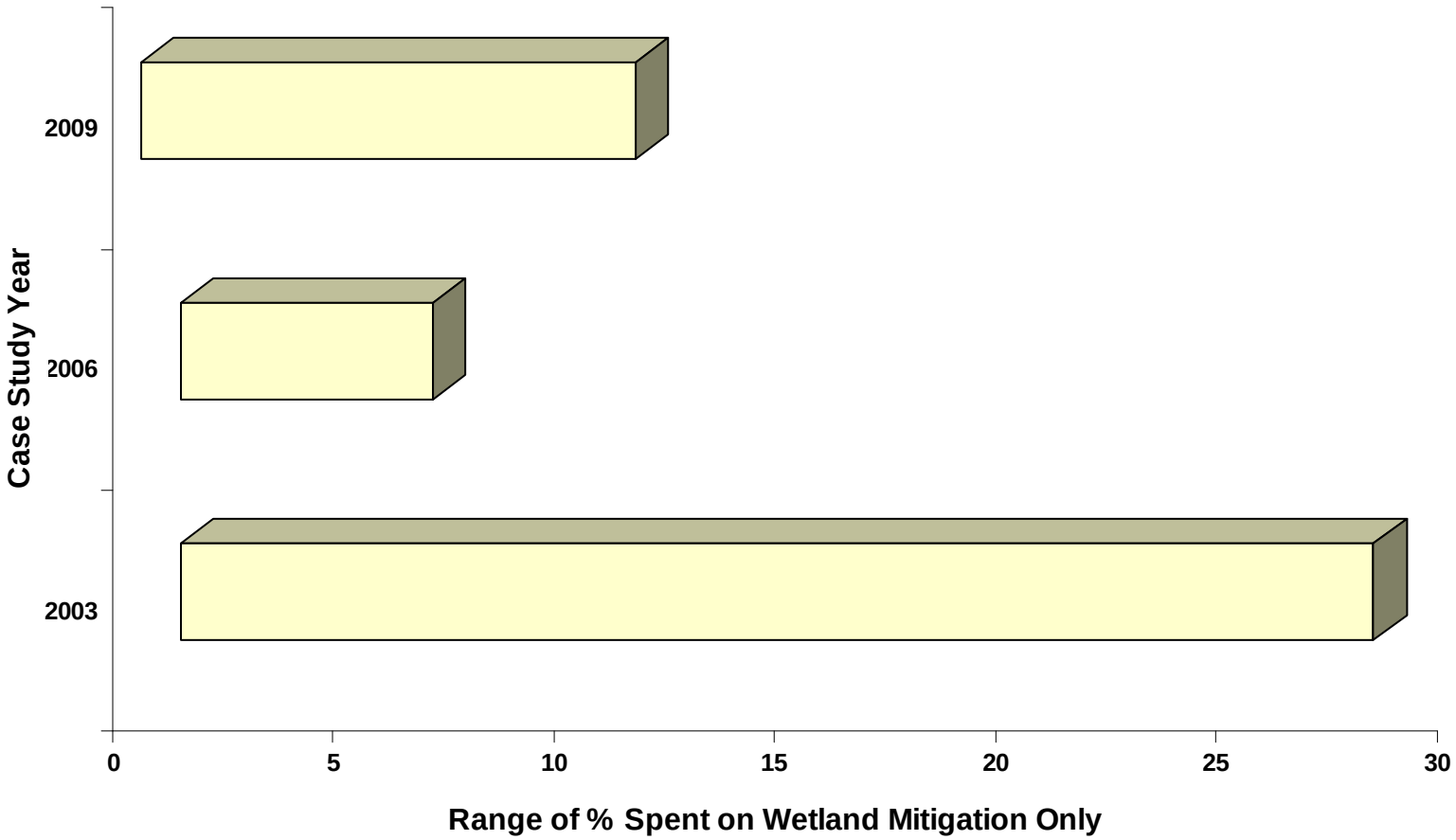
Case Study Comparison

(Stormwater Mitigation Only)



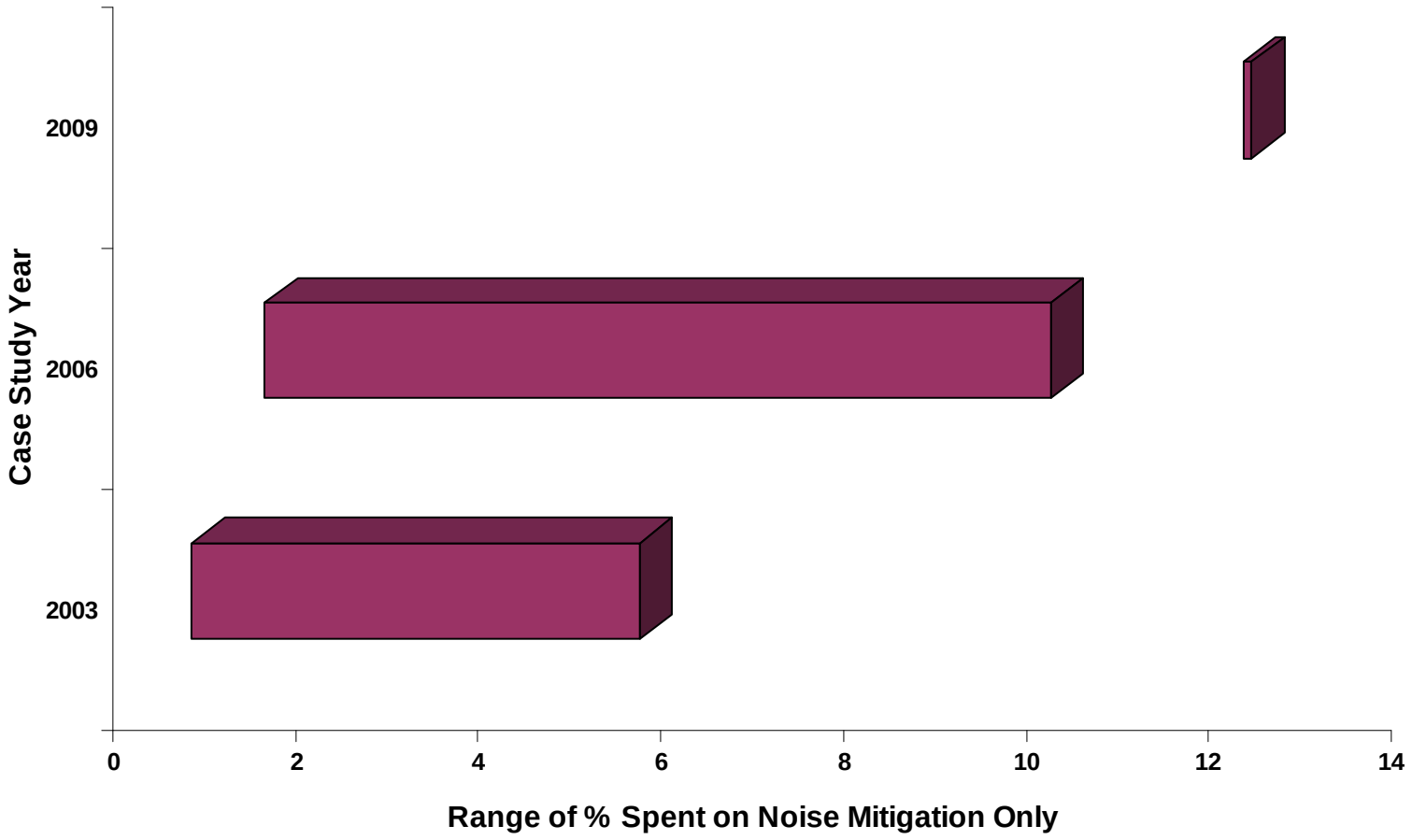
Case Study Comparison

(Wetland Mitigation Only)



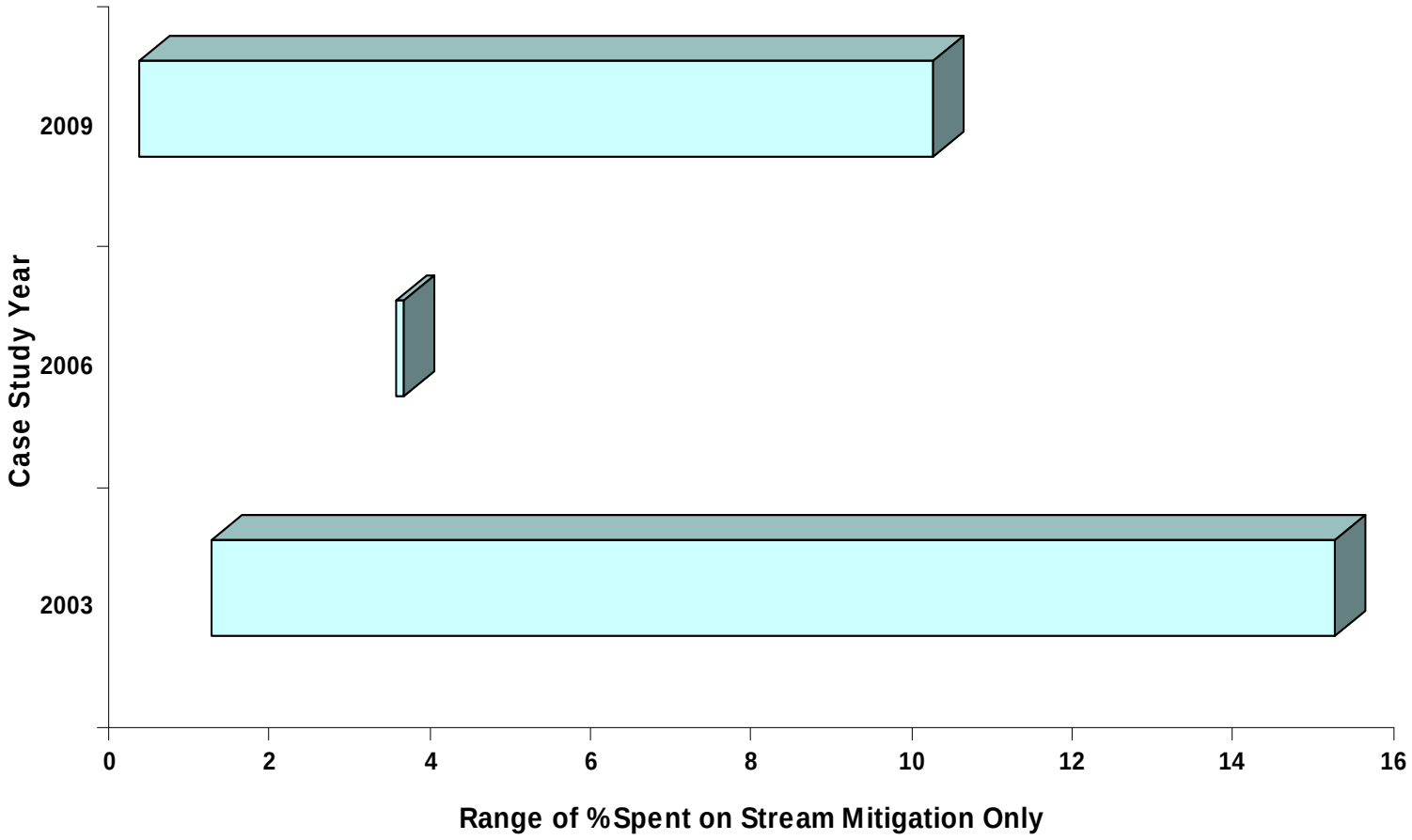
Case Study Comparison

(Noise Mitigation Only)



Case Study Comparison

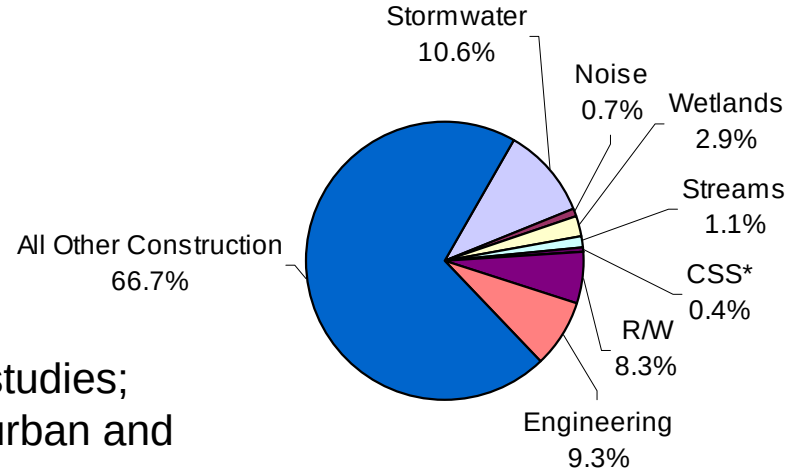
(Stream Mitigation Only)



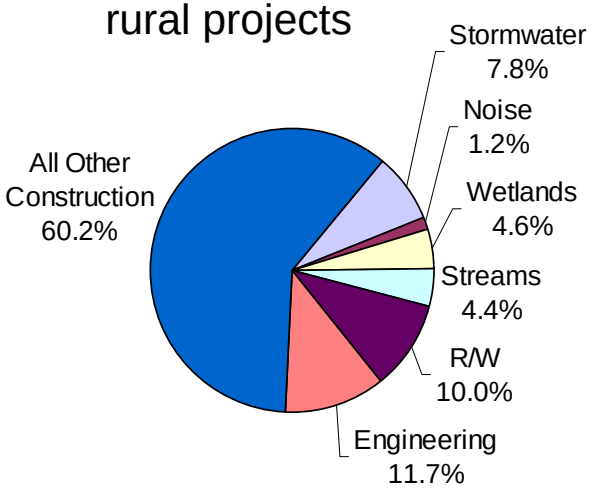
Case Study Comparison

(All Project Costs)

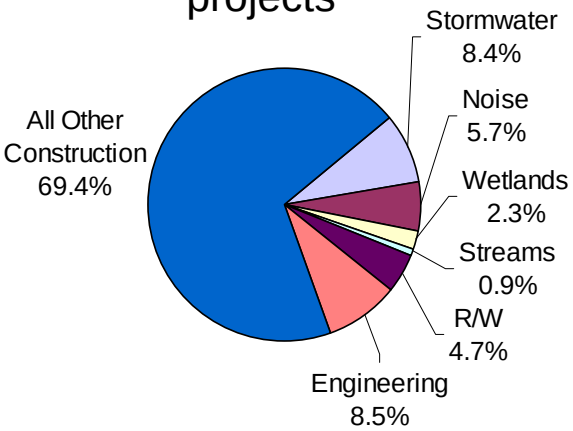
2009 case studies; balance of urban and rural projects



2003 case studies; balance of urban and rural projects



2006 case studies; mostly urban mobility projects

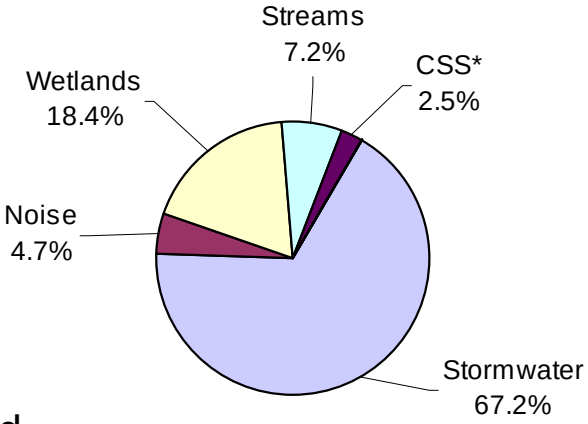


* For 2003 & 2006 studies, CSS costs were incorporated into other mitigation categories as applicable.

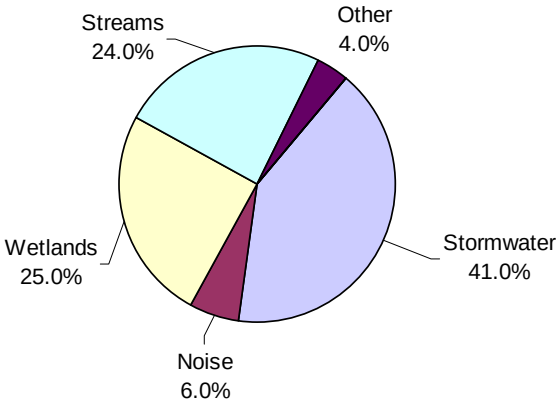
Case Study Comparison

(Mitigation Costs Only)

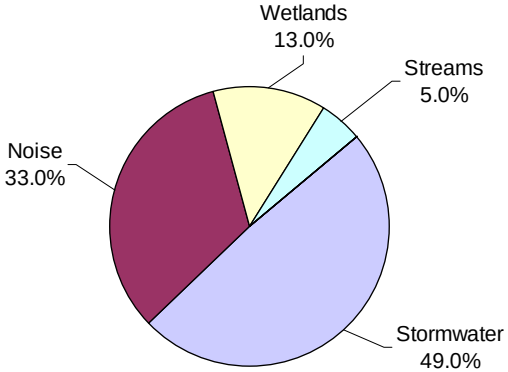
2009 case studies; balance of urban and rural projects



2003 case studies; balance of urban and rural projects



2006 case studies; mostly urban mobility projects



* For 2003 & 2006 studies, CSS costs were incorporated into other mitigation categories as applicable.

Observations and Conclusions

As expected, the total percent of the project cost spent on mitigation varies greatly with the project type, location and existing built and natural environments.

One of the interesting findings from this study is how much temporary mitigation efforts contribute to the overall cost, for stormwater in particular. Temporary mitigation primarily pertains to stormwater management during construction, although there are other mitigation categories that include temporary items such as temporary walls to prevent a stream impact. If you break out the temporary mitigation it accounts for 4.4% of the total project costs spent on mitigation and accounts for 40% of the total stormwater mitigation costs.

When you compare all three studies, stormwater mitigation consistently has the highest level of investment by a fairly wide margin. In 2003 stormwater accounted for over 40% of the mitigation costs. In 2006, it was nearly 50% and for this study it accounts for nearly 70%. When you look at stormwater costs with respect to percent of the total project costs for each study year we see a similar result. Stormwater costs were 7.8%, 8.4% and 10.7% of the total project costs for the 2003, 2006 and 2009 studies respectively. These results are somewhat inconclusive due to the variability that comes from the projects selected for evaluation. However, in comparing the range of percentages spent on stormwater it also shows an increase between study years 2003 and 2009. These two study years used a similar approach in project selection. 2006 shows a reduced range comapared to 2003 and 2009 which is primarily due to the projects selected for the 2006 study. The larger and more urban type projects tend to have a lower percentage of the total project cost spent on mitigation. This is believed to be associated with the higher costs for construction in urban areas. Based on these results, a general conclusion may be made that stormwater costs have increased over time. Some of these cost increases may be attributed to the changing requirements for stormwater management.

Observations and Conclusions

A majority of the projects in this study followed the 2006 Highway Run-off Manual (HRM) requirements. An update was issued in June 2008 with some additional requirements such as basing the flow control modeling on historic land cover conditions in Western Washington. Another example was the emergence of lower statewide threshold triggers for requiring dissolved metals water quality treatment. In anticipation of the update and due to timing, several of the projects in the study followed the methodology as described in the 2008 HRM. This is one of the primary drivers for increased costs in stormwater management.

Besides stormwater, the other mitigation categories showed no clear trend or pattern from the 3 studies conducted. This is believed to be related to the inherent variability of a given project type and location, as well as the limited number of projects that included a particular type of mitigation. Drawing firm conclusions is difficult because the sample size for each of the studies is small in relation to the total number of projects the agency delivers.

The general consensus with all three studies conducted is that projects west of the Cascades typically have higher levels of mitigation and related costs. As shown in the cross-state comparison, the range of percent spent on mitigation is significantly higher on the west side. The primary drivers for the higher costs are the projects' proximity to streams, wetlands, neighborhoods and a higher general cost for construction services and real estate.

The right-of-way costs associated with mitigation for this study accounted for $7 million. If you include the purchase of wetland bank credits it is nearly $8 million. Right-of-way costs associated with mitigation can be a significant cost to a project. Where there were opportunities, the project teams implemented unique and creative solutions in order to reduce these costs. A couple of examples of this are the integration of stormwater treatment facilities within interchange ramp areas or elongated facilities within roadside ditches that have minimal or no impact to real estate. In one project, wetland bank credits were used from a previous related project to compensate for their projects impacts. Considering that the total amount spent on mitigation for this study is over $105 million, the associated right-of-way costs are a relatively minor portion of that total investment.

Appendix-Environmental Review and Permit List

	ENVIRONMENTAL REVIEW										ENVIRONMENTAL PERMITS												
	NEPA Document (EIS, EA, DCE, CE)	SEPA Document	Noise Assesment Study	Air Quality Conformity Determination - Clean Air Act	National Historic Preservation Act, Section 106 Concurrence from DAHP	Executive Order O5-05 - Condurrence from DAHP	FHWA Review/Approval on Section 4(f): Wildlife Refuges, Recreation Areas,	**NOAA Consultation - ESA Impact	***USFW Consultation - ESA Impact	Tribal Consultation/Approval	Hydraulic Project Approval (WDFW)	Army Corps Clean Water Act Section 404 Permit	USACE Section 10 Permit - Navigable Waters	Coast Guard Section 9 Permit - Bridges over certain navigable waters	Local Agency Growth Management Act/Critical Area Ordinance Review	Local Agency Shoreline Approval (Shoreline Management Act)	Clean Water Act Section 401 Water Quality Certification	Clean Water Act Section 402 - NPDES Construction Stormwater Permit	Clean Water Act Section 402 - NPDES Municipal Stormwater Permit	Coastal Zone Management Consistency Determination (Ecology)	Dept. of Natural Resources - Aquatic Lands Use Authorization	Local Agency Noise Variance / Exemption	Percent Mitigation
Project Case Study																							
SR 16 Burley Olalla		x			x			x	x		x	x					x	x	x				19.1%
I-5/SR 16 WBNV	x		x		x					x		x			x			x	x	x		x	9.1%
I-5 Grand Mound	x	x			x			x	x	x	x	x			x	x	x	x	x	x			19.9%
US 290 Starr Rd.	x	x			x				x										x				4.6%
SR 270 Pullman to Idaho	x	x			x		x		x	x	x	x			x		x	x	x				11.4%
SR 24 - SR 241 Cold Crk.	x	x			x			x	x										x				6.4%
US 12 Frenchtown	x		x	x	x			x	x	x	x	x			x	x	x	x	x				4.6%
SR 539 Ten Mile Rd.	x	x	x		x		x	x	x	x	x	x			x	x	x	x	x		x	x	23.7%
SR 522 UW/Cascadia CC	x		x					x	x	x	x	x			x	x	x	x	x	x	x	x	11.2%
SR 518 SeaTac Airport	x	x	x	x	x					x	x	x					x		x			x	34.6%
I-5/SR 502 I/C	x	x	x	x	x		x	x	x	x	x	x			x	x	x	x	x				22.6%
SR 500/I-205 I/C	x	x			x					x		x			x		x	x					12.4%
US 2/97 Peshastin I/C	x	x	x		x			x	x	x		x						x	x				17.4%
US 2/97 Wenatchee Trail	x	x			x				x	x					x	x		x	x				7.3%

***Clean Water Act**

***National Pollutant Discharge Elimination System**

**** National Oceanic and Atmospheric Administration-Fisheries**

*****United States Fish and Wildlife Service**

Why do we mitigate for stormwater?

Increases in paved surfaces from roadway construction generate stormwater discharges that can contribute to changes in stream flow, stream temperature, water quality and aquifer recharge, because the pavement prevents infiltration into the ground and the highway runoff conveys pollutants from the roadway into the environment. Additionally, storm events during construction can cause erosion and degraded water quality. WSDOT's stormwater mitigation activities are aimed at minimizing the effects of new impervious surfaces and erosion and sedimentation on construction sites.

Laws and regulations that govern actions affecting stormwater include:

Federal Permits and Review

The Clean Water Act, Section 402, regulates discharges of stormwater. This section, it's implementing regulations, and permits issued thereunder, is the biggest driver of stormwater mitigation for WSDOT. Stormwater that flows from WSDOT construction sites (one acre or larger) into river systems and wetlands is strictly regulated for erosion control under the National Pollution Discharge Elimination System (NPDES) general permit for construction activities. This permit requires best management practices for erosion control on construction projects. WSDOT also mitigates stormwater discharges from new and existing impervious surfaces under another NPDES permit – the municipal stormwater permit issued to WSDOT in November 2008. Implementation of Section 402 has been delegated by the U.S. Environmental Protection Agency to the Washington State Department of Ecology. The Ecology-issued NPDES permits require use of the *Highway Runoff Manual* for mitigating construction and post-construction discharges from WSDOT sites and facilities.

The Endangered Species Act (ESA) was passed to protect and ensure the long-term viability of avian, terrestrial, aquatic, and marine species of flora and fauna. The United States Fish and Wildlife Service (USFWS) is tasked with managing avian, terrestrial, and aquatic species, while the National Oceanic and Atmospheric Administration Fisheries Service (NOAA) is tasked with managing marine species. The listed species most notable to WSDOT with respect to stormwater are bull trout and salmon. Every project with a federal nexus (funding, permit, etc.) proposed by the department must be reviewed for compliance with the ESA. Stormwater impacts to water bodies that function as habitat for ESA species is one of the effects considered in an ESA review, which is referred to in the law as a "consultation". Some projects must complete a Biological Assessment and enter into informal or formal consultation with the Services (one or both depending upon the species potentially affected by the project). Projects in the consultation process must receive concurrence in the form of a concurrence letter for an informal consultation or a Biological Opinion for a formal consultation, prior to construction. The Endangered Species Act *does not require* a project to mitigate for impacts nor prescribe a specific method of mitigation; however, if a finding of jeopardy is made for a species, or a finding of adverse modification is made for critical habitat, the project may not move forward.

Why do we mitigate for stormwater? (Continued)

The Clean Water Act, Section 401, certifies that discharges of fill, dredged and other material into waters of the state will not violate state water quality standards, when the discharge is regulated by a Section 10 or 404 permit issued the United States Army Corps of Engineers. If stormwater impacts occur to waters of the state through a 404 permitted activity, and the impact is not regulated by a Section 402 permit (see above), the Department of Ecology is required to certify that the project will be in compliance with the state aquatic protection laws through issuance of the §401 Water Quality Certification. Under an Executive Order, the Governor has delegated authority for Section 401 to the Washington State Department of Ecology.

The National Environmental Policy Act (NEPA) applies to all projects that either receive federal funding or are required to obtain federal permits. Potential impacts and mitigation strategies are identified through Environmental Impact Statements (EIS), Environmental Assessments (EA), or a Documented Categorical Exclusion (DCE). NEPA documents are developed in conjunction with a federal lead agency, typically the Federal Highway Administration, for WSDOT's transportation projects. Compliance with NPDES stormwater permits and use of the Highway Runoff Manual is generally presumed to meet NEPA requirements for mitigation of environmental impacts from stormwater.

State Permits and Review

The State Environmental Policy Act (SEPA) requires review of potential impacts to stormwater and identification of mitigation opportunities. WSDOT is the lead agency for its projects under SEPA. All agencies with expertise are expected to review documents created by the lead agency. The SEPA administrative code is adopted and updated by the Department of Ecology. Compliance with NPDES stormwater permits and use of the Highway Runoff Manual is generally presumed to meet SEPA requirements for mitigation of environmental impacts from stormwater.

The State's Water Pollution Control Act (Chapter 90.48 RCW) Requires the use of all known, available and reasonable methods of prevention, control and treatment to prevent the pollution of Washington State's waters. Requires waste discharge permits prior to discharging waste materials into waters of the state and requires the Washington State Department of Ecology to investigate proposed discharges to determine whether the discharge will pollute state waters in violation state policy. Authorizes the Washington State Department of Ecology to assume delegation of the federal National Pollutant Discharge Elimination System (NPDES) permit program. Ecology's NPDES permits address the requirements of both the state Water Pollution Control Act and the federal Clean Water Act.

Hydraulic Project Approvals. Chapter 77.55 RCW governs construction projects in state waters and requires the department to get a Hydraulic Project Approval (HPA) from the Department of Fish and Wildlife (WDFW) for all work in state waters. The purpose of this permit is to ensure that the state's aquatic species are not unduly harmed. For stormwater, HPAs regulate only the construction of stormwater facilities below the

Why do we mitigate for stormwater? (Continued)

Ordinary High Water Level of state waters, not the type of BMP nor the quality or quantity of the stormwater discharge.

Local Permits and Review

In most instances, local stormwater management standards will not override the requirements in the *Highway Runoff Manual*. The Revise Code of Washington (RCW) 47.01.260(1) grants WSDOT plenary power in planning, locating, designing, constructing, improving, repairing, operating, and maintaining state highways, including drainage facilities and channel changes necessary for the protection of such highways. This grant of authority means that, absent express legislative direction, WSDOT is not subject to local regulations in areas within WSDOT's purview. The following are major local/area specific requirements that WSDOT will comply with where applicable.

The State Shoreline Management Act (Chapter 90.58 RCW) requires local governments to develop "shoreline master programs" that regulate development in shoreline areas adjacent to rivers and larger streams, lakes larger than 20 acres, and marine waterfronts. These local programs include both plans and regulations for achieving the level of protection of shorelines based on state guidelines, but tailored to meet specific community needs. The plans are a comprehensive vision of how shoreline areas will be used and developed over time. Regulations are the standards that shoreline projects and uses must meet. WSDOT’s compliance with SMA rules and the conditions of local shoreline master programs is achieved during the project planning and design phase and through submittal of the required permit applications. Typically, compliance with the Highway Runoff Manual will address concerns relative to stormwater in shoreline areas.

The State Growth Management Act Critical Area Regulations (Chapter 36.78 RCW and Chapter 365-195 WAC) requires all local governments to adopt and enforce *critical areas ordinances* and, more recently, to meld these with SMA requirements. Critical areas ordinances are a set of development regulations that protect wetlands, stream corridors, fish and wildlife habitat, potable water groundwater recharge areas, flood plains, and geologic hazard areas. If a project is located within a designated critical area, WSDOT’s compliance with critical area ordinances is achieved during the project planning and design phase through submittal of the required permit applications and negotiations in project design and mitigation measures. Typically, compliance with the Highway Runoff Manual will address concerns relative to stormwater in critical areas.

Tribal Governments Review

Federal treaties between Sovereign Tribal Nations and the federal government require WSDOT to maintain government-to-government relations with 29 federally recognized tribes. This covers cultural, environmental, and economic rights of the tribe related to aquatic species and habitat.

Why do we mitigate for noise impacts?

Construction and traffic noise is a nuisance to both humans and wildlife. Noise can affect human sleeping habits and outdoor recreation. Breeding, foraging, and nesting habits in wildlife can be impacted by construction noise. Local ordinances aim to diminish the effect of short-term construction noise, while the Federal Highway Administration regulates traffic noise.

Laws and regulations that govern actions affecting noise include:

Local Permits and Review

Local ordinances that govern noise are limited to nighttime construction activities and vary greatly from jurisdiction to jurisdiction. These ordinances may prohibit certain activities such as pile driving or jack-hammering during certain hours of the day. WSDOT often receives variances from these ordinances. Local governments do not regulate chronic traffic noise and daytime construction activities are exempt.

State Permits and Review

The State Environmental Policy Act (SEPA) requires that all major actions sponsored, funded, permitted, or approved by state and/or local agencies undergo planning to ensure environmental considerations are given due weight in decision-making. SEPA documents identify potential impacts due to noise as well as abatement opportunities. WSDOT is the lead agency for its projects under SEPA. All agencies with expertise are expected to review documents created by the lead agency. The SEPA administrative code is adopted and updated by the Department of Ecology.

WSDOT Department directive D22-22 and the Priority Study (1985) outline the criteria for conducting a noise inventory for existing state highways and establishment of noise priority sites for traffic noise abatement.

Federal Permits and Review

The National Environmental Policy Act (NEPA) applies to all projects that either receive federal funding or are required to obtain federal permits. Potential impacts and mitigation strategies are identified through Environmental Impact Statements (EIS), Environmental Assessments (EA), or a Documented Categorical Exclusion (DCE). NEPA documents are developed in conjunction with a federal lead agency, typically the Federal Highway Administration, for WSDOT's transportation projects.

FHWA Noise Standards, *Procedures for Abatement of Highway Traffic Noise and Construction Noise*, require a traffic noise analysis for federally funded projects that 1) involve construction of a new highway, 2) significantly change the horizontal or vertical alignment, or 3) increase the number of through traffic lanes on an existing highway. When federal funds are used in project construction, FHWA noise abatement standards must be met. When state, county or city only funds are used WSDOT noise policy standards must be met.

Why do we mitigate for noise impacts? (Continued)

The Endangered Species Act was passed to protect and ensure the long-term viability of avian, terrestrial, aquatic, and marine species of flora and fauna. Highway construction operation can have harmful effects on listed species, including interruption of foraging, breeding, and nesting activities. Each project that receives federal funding must undergo ESA review. Some projects must prepare a Biological Assessment and enter into formal or informal consultation with the services. Projects which have entered formal consultation must obtain a Biological Opinion while projects which have entered informal consultation must obtain a concurrence letter. In both cases, concurrence must be obtained prior to construction. The Endangered Species Act does not require a project to mitigate for impacts; however, if a finding of jeopardy is made for a species or a finding of adverse modification is made for critical habitat, the project may not move forward.

Why do we mitigate for wetland impacts?

Wetlands perform a broad variety of critical functions for our ecological systems, including improving water quality, stabilizing stream flows, providing storage for flood waters, providing rearing areas for juvenile salmon, creating rest stops for migratory waterfowl, and providing essential forage, breeding, and nesting areas for a host of species.

Laws and regulations that govern actions affecting wetlands habitats include:

Local Permits and Review

The Revise Code of Washington (RCW) 47.01.260(1) grants WSDOT plenary power in planning, locating, designing, constructing, improving, repairing, operating, and maintaining state highways, including drainage facilities and channel changes necessary for the protection of such highways. This grant of authority means that, absent express legislative direction, WSDOT is not subject to local regulations in areas within WSDOT's purview. The following are major local/area specific requirements that WSDOT will comply with where applicable.

The State Shoreline Management Act (Chapter 90.58 RCW) tasks local governments with establishing shorelines of statewide significance and with creating overall development plans for all shorelines. The Shoreline Management Act explicitly includes wetlands associated with regulated shorelines. Any WSDOT project that impacts a wetland that is associated with a regulated shoreline is then subject to regulation under the Shoreline Management Act. Each county is empowered to enforce elements of the Shoreline Management Act.

The State Growth Management Act (Chapter 36.78 RCW and Chapter 365-195 WAC), combined with Article 11 of the Washington State Constitution, mandates that local jurisdictions adopt ordinances that classify, designate, and regulate land use in order to protect critical areas. Critical areas include, wetlands and their buffers, among others. These areas are regulated through local critical/sensitive areas ordinances. WSDOT must gain local government approval under the Growth Management Act whenever wetlands are impacted. Requirements of these ordinances vary widely from jurisdiction to jurisdiction.

State Permits and Review

The State Environmental Policy Act (SEPA) requires that all major actions sponsored, funded, permitted, or approved by state and/or local agencies undergo planning to ensure environmental considerations, such as impacts on wetlands, are given due weight in decision-making.

WSDOT is the lead agency for its projects under SEPA. Potential impacts and mitigation strategies are identified in the SEPA documents. All agencies with expertise are expected to review documents created by the lead agency. The SEPA administrative code is adopted and updated by the Department of Ecology.

The State Water Pollution Control Act (Chapter 90.48 RCW) is the primary water pollution law protecting state waters, including wetlands. The State's Water Quality Standards, 173-201(A) WAC, specifically require that the beneficial uses of wetlands be protected. The Department of Ecology has authority under the Act to issue administrative orders to protect waters of the state not covered by federal laws, such as isolated wetlands. The Department of Ecology is mandated to enforce compliance with the State Water Pollution Control Act and require mitigation for wetland impacts in order to replace lost functions of the permitted impacts.

Why do we mitigate for wetland impacts? (continued)

Hydraulic Project Approvals. The Hydraulic Code, Chapter 77.55 RCW, governs construction projects in state waters and requires WSDOT to get a Hydraulic Project Approval (HPA) from the Washington Department of Fish and Wildlife (WDFW) for all work in state waters, including wetlands that contain fish habitat. Chapter 220.110 WAC expands on this goal by including all work that may impact state waters. The purpose of this permit is to ensure that the state's aquatic species are not unduly harmed. WDFW issues Hydraulic Project Approvals .

Why do we mitigate for wetland impacts? (Continued)

Federal Permits and Review

The National Environmental Policy Act (NEPA) requires that all major actions sponsored, funded, permitted, or approved by federal agencies undergo planning to ensure that environmental considerations, such as impacts to wetlands, are given due weight in decision-making. Potential impacts and mitigation strategies are identified through Environmental Impact Statements (EIS), Environmental Assessments (EA), or a Documented Categorical Exclusion (DCE). NEPA documents are developed in conjunction with a federal lead agency, typically the Federal Highway Administration, for WSDOT's transportation projects.

The Endangered Species Act (ESA). The goals of ESA include species conservation, ecosystem conservation, and species recovery. Regulations pertaining to wetlands overlap with ESA requirements because wetlands can be habitat for federally listed plants and animals.

The Clean Water Act (33 USC § 1251 et seq.), formerly known as the Federal Water Pollution Control Act, provides comprehensive federal regulation for all sources of water pollution. It prohibits discharge of pollution from non-permitted sources.

Section 404 of the Act regulates the discharge of dredged or fill materials into waters of the United States, including wetlands. Section 404 is jointly administered by the U.S. Environmental Protection Agency and the U.S. Army Corps of Engineers (Corps). The Corps issues permits for activities that discharge dredge or fill materials to waters of the U.S., including wetlands. In order to obtain a Corps permit for a project that impacts wetlands, WSDOT identifies how it will avoid, minimize and/or compensate for any loss to wetland acreage or function.

Section 401 requires that federally permitted activities comply with the federal Clean Water Act, state water quality standards, and any other appropriate state laws (such as the Water Resources Act and Hydraulic Code). The Washington Department of Ecology implements Section 401 requirements and issues water quality certifications on projects that require a Corps' Section 404 Permit. When WSDOT needs a Section 401 water quality certification for a project that impacts wetlands, WSDOT identifies how it will avoid, minimize and/or compensate for any loss to wetland acreage or function.

The Rivers and Harbors Act (33 USC **§** 403) Section 10 of the Rivers and Harbors Act requires U.S. Army Corps of Engineers authorization for structures or work in, over or affecting navigable waters of the United States.

The Coastal Zone Management Act requires protection of coast natural resources such as shellfish and salmon, as well as broader ecological and geological functions of coastal areas. This act includes wetlands within Washington's 15 coastal counties. The Coastal Zone Management Act requires states that want to receive federal funding for coastal resource protection to develop a Coastal Zone Management Program. The National Oceanic and Atmospheric Administration Office of Ocean and Coastal Resource Management (OCRM) has approved the Washington State Department of Ecology's Program.

Why do we mitigate for wetland impacts? (Continued)

Tribal Governments Review. Federal treaties between Sovereign Tribal Nations and the federal government require WSDOT to maintain government-to-government relations with 29 federally recognized tribes. This covers cultural, environmental, and economic rights of the tribe related to aquatic species and habitat.

Why do we mitigate for wetland impacts? (Continued)

Executive Orders and Agency Directives

Protection of Wetlands, Presidential Executive Order 11990 requires federal agencies to minimize the loss or degradation of wetlands and enhance their natural value. WSDOT projects with federal funding are subject to this order.

Preservation of the Nation's Wetlands, U.S. Department of Transportation Order DOT 5660.1A describes U.S. Department of Transportation policy that transportation facilities and projects should be planned, constructed, and operated to assure the protection, preservation, and enhancement of the nation's wetlands to the fullest extent practicable. The order establishes procedures for implementation of this policy.

Protection of Wetlands, Governor's Executive Order 89-10 commits state agencies to no overall net loss to wetlands, and to the encouragement of sensitive site design and planning on a watershed basis to avoid or minimize damage to wetlands. The order designates the State Department of Ecology to provide guidance on wetland issues, and instructs each affected state agency to develop an action plan to lessen the loss of wetlands and to preserve or enhance the values of wetlands.

Protection of Wetlands, Governor's Executive Order 90-04 is more comprehensive than Executive Order 89-10, and requires all state agencies to rigorously enforce their existing authorities to assure wetlands protection. State agencies are required to promote and support mitigation in the order of decreasing preference from avoidance to compensatory mitigation.

Washington State Department of Transportation Directive D31-12, Protection of Wetlands Action Plan establishes policy and guidance for the protection and preservation of wetlands. The Directive was developed to ensure no overall net loss of wetlands is caused by department actions, and to increase the quantity and quality of wetlands in the long term.

Why do we mitigate for stream impacts?

Streams are vital to the environment, providing both critical habitat and a mechanism for conveyance of water. Impacts on one part of a stream may affect an entire watershed system. Consequently, maintaining the health of streams is essential to providing a healthy environment.

Laws and regulations that govern actions affecting riparian habitats include:

Local Permits and Review

The Revise Code of Washington (RCW) 47.01.260(1) grants WSDOT plenary power in planning, locating, designing, constructing, improving, repairing, operating, and maintaining state highways, including drainage facilities and channel changes necessary for the protection of such highways. This grant of authority means that, absent express legislative direction, WSDOT is not subject to local regulations in areas within WSDOT's purview. The following are major local/area specific requirements that WSDOT will comply with where applicable.

The Shoreline Management Act (Chapter 90.58 RCW) tasks local governments with establishing shorelines of statewide significance and with creating overall development plans for all shorelines. Whenever WSDOT has a construction project in a river, it is required to get a permit from the appropriate local jurisdiction to ensure that shoreline protection requirements are met and that the development is compatible with the local plan.

The State Growth Management Act (Chapter 36.78 RCW and Chapter 365-195 WAC) requires applicable local governments to establish Critical Area Ordinances for the protection of critical habitats and species. Many riparian areas are included in local Critical Area Ordinances.

State Permits and Review

Hydraulic Project Approvals. Chapter 77.55 RCW governs construction projects in state waters and requires the department to get a Hydraulic Project Approval (HPA) from the Department of Fish and Wildlife for all work in state waters. Chapter 220.110 WAC expands on this goal by including all work that may impact state waters. The purpose of this permit is to ensure that the state’s aquatic species are not unduly harmed. In order to obtain an HPA from WDFW on a project that uses, diverts, obstructs, or changes the natural flow or bed of any of the salt or fresh waters of state, WSDOT identifies how it will avoid, minimize and/or compensate for those impacts.

Federal Permits and Review

The National Environmental Policy Act (NEPA) applies to all projects that either receive federal funding or are required to obtain federal permits. Potential impacts and mitigation strategies are identified through Environmental Impact Statements (EIS), Environmental Assessments (EA), or a Documented Categorical Exclusion (DCE). NEPA documents are developed in conjunction with a federal lead agency, typically the Federal Highway Administration, for WSDOT’s transportation projects.

Why do we mitigate for stream impacts? (Continued)

The Endangered Species Act (ESA). The goals of ESA include species conservation, ecosystem conservation, and species recovery. Regulations pertaining to streams overlap with ESA requirements because streams can be habitat for federally listed plants and animals.

The Clean Water Act, Section 401, regulates discharge into waters. If rivers are to be filled or discharge is made into a river, a permit is required under Section 401. Such a permit may require mitigation of impacts as part of the permit approval. Under an Executive Order, the Governor has delegated authority for Section 401 to the Washington State Department of Ecology.

The Clean Water Act, Section 402, regulates discharge of stormwater. Stormwater that flows from WSDOT construction sites into river systems is strictly regulated for erosion control under a National Pollution Discharge Elimination System permit. This permit establishes best management practices for erosion control on construction projects. Enforcement of Section 402 has been delegated by the Environmental Protection Agency to the Washington State Department of Ecology.

The Clean Water Act, Section 404, regulates dredging and fill in waters, including rivers. Section 404 permits are granted through the United States Army Corps of Engineers.

The Rivers and Harbors Act, Section 10, regulates all navigable waters. Permit approvals must be secured to ensure no obstructions to navigable waters occur. This is applicable to many WSDOT bridge construction activities. Section 10 permits are granted through the United States Army Corps of Engineers.

The Coastal Zone Management Act requires protection of coast natural resources such as shellfish and salmon, as well as broader ecological and geological functions of coastal areas. The Coastal Zone Management Act requires states that want to receive federal funding for coastal resource protection to develop a Coastal Zone Management Program. The National Oceanic and Atmospheric Administration Office of Ocean and Coastal Resource Management (OCRM) has approved the Washington State Department of Ecology's Program.

Tribal Governments Review. Federal treaties between Sovereign Tribal Nations and the federal government require WSDOT to maintain government-to-government relations with 29 federally recognized tribes. This covers cultural, environmental, and economic rights of the tribe related to aquatic species and habitat.