

Traffic Operations Low Cost Enhancement 2009-2011 Biennium

End of Biennium Report

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September 2012



**Washington State
Department of Transportation**

INTRODUCTION

For the 2009-2011 biennium, the legislature provided WSDOT with \$2.4 million in Motor Vehicle Account proviso funding for statewide prioritized Low Cost Enhancement (LCE) projects administered by WSDOT's Traffic Operations Program:

2009-11 Budget Bill Proviso Language:

“\$2,400,000 of the motor vehicle account--state appropriation is provided solely for low-cost enhancements. The department shall give priority to low-cost enhancement projects that improve safety or provide congestion relief.

The department shall prioritize low-cost enhancement projects on a statewide rather than a regional basis.

By September 1st of each even-numbered year, the department shall provide a report to the legislature listing all low-cost enhancement projects prioritized on a statewide rather than regional basis completed in the prior year.”

LCEs are defined as small, low cost projects that can be implemented quickly to improve operational safety or reduce congestion on the highway system. LCE projects generally target problem areas identified in the priority programming process, by constituents, or elected officials. LCE's allow officials to quickly respond to emerging roadway safety issues.

This report highlights some of the LCE projects of statewide significance, selected and completed by WSDOT's Traffic HQ and regional offices during the period July 1, 2009, through June 30, 2011.

LCE funding is divided into two categories:

1. \$2.4 million is prioritized by proviso to fund major projects of statewide significance costing up to \$100,000. This money is administered by HQ Traffic Operations, but projects are implemented in each region. An example of a project in this category is an installation of several miles of rumble strip on appropriate roadways.
2. The amount of \$4.4 million is distributed to each region for minor LCE projects costing between \$5,000 and \$50,000. An example of a regional LCE project is an individual or series of directional signs installed along a roadway.

Primary types of LCE projects include:

- Traffic control signing improvements;
- Roadway striping, rumble strip installation or other road marking improvements;
- Installation or improvement of traffic signals or other electronic devices;
- Roadway access control through channelization or lane reconfiguration.

**Regional Low Cost Enhancement Projects
2009-2011 Biennium
July 1, 2009-June 30, 2011**

Summary of Regional Projects

Region	Minor LCE Projects*	Major LCE Projects	Total Expenditures
Northwest	71	16	\$3,501,948
Olympic	52	9	1,169,796
Southwest	36	9	936,108
South Central	30	7	469,982
North Central	45	12	784,836
Eastern	25	1	456,989
HQ	1		41,630
Grand Total**	260	54	\$7,361,289

*Total number of projects may be greater because of small projects being grouped together

**In the 2009-11 Biennium, the Low Cost Enhancement Program was funded by two Legislative Appropriations: \$2.4 million was restricted by specific proviso language and the balance was funded from a regular state appropriation.

The following table lists all major LCE projects completed during the 2009-11 Biennium, using the \$2.4 million proviso funding administered by the HQ Traffic Office. Following the list of projects are descriptions of some of the projects in each region.

Major Project Listings by Region

Region	Project	Expenditure
NW	Wrong Way Prevention enhancements – Multiple locations	\$132,479
NW	I-90 WB @ MP 26.24 VMS – Replacements/Upgrades	140,677
NW	SR 522 Kenmore to Bothell – Barrier Installation	101,993
NW	SR 20 @ Carter – Restripe	86,148
NW	SR 18 @ MP 17.4 – VMS Upgrade Installation	66,483
NW	SR 530 @ Smokey Point – Intersection Improvements	62,877
NW	I-90 EB @ MP 24.5- VMS Installation	56,009
NW	I-5 Southcenter Vicinity – Guardrail Treatment	45,059
NW	SR 516 E. Military & 74 th – Rumble Strip Installation	47,719
NW	SR 204 Sunnyside 9 th /10 St. – Safety Improvements	42,532
NW	SR 410 @ 244 th – Illumination Upgrades	21,704
NW	SR 18 @ MP 20.4 – Camera Installation	17,581
NW	SR 548 @ Vista-Birch Bay Jct. – Rumble Strip Installation	22,478
NW	SR 542 @ Mitchell Rd. – Two Way Left Turn Lane Installation	8,285
NW	SR 20 @ Ball Street, Sedro Woolley – Safety Improvements	20,915
NW	SR 9 @ 4 th St. SE MP 15.05 – Access Control Improvements	13,699
	NW Region Total	\$886,638
OLY	Wavetronix Funding – Install electric sensors	\$58,438
OLY	SR 101 @ Morse Creek – Channelization & Recessed Edge line	56,166
OLY	Region wide Data Station Installation	55,241
OLY	SR 101 @ Jorsted Creek Bridge to Brockdale – C/L Rumble Strip	54,178
OLY	Winslow Way Signal Improvement	25,000
OLY	SR 167/SR 512 – Install 24 Hour Tow-Away Signs	24,459
OLY	SR 101 – Wrong Way Prevention Enhancements	21,724
OLY	DUI Charges	\$1,689
OLY	Safety Corridor Projects	1,096
	Olympic Region Total	\$297,991
SW	SR 14 @ MP 6-12 vic. – Enhancements for ATIS	\$82,776
SW	SR 432 – Install Concrete Barrier	74,249
SW	SR 14 @ MP 57.8-77.4 – Tunnel Signing Enhancements	73,533
SW	Project Cost Agreement	47,392
SW	I-5 – MMA Striping Refresh	43,234
SW	I-5 MMA Striping Agreement	35,678
SW	US 12 White Pass & US 97 Satus Pass – Camera Replacement	29,318
SW	I-5 @ 78 th St. – Interchange Right Turn Signal Improvements	28,200
SW	SR 14 @ 164 th & I-205 @ SR 14 – Skid Resistant Surface Treatment	20,685
	Southwest Region Total	\$435,065
NC	Project Cost Agreement	\$86,104
NC	LCE Program Management	2,515
NC	US 2 @ MP 199.8-206.5 – Install Safety Bars	67,105

NC	SR 26 @ Jct SR 243 – Install Warning Beacons	51,898
NC	SR 171 & Western, Moses Lake – Pedestrian Safety Project	46,153
NC	SR 283 @ MP 9.35-10.15 – Slope Flattening Safety Project	45,590
NC	SR 243@ MP 17.7-18.5 - Schawana Curves Flashing Beacons	31,363
NC	SR 283 @ MP 5.96 – Install Illumination System	42,917
NC	Region wide – Implement MUTCD Signing Compliance	27,101
NC	Region wide – Transverse Rumble Strip Installation	21,722
NC	Transverse Rumble Strip Pilot Project	4,368
NC	SR 28 – Restripe roadway between Ephrata and Soap Lake	13,693
	North Central Region Total	\$440,529
SC	SR 240 @ MP 33-33.16 Swift Cemetery – Right Turn Pockets	\$114,544
SC	SR 240 @ MP 40.48 Edison St. – Install Ramp Signal	52,317
SC	US 12 Old Naches – Install Over speed Detection	40,950
SC	SR 241& I-90 Exit 109 – Install Flashing Beacons	20,283
SC	US 395 @ Kennewick – Flashing Yellow Signing	15,000
SC	US 395 & SR 82 – Striping & Signing	12,293
SC	LCE Program Management	2,577
	South Central Region Total	\$257,964
EA	US 195 MP 92.82-94.32 Cheney Spokane Road - Traffic Safety Corridor Improvements	\$ 50,581
	Eastern Region Total	\$ 50,581
HQ	LCE Program Management & Support of Regional Safety Corridor Projects	\$ 41,630
	Total HQ Projects	\$41,630
	Grand Total	\$2,410,398

Highlights

MAJOR LOW COST ENHANCEMENT PROJECTS FUNDED BY \$2.4 MILLION PROVISO

NORTHWEST REGION

Project Title **Access Restriction**
Location **SR 204 @ Sunnyside Blvd & 9th/10th St SE**

Background/Statement of Need

This project implemented improvements at Sunnyside Blvd and 9th/10th Streets, two non-signalized intersections located ½ mile apart on SR 204 near Lake Stevens. This is a high speed corridor and both intersections have a history of multiple angle collisions with 70% of crashes related to left turning movements. Both intersections are located within well documented High Accident Corridors (HACs). The speed limit along this corridor is 55 mph, but speed studies show an 85th percentile speed of 65 mph.

Solution

Engineering to enhance protection for left turns from the intersections onto the highway was deemed the best solution for improving this intersection. Traffic engineers expect a reduction in accidents by eliminating the highest-risk turning movements to and from both the Sunnyside Blvd and 9th/10th Street SE intersections. Modifications included using median islands, curbing, and regulatory signing. Ongoing performance measurement at these sites will gauge the success of these projects.



SR 204 & Sunnyside Before, During & After Implementation



SR 204 & 9th/10th Street Before, During & After Implementation

Project Benefits

The turn restrictions will increase safety at conflict points through this high speed corridor. Additionally, a left turn refuge area is now available on SR 204 for motorists making a left turn onto the highway from 9th Street. The refuge simplifies the left turn by requiring only a gap in westbound traffic.

Project Timeline & Status

- Started September 2009
- Completed April 2011

Financial Information

- Budget \$30,000
- Final Cost \$42,532

Project Title **Intersection Improvement**
Location **SR 530 @ Smokey Point Blvd**

Background/Statement of Need

The intersection on SR 530 known as the Smokey Point Wye is actually a complex of three intersections spaced 400 feet apart. The east and west junctions of the Wye connect to Smokey Point Blvd leading south as a primary arterial into the City of Arlington. The intersection of 27th Ave NE lies between the east and west junction and leads north from SR 530 to serve farms and a private park.

Before this project, the Wye complex had no dedicated left turn lanes, and had a high crash history for vehicles stopped to make left turns leaving and entering SR 530. Although both the east and west junctions met volume requirements for making a left turn lane, and the 27th Ave NE intersection had a pronounced pattern of eastbound rear-end crashes on SR 530 of traffic turning left onto 27th Ave NE. Many of the crashes involved slow moving recreational and farm vehicles.

Solution

This project replaced the existing two-lane highway with a continuous three-lane layout that provides left turn storage at all three intersections. At the east junction the center lane became a one-way westbound left turn lane, while at the west junction, the center lane became a left turn refuge for the northbound left turn onto SR 530. This transformed turning left into a two-step process that is a much safer option, especially during peak traffic periods. At the 27th Ave NE intersection, the center lane now serves as both left turn storage for traffic arriving from the west, and as a refuge for those turning left to travel east.

Implementation of this project was accomplished by restriping existing pavement and performing minor widening on the south side to gain adequate shoulder widths.

Project Site



Smokey Point Wye and 27th Ave NE

Project Benefits

This project enhanced safety for drivers traveling in this corridor and reduced the occurrence of rear-end collisions.

Project Timeline

- Started December 2009
- Completed October 2010

Financial Information

- Budget \$70,000
- Final Cost \$62,877

Project Title **Wrong Way Prevention Modifications**
Location **Multiple Locations**

Background/Statement of Need

The issue of wrong-way collisions has been of growing concern to WSDOT, WSP, and the general public. Consequently, reducing the number of wrong-way movement crashes at freeway off-ramps has become a strong focus of WSDOT and WSP. This biennium, two important tools were used to help mitigate wrong way crashes: data analysis and Geographic Information Systems (GIS) mapping tools. They were used to help identify high occurrence locations of wrong-way incidents, and high probability locations for the occurrence of wrong-way errors.

Solution

This project applied two solutions for wrong-way preventive actions:

1. Comprehensively analyzed functions at ten select interchanges, including signing, channelization, and signal displays. Most solutions involved using channelization: widening and reshaping median islands; installing curbing to block error-paths; relocating stop bars, and adding yellow guide radius striping. The average cost for these solutions was \$10,000 per location.
2. Upgraded the signing at twelve additional interchanges to strengthen deterrence for wrong-way drivers. Signs were upgraded to meet current size and placement standards. The cost per site ranged from \$500-\$15,000.

Project Site



Examples of Wrong Way Prevention Modifications: Signing, Island Installation and Striping Guideline

Project Benefits

This project provided a systematic way to mitigate interchanges with the greatest potential for wrong-way errors. Using GIS analysis, ten sites were selected for modifications, and twelve for signing upgrades. Locations included SR 516 at SR 18, SR 509 at Des Moines Memorial Drive, SR 167 at S 277th, I-5 at 320th, I-405 at NE 8th, I-5 Truck Scales at MP 141, SR 529 at SR 528, I-405 at SR 181, I-5 and SR 516, I90 Eastgate Direct Access, and US 2 at Bickford.

Project Timeline

- Started September 2009
- Completed March 2011

Financial Information

- Budget \$123,000
 - Final Cost \$132,479
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Project Title **Two-Way Left Turn Lane (TWLTL) Extension**
Location **SR 20 @ Ball Street**

Background/Statement of Need

The intersection of SR 20 and Ball Street sits at the western end of a commercial area in the City of Sedro-Woolley, and was identified as a High Accident Location (HAL) corridor in 2006. There were no left turn lanes and collisions averaged about ten per year, 80% of which were rear-end collisions. The highway east of Ball Street has three lanes with a center turn lane to serve left turns at driveways and intersections, but that transitioned to a two lane configuration at Ball Street. Because of the close proximity of the commercial area, the city wanted to bring continuity to the corridor and increase safety at this intersection by extending the three lane highway west to include Ball Street.

Solution

This project extends the three lane highway west to include Ball Street adding it to the existing two way left turn lane corridor. The new lane configuration provides Ball Street a center turn lane where vehicles traveling in both directions can be protected when turning left to leave the highway. It also acts as a refuge for vehicles turning left into the highway. The new lane arrangement laterally shifts thru lanes onto existing shoulders (which were wide enough to accommodate 3.5 foot shoulders). Minor widening was added to Ball Street to provide adequate radius for turning onto the highway.

Coincidentally, the City of Sedro-Woolley had independently identified the same needs at this intersection that were outlined in the 2009 LCE project application. Consequently, and unbeknownst to WSDOT, the city applied and received a separate grant to build a three lane section through the intersection, as well as add bike lanes and sidewalks. The \$20,000 LCE that that WSDOT would have provided for a simple restriping project was instead used as a match for a grant the city obtained to provide a more robust project that included a turn lane, sidewalk, and bike lane.

Project Site



Ball Street Intersection with SR 20, Sedro Woolley

Project Benefits

This project improves safety for left turning vehicles at SR 20 and Ball Street and will lower the occurrence of rear-end collisions.

Project Timeline

- Started January 2010
- Completed June 2011

Financial Information

- Budget \$20,000
- Final Cost \$ 20,915

Project Title **Rumble Strip Installation**
Location **SR 548 – Vista Drive to Birch Bay Junction**

Background/Statement of Need

SR 548 is a rural two-lane highway with a posted speed limit of 55mph and a history of Run-Off-The-Road (ROTR) collisions. From 2004-2005 there were five ROTR collisions; from 2006 to 2008 there were ten ROTR collisions including one with serious injuries. From January to April 2009 there were four ROTR collisions.

Solution

Traffic engineers determined that installing ground-in rumble strips on the roadway shoulders to deter drifting vehicles would be the best solution.

Project Site



Project Benefits

This solution uses methods published in the Highway Safety Manual for ROTR deterrence and reducing risk and severity of injuries suffered in collisions on rural multi-lane highways. The site will be measured for ongoing performance of this solution.

Project Timeline

- Started January 2010
- Completed May 2011

Financial Information

- Budget \$49,300
- Final Cost \$22,478

Project Title **Barrier Installations**
Location **SR 522 – Kenmore to Bothell**

Background/Statement of Need

In May, 2008 the Chief of the Northshore Fire Department in Kenmore contacted WSDOT regarding a fatality ROTR incident that occurred on SR 522 between Kenmore and the Bothell City Limits. A vehicle rolled down the roadway side slope and landed next to the Burke-Gilman Trail. The Chief voiced his concern about the high risk of ROTRs along this segment of roadway, and requested that WSDOT install guardrail as mitigation. Although Traffic Engineers had concerns about their ability to construct this project due to steep slopes and the proximity of underground and overhead utilities, they were able to implement a solution that satisfied the Chief’s concerns.

Solution

WSDOT installed Type 31 beam guardrail, and terminal and guide posts along the eastbound right shoulder of SR 522 from MP 8.22 to MP 8.58.



Project Site - SR 522 before Guard Rail Installation



Project Site – SR 522 after Guard Rail Installation

Project Benefits

This project eliminated ROTR accidents along this area of SR 522 adjacent to the Burke-Gilman Trail, greatly increasing the safety of trail users and reducing societal cost.

Project Timeline

- Started September 2009
- Completed July 2010

Financial Information

- Budget \$125,000
- Final Cost \$101,993

Project Title **Replace/Upgrade Variable Message Sign (VMS)**
Location **I-90 Westbound @ Milepost 26.24 (SR 18)**

Background/Statement of Need

Maintenance personnel requested upgrading this VMS sign because of its importance in communicating road conditions and closures on SR 18 during winter weather events. At elevation 1377, Tiger Mountain summit on SR 18 is prone to adverse weather conditions. Although the old sign on WB I-90 was less than fifteen years old, it was functionally obsolete, difficult to see, and too small by current standards to adequately convey advanced roadway conditions. There were frequent constituent complaints. Furthermore, this interchange has increased in importance since Maintenance uses it to detour traffic and/or restrict truck traffic when needed.

Solution

The best solution was to upgrade the existing VMS sign westbound on I-90 at MP 26.24 in advance of SR 18 and Tiger Summit to a sign with advanced communication capabilities.

Project Site



Project Benefits

The new VMS uses state-of-the-art ITS equipment to give immediate warning to motorists about adverse winter road conditions, as well as road closures and delays due to incidents occurring in non-winter months. Additionally, the new VMS sign will provide traveler information about using SR 18 as a bypass route for Seattle area traffic (especially truck traffic) destined to southwest Washington from eastern Washington via I-90/ I-5.

Project Timeline

- Started November 2009
- Completed June 2011

Financial Information

- Budget \$100,000
 - Final Cost \$140,677
-

Project Title **New Variable Message Sign Installation**
Location **I-90 Eastbound @ Milepost 24.5**

Background/Statement of Need

This sign was requested by the NW Region Traffic Operations office. High volume local traffic generators in the vicinity of I-90 at MP 24.5 (Exit 27) often resulted in off-ramp traffic backups eastbound on I-90 in the vicinity of Exit 25 and Exit 27.

I-90 over Snoqualmie Pass is the busy primary route between eastern and western Washington. With elevation near 3,000 feet, it routinely experiences adverse weather conditions during the winter months. This makes providing current road conditions and weather information at the pass a critical function. There are also a high number of constituent requests to improve travel information in the Snoqualmie Pass vicinity.

Solution

The solution was to install a new state-of-the-art VMS sign eastbound on I-90 at MP 24.3. This VMS fills the need to improve travel advisories near Exits 25, 27 and beyond.

Project Site



Project Benefits

The new VMS enhances traveler information, improves roadway safety and reduces roadway congestion during adverse conditions.

Project Timeline

- Started November 2009
- Completed June 2011

Financial Information

- Budget \$100,000
- Final Cost \$ 56,009

Project Title **New Variable Message Sign Installation**
Location **SR 18 Eastbound @ Milepost 17.40**

Background/Statement of Need

This is a new sign requested by Maintenance personnel who are often called out to close portions of SR 18 at the 1,377' elevation at Tiger Summit during winter weather events. Maintenance uses this route to detour traffic to alternate routes and/or restrict truck traffic. There were also constituent requests for installing this sign.

Solution

The solution was to install a new VMS sign Eastbound in advance of Tiger Summit. The sign now provides reliable and current real time information to aid in driver decisions regarding pass conditions. This sign also supports the system of VMS signs and cameras impacting SR 18, giving comprehensive coverage about advanced roadway conditions on SR 18's Tiger Mountain summit.

Project Site



Project Benefits

This VMS is a part of the system that uses state-of-the-art ITS equipment in this area to warn motorists of impending adverse winter road conditions, road closures or delays due to incidents occurring during non-winter months. Additionally, the VMS will relay crucial traveler information regarding SR 18 as a bypass route for traffic from eastern Washington (especially truck traffic) destined to southwest Washington via I-90 and I-5.

Project Timeline

- Started November 2009
- Completed June 2011

Financial Information

- Budget \$100,000
- Completed \$ 66,483

Project Title: New Camera Installation
Location: SR 18 Eastbound @ Milepost 20.40

Background/Statement of Need

This is another new camera requested by Maintenance personnel who are often called out to close portions of SR 18 during winter weather events. The roadway elevation at Tiger Summit is 1377 feet, making it prone to adverse weather conditions during the winter months. Also, the SR 18/I-90 junction has increased importance because Maintenance uses this route to detour traffic when restricting truck traffic on I-90. There were also substantial constituent requests to install this camera.

Solution

The best solution was to install one camera in the median west of the Issaquah-Hobart Rd overcrossing.

Project Site





Project Benefits

Providing timely road conditions and travel information via reliable equipment to both commercial and non-commercial highway users is crucial in this location. The camera will help the agency alert motorists to impending winter road conditions on SR 18, and road closures and delays due to other incidents that occur in non winter months. Additionally, traveler information on SR 18 is crucial for I-90 traffic (especially truck

traffic) bypassing the Seattle urban area. SR 18 also serves as a bypass for I-90 traffic connecting from southwestern Washington to eastern Washington via I-5 and I-90.

Project Timeline

- Started November 2009
- Completed June 2011

Financial Information

- Budget \$100,000
- Final Cost \$ 17,581

Project Title: Rumble Strip Installation
Location: SR 516 East of Military Road to 74th Ave S Vicinity

Background/Statement of Need

This segment of SR 516 from Military Road east to the vicinity of 74th Avenue South is a multi-lane highway in a semi-urban area with a posted speed limit of 55mph and shoulders four feet or greater on semi-tangent sections. The site had been identified as a High Accident Area (HAC) with 32 ROTR collisions occurring from 2006-2008 with one serious injury. Although previous improvements for intersection signing, channelization and signal revisions were made, a high number of ROTR collisions kept occurring.

Solution

This solution to improve safety at this site was to add a ground in should rumble strip to deter vehicles from erring the roadway.

Project Site

516 Inc 2009: SRMP 3.92 / ARM 3.91



Project Benefits

This project will mitigate the run-off the road risk, reducing the severity of injury collisions that do occur.

Project Timeline

- Started March 2010
- Completed May 2011

Financial Information

- Budget \$25,000
 - Final Cost: \$47,719
-

Project Title: Safety Improvements
Location: SR 542 Mt. Baker Highway- Mitchell Road MP 13.26

Background/Statement of Need

Mitchell Road is a Whatcom County road that connects the Mount Baker School District's high school, junior high and administrative offices to State Route 542 - the Mount Baker Highway. The accident history between January 1, 2006, and December 31, 2010, showed nine collisions involving 15 vehicles, most of which were rear-end crashes involving drivers turning into/out of Mitchell Road. These collisions resulted in six injuries and one fatality. The fatality, which occurred in early November, 2010, killed well known Mt. Baker high school student Kourtney Cadle on her way to a school sponsored event. Community concern over Kourtney's death engendered the broad support that WSDOT needed to implement a quick solution using LCE funding.

Solution

The region worked closely with the Mount Baker School District, the County and the local community (including Kourtney's parents) to make safety improvements before the beginning of the 2011 school year. To reduce collisions the region: restriped the highway to include a 1,000-foot long two-way-left-turn lane; extended the 45 mph speed zone just west of Mitchell Road (which moved the intersection into the 45 mph zone from the 55 mph zone) and installed transverse rumble strips across the highway at the start of the 45 mph zone to alert drivers to the reduction in the speed limit.

Project Site



SR 542 & Mitchell Road before improvements



SR 542 & Mitchell Road after improvements (Looking East)

Project Benefits

There is insufficient data to measure the success of this project since its completion, but WSDOT will continue to monitor collision data and report on any improvements when known. Further, WSDOT will add speed studies to assess if and how the rumble strips are impacting driver speeds.

Project Timeline

- Started November, 2010
- Completed May, 2011

Financial Information

- Budget: \$8,300
- Final Cost: \$8,285

Project Title **Access Control Improvements**
Location **SR 9 & 4th Street SE MP 15.05**

Background/Statement of Need

With a history of at-angle, multiple injury collisions, the SR 9 intersection with 4th Street SE near Snohomish was identified in 2008 as a Collision Analysis Location (CAL). The speed limit along this section of SR 9 is 55 mph and this intersection with 4th Street SE is the only break in a 1.5 mile long limited access corridor located between the signalized intersections of Market Place and 20th St SE.

Solution

This project implemented access control improvements at SR 9 & 4th Street SE to increase safety for all vehicles. In the new configuration, the west leg of the intersection was restricted to allow only right turns in and right turns out, freeing up the median space to be used as a refuge for westbound left turns from 4th Street. Drivers can now make westbound left turns in two stages, making the process less demanding. Eastbound left turns from 4th Street have been redirected to the safer alternative at the signalized Market Place intersection to the north. The original striping was revised and signing and curb/median islands were installed to physically prohibit the disallowed turning movements.

Project Site

SR 9 & 4th Street SE



Before

After

Project Benefits

In a two year period before the project (8/30/2007 – 8/30/2009), there were 12 collisions including 1 fatality, 3 evident injuries, and 3 possible injuries. All of these collisions were related to turning movements. For about the same time period after the project was completed (8/30/2009 – 6/30/2011), there have only been 2 collisions, both non-injury.

Project Timeline & Status

- Started January 2009
- Completed August 2009

Financial Information

- Budget \$10,000
- Final Cost \$13,69

Olympic Region

Project Title SR 512, SR 167 and SR 410
Portland to King County Line
Flow Map Improvements

Location SR 512, MP 3.53 to MP 12.04
SR 167, MP 5.99 to MP 10.94
SR 410, MP 8.84 to MP 11.79

Background/Statement of Need

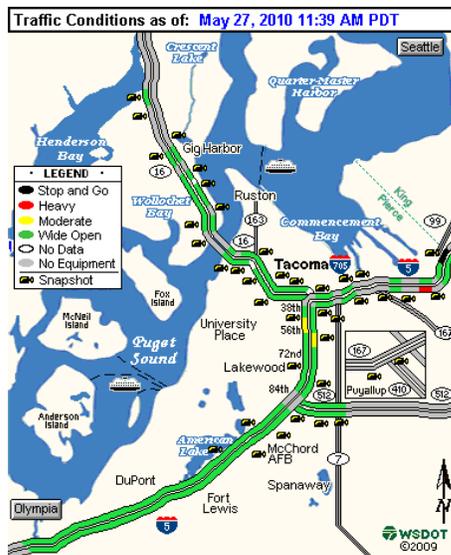
SR512, SR167, and SR410 are the major alternate routes to and from Seattle in the event of freeway incidents, construction, or maintenance activities along the Tacoma I-5 corridor. To effectively redirect traffic to alternate routes, the Traffic Management Center (TMC) needs to be able to monitor real-time traffic conditions on these routes.

Solution

This project enhanced traffic movement in these corridors by adding a series of data stations to provide real-time traveler/traffic information.

Project Site

Below is the existing flow map for the Tacoma area. The gray area on SR 512 will gain data as a result of this project. A new flow map has been developed to show all of SR 512, SR 167 to the King County line and SR 410 through Sumner.





Side Fire Radio Wave Data Station

Project Benefits

This project improves the ability of regional TMC operators to assess real-time conditions on SR 512/SR 167/SR 410 routes and better manage traffic flow during recurring and non-recurring congestion in the Tacoma area. The proposed data stations provide up-to-date information to travelers and other agencies.

Project Timeline

- Started October 2010
- Completed February 2011

Financial Information

- Budget \$120,000
- Final Cost \$ 55,241

Project Title 24-Hour No Parking Tow Away Zone
Location SR 167/512

Background/Statement of Need

The WSP requested and received approval to extend the “NO PARKING TOW AWAY ZONE” on both SR 167 and SR 512. The WSP wanted to strengthen the state’s ability to remove vehicles abandoned on the shoulder to help eliminate conflict with errant vehicles traveling the SR 16 and the SR 512 mainlines.

Solution Extend “NO PARKING TOW AWAY ZONE” signing on SR 512 from the Steele Street interchange to the SR 167 Interchange and on SR 167 from the Meridian interchange to the Pierce-King County line.

Project Site



New Tow-Away Zone Sign

Project Benefits

This project reduced the occurrence of conflict between abandoned vehicles parked on the roadway shoulder and errant vehicles straying from the mainline.

Project Timeline

- Started November 2009
- Completed November 2009

Financial Information

- Budget \$33,000
 - Final Cost \$24,459
-

Project Title: Centerline Rumble Strip
Location: SR 101- Jorsted Creek Bridge to Brockdale Road
Vicinity (MP 321.71 to MP 341.27)

Background/Statement of Need

This segment of US 101 is a rural, two lane highway traversing rolling terrain through several small communities. It is a winding road that skirts the Hood Canal with several areas of back-to-back horizontal curves containing a significant area of narrow (two to four feet) shoulders. The speed limit along this segment of highway varies from 30 mph to 55 mph. Although variable, the dominating roadside features consist of deep fill slopes on the west side, (with only some slopes protected by guardrail) while the east or water side of the roadway is mainly steep cut banks. These conditions contribute to a high occurrence of crossing centerline fatal and serious injury collisions along the roadway.

Solution

This project constructed ground in centerline rumble strips throughout the project limits, with the exception of areas that have a speed limit less than 35 mph (Hoodsport and Lilliwaup).

Project Site



Project Benefits

Data shows that installing centerline rumble strips significantly reduces crossing centerline crashes and their corresponding fatal and serious injuries.

Project Timeline

- Started May 2010
- Completed May 2010

Financial Information

- Budget \$100,000
- Final Cost \$ 54,178

SOUTHWEST REGION

Project Title I-5 & 78th Street Interchange - Right-Turn Signals
Location I-5/78th Street Interchange in MP 5.41 Vicinity

Background/Statement of Need

The interchange at I-5 and 78th Street is an urban interchange with right-turn movements at the ramp terminals controlled by stop signs. Rear end collisions occurred frequently with right-turning traffic because of the stop-and-go nature of this movement.

Solution Implementation

The best solution at this site was to install right-turn signal displays. This reduced the potential for rear-end collisions by giving the right-turn movement a dedicated amount of right-of-way time to complete the turn without having to stop and look for a gap.

I-5/78th Street Interchange: Before



I-5/78th Street Interchange: After

Project Benefits

This solution made movement at the right turn more predictable, thereby reducing the frequency and severity of rear-end collisions.

Project Timeline

- Started January 2010
- Completed June 2010

Financial Information

- Budget \$40,000
 - Final cost \$28,200
-

Project Title **Application of Skid Resistant Surface Treatment to Ramps**
Location **SR 14 & 164th & SR 14 & I-205**

Background/Statement of Need

These freeway ramps experienced a high occurrence of wet weather accidents over a period of three years (27 accidents in which 20 occurred on wet pavement). The majority of accidents were single vehicle ROTR accidents occurring in the curve sections, in close proximity to one another. These ramps had also been identified as a HAL in the last two biennia. Earlier attempts to mitigate the accidents with chevrons and oversized large arrows proved unsuccessful.

Solution

The pavement was treated with a skid resistant surfacing product that increased the friction and braking ability of vehicles. The product is composed of an epoxy resin binder with bauxite, which maintains its durability and sharp edges far greater than other aggregates. This results in lasting high skid resistance in both wet and dry weather. The SR 14 ramp was treated with the product for a length of about 500 feet, while the I-205 ramp was treated in two locations for a total of about 700 feet.

Project Site



Project Benefits

While this technique is relatively new in the US, the Federal Highway Administration (FHWA) has reported a reduction in wet pavement accidents of up to 50% using this product. The treatment gives the roadway more friction, adding skid resistance which decreases lane departures. The region is conducting before and after studies at the site, which when completed, will determine suitability of the product to other sites.

Project Timeline

- Started March 2010
- Completed September 2010

Financial Information

- Budget \$60,000
 - Final cost \$20,685
-

Project Title **Tunnel Safety Project**
Location **SR 14, MP 38.86 to MP 84.62**

Background/Statement of Need

The SR 14 tunnels have had a continuing high occurrence of collisions and evident vehicle damage inside the tunnels. This became an important concern of WSDOT Area 4 Maintenance, the WSP, and Education Service District 112. In addition to the collision concerns, SWR Traffic was mandated to maintain and upgrade the bicycle warning signals at the tunnel approaches. These are solar-powered signals installed on an old (1994) contract. The single most problematic tunnel is #5 due to short sight lines.

Solution

SWR Traffic decided to replace the old signals on the Tunnel #5 approaches with new state-of-the-art VMS signs. In addition to replacing the old bicycle warning system, the new VMS signs have internal radar that displays speed warnings to oncoming vehicles. The installations are solar powered with wireless communication. When a bicyclist activates a sign at one approach, the warning automatically activates on the other approach. The warnings stay activated for two minutes and over rides the vehicle speed warning.

In addition to the electronic installations, advance warning of the tunnels was revised and expanded for vehicles approaching the Bridge of the Gods and The Dalles Bridge, citing I-84 in Oregon as an alternate route.

Project Site



Before

After

Project Benefits

This project enhances safety for both motor vehicles and bicycles traveling the SR 14 tunnels by providing an active warning system, advanced notification and updates of tunnel hazards, and identification of alternate routes.

Project Timeline

- Started January 2010
- Completed June 2011

Financial Information

- Budget \$70,000
- Final Cost \$73,533

Project title **SR 14 Advanced Traveler Information Systems (ATIS)
Incident Management Enhancement**
Location **MP 6 – MP 12 Vic.**

Background/Statement of Need

The section of SR 14 from the vicinity of MP 6 to MP 12 currently has no ITS infrastructure. There is a compelling need because this area has become a highly traveled commuter route connecting the Vancouver Metro area with Portland via the I-205 Glenn Jackson Bridge. There is a pending project funded by Congestion Mitigation and Air Quality (CMAQ) Program that will provide fiber optic, a microwave wireless communication system, traffic cameras, data stations, and a VMS for traveler information. Data from this project will be shared with regional partners via the bi-state metropolitan ATIS website. However, due to lack of funding, a gap existed for access and interface to the ITS/ATIS. This project fills the gap in the CMAQ funding.

Solution

This solution closes a short term gap between WSDOT’s communication system and the City of Vancouver regarding fiber optic cable available for WSDOT use via the Vancouver Area Smart Trek partnership agreement. It provides an additional high level of traffic management and surveillance cameras along with an associated redundant communication fiber optic path to access an existing shared City of Vancouver fiber optic cable just beyond the 192nd Ave interchange.

Project Benefits

The project helps provide robust travel information to motorists using this congested area.

Project Timeline

- Started June 2010
- Completed October 2010

Financial

- Budget \$75,000
- Final Cost \$82,776

NORTH CENTRAL REGION

Project Title **Pedestrian Safety Project**
Location **SR 171**

Background/Statement of Need

Crossing SR171 in Moses Lake was difficult for pedestrians and bicycles due to a relatively high speed limit of 40 MPH combined with long crossing distance of 70 feet. An eleven year collision history shows six pedestrian collisions on this two mile section of SR171. Three of the collisions resulted in fatalities, with two of the fatalities in the last four years occurring near the Burress Avenue crossing.

Solution

The solution was to provide high visibility crossings by constructing a pedestrian activated flashing beacon systems and illumination at two locations, Burress Avenue and South Western Avenue. Due to the extensive length of the crossings, designers constructed refuge islands in the two way left turn lane and placed signs and beacons in the median to make them more visible.

Project Sites



Before Mid Block Crossing at SR 171 & Burress Project



Improved Mid Block Crossing at SR 171 & Burress



Before Mid Block Crossing at SR 171 & Western Project



Improved Mid Block Crossings at SR 171 & Western

Project Benefits

This project improved safety by increasing driver awareness of pedestrians and their intent to cross, and by giving pedestrians a refuge island in the middle of the crossing.

Project Timeline

- Started September 2009
- Completed July 2010

Financial Information

- Budget \$134,655
- Q Funding Amount \$ 46,153

Project Title **Schawana Curves – Signing/Flashing Beacons**
Location **SR 243 MP 17.7 – 18.5**

Background/Statement of Need

The roadway curves located between Schawana and Mattawa on SR 243 are constricted between basalt cliffs on the east and the Columbia River on the west. Roadway shoulders are narrow and there is no room to widen them. The collision history in the curve area included ROTR trucks breaching the guardrail, and landing in the river. A five year collision history (January 2004 – December 2008) indicated four collisions in the curve area, including two single vehicle collisions, two multiple, and one fatal collision occurring in February 2004.

Solution

Traffic engineers decided that adding chevrons and solar powered flashing beacons at the beginning of the curves would significantly improve safety at this location.

Project Site



SR 243 Southbound MP 17.90



SR 243 Northbound MP 18.41

Project Benefits

This project will decrease ROTR accidents by improving the effectiveness of warning signs in the curve area.

Project Timeline

- Started December 2009
- Completed October 2010

Financial Information

- Budget \$29,160
 - Final Cost \$31,363
-

Project Title: Intersection Warning Sign & Beacon
Location: SR 26 @ SR 243

Background/Statement of Need

Eastbound SR 26 begins at the junction of I-90 at the east end of the I-90 Vantage Bridge. All eastbound traffic on SR26 at this point has exited I-90 where the speed is 70 mph. Although the speed limit on SR 26 drops to 60 mph it is likely that much of the eastbound traffic has not adjusted to the lower speed limit because of the close proximity to I-90. One mile after leaving I-90, SR26 intersects SR 243 while traveling downhill and around a left-hand curve, making traffic turning left onto SR 26 from SR 243 vulnerable to speeding eastbound traffic from I-90.

A three year collision history (January 2006 – December 2008) shows a total of five collisions: four were at-angle; one was overturned; three were injury collisions, and one was a fatality. Three of the five collisions were traveling eastbound.

Solution

Traffic engineers determined it was critical to warn traffic leaving I-90 to slow down. To do this they installed a side road symbol sign with a flashing beacon on SR 26, to warn eastbound traffic of the approaching SR 243 junction. The flashing beacon begins flashing as north bound traffic on SR 243 approaches the stop sign and remains flashing while vehicles are stopped at the stop bar waiting to enter SR 26.

Project Site



SR 26 Eastbound MP 0.94



SR 26 Westbound MP 1.08

Project Benefits

By raising the awareness of eastbound motorists on SR 26 that traffic on SR 243 will be turning onto SR 26, traffic engineers project a reduction in the number and severity of collisions. Results will be monitored for safety improvement in the intersection.

Project Timeline

- Started December 2009
- Completed October 2010

Financial Information

- Budget \$43,000
- Final Cost \$51,898

Project Title SR 283, Slope Flattening Safety Project
Locations SR 283, MP 9.35 to 9.82 Right Turn Borrow Area
SR 283, MP 9.93 Left Turn to 10.2 Left Turn
MP 9.93 Right Turn to MP 10.15 Right Turn

Background/Statement of Need

Existing roadway section in this area has 2:1 slopes with a average fill height of 12.5 feet on the left side of SR 283 and 8.0 feet average on the right side causing a site safety issue. Consequently, WSDOT Maintenance requested this area be slope flattened. This area was also identified at the 2010 Chip Seal Endorsement meeting.

A five year analysis of collision data at this location (January 2004 through January 2009) indicates one injury accident occurring where the vehicle went over the embankment.

Solution

The embankment was excavated with material to construct 4:1 slopes @ MP 9.93 to 10.16 Left Turn & MP 9.93 to MP 10.16 Right Turn.

Project Site:



SR 283, MP 9.35 Right Turn to MP 9.82 Right Turn- Borrow Section Before and During Construction - Looking North



SR 283, MP 9.35 Right Turn to MP 9.82 Right Turn Completed Back Slope Looking North



SR 283, MP 9.93 Left Turn to 10.16 Left Turn Completed Slope Flattening Looking South

Project Benefits:

Eliminate the need for guardrail, per the design manual.

Project Timeline:

- Started February 2011
- Completed April 2011*

Financial Information:

Original Budget: Q Funding	\$ 40,000
Total Funded From Q Funding	45,590
Added: Sate Force Work Construction Amount	\$ 65,100
Total Final Cost	\$110,690**

*Hydro seeding will be completed in fall of 2011

**Scope of Project expanded to complete both sides of SR 283

SOUTH CENTRAL REGION

Project Title **Swift Cemetery Right Turn Pockets**
Location **SR 240**

Background/Statement of Need

This section of SR 240 is called the “Richland Bypass.” The highway is a six lane, 55 mph, signalized corridor that is used daily by commuters who work on the United States Department of Energy (USDOE) Hanford Site. When drivers want to turn right at Swift Cemetery Road, they must drastically slow down to make the turn. This impedes the through drivers and creates a speed differential which is a cause for concern. Also, when thru traffic is stopped for the signal, right-turning traffic cannot get by to make a right turn on red, reducing the efficiency of the signal.

Solution

A simple solution was to install a standard right-turn pocket with the appropriate deceleration length.

Project Site



Project Benefits

This project increased roadway safety and capacity by adding a right turn lane.

Project Timeline

- Started March 2011
- Completed June 2011

Financial Information

- Budget \$100,000
- Final Cost \$114,544

Project Title **Old Naches Hwy Over-Speed Detection & Flashing Sign**
Location **US 12 @ Old Naches Highway**

Background/Statement of Need

This is a 60 mph semi-urban expressway located near Yakima. It has a history of collisions, many involving trucks unable to stop for the changing signal. At one time an interchange was proposed as a permanent solution, but a signal was installed as an interim measure. After the signal was installed, collisions continued and constituents requested that the region install a “prepare to stop when flashing” sign.

Solution

This will be a two part solution. Initially, the region will install the “prepare to stop when flashing” sign as requested. In addition, another solution will be tried on a trial basis. It involves emergent signal technology where traffic detectors identify heavy vehicles traveling in the “dilemma zone” approaching the signal and automatically extend the green time to allow them to clear the intersection.

Project Site

012 Inc 2009: SRMP 197.97 / ARM 197.66



Skid Marks on US 12 @ Old Naches Highway



New Warning Beacons on US 12/Old Naches Highway

Project Benefits

The flashing beacons will improve safety by reducing collisions at this high speed signalized intersection. Because of increased cost, it was decided that installation of detection for heavy truck and over speed algorithm implementation would be deferred to a future date.

Project Timeline

- Started April 2010
- Completed August 2010

Financial Information

- Budget \$30,000
- Final Cost \$40,950

Project Title **Flashing Yellow Arrow**
Location **US 395 @ Kennewick Ave. & Clearwater**

Background/Statement of Need

There are two signalized intersections on US 395 traveling through the City of Kennewick. Both have protected/permissive left-turn control that use a five display signal head. WSDOT and the City Traffic Engineer agreed that changing the signal displays to include the new “flashing yellow arrow” will greatly improve the efficiency of these signals.

Solution

Adding the flashing yellow arrow required removing the existing 5 section display and replacing it with a four section with arrows and a three section display for thru traffic. The signal controller and conflict monitor will be upgraded.

Project Site

Before



Project Benefits

This change will allow the signals at these two very busy intersections will increase safety and allow the signal to run more efficiently.

Project Timeline

- Started July 2010
- Completed June 2011

Financial Information

- Budget \$15,000
- Final Cost \$15,000

Project Title	I-90 Exit 109 Flashing Yellow Arrow and SR 241 Beacons
Location	I-90 Exit 109 WB Ramp Traffic Signal SR 241 Factory Rd, Edison Rd, and Sheller Rd

Background/Statement of Need

This project has two elements:

The westbound ramp terminus at I-90, Exit 109 in Ellensburg, had a crash history for vehicles turning left from southbound Main Street onto WB I-90. The existing traffic signal had a protected/permissive display, with some visual clutter caused by overhead guide signing. Relocating the signs would have required an expensive sign bridge structure that would likely exceed \$100,000.

On SR 241 near Sunnyside there is a crash history at the three intersections of Factory Rd, Edison Rd, and Sheller Rd. Most collisions are either a failure to stop or enter at angle. Adjusting stop bars, rumble strips on the side street, and larger stop signs had already been implemented in recent years.

Solution

On I-90, adding the flashing yellow arrow required removing the existing 5 section display and replacing it with a four section with arrows and a three section display for thru traffic. The signal controller and conflict monitor was be upgraded. A flashing yellow arrow now can be used to reduce enter at angle collisions, which was not possible with the existing display. Also, the flashing yellow arrow will provide more positive guidance to drivers to yield when turning, and be more visible with the clutter in the backdrop.

On SR 241, solar powered red flashing beacons will be installed to improve the conspicuity of the sign to reduce failure to stop collisions.

Project Site – I-90



SR 241

Project Benefits

On I-90, the change will allow the signal changes will increase safety and allow the signal to run with more flexibility.

On SR 241, the flashing beacons should reduce angle collisions at the intersection.

Project Timeline

- Started April 2011
- Completed June 2011

Financial Information

- Budget \$25,000
- Final Cost \$ 20,283

Project Title **SR 240 Edison Signal**
Location **SR 240 Exit 40 WB Ramp in Kennewick**

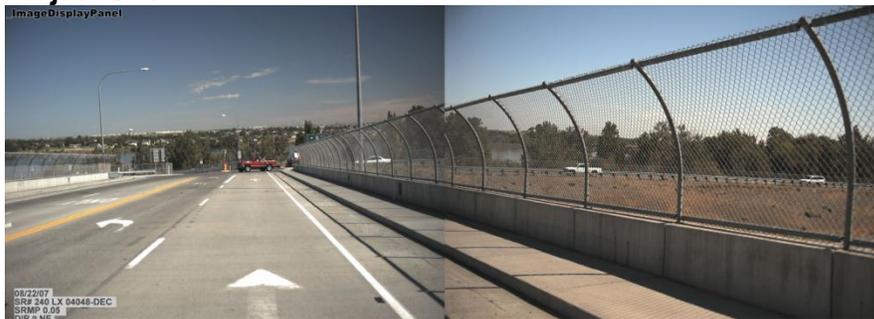
Background/Statement of Need

Approximately 14,000 vehicles use the Edison Street and SR 240 westbound ramp intersection every day and traffic consistently was backing onto the high speed lanes of westbound SR 240 during the evening, causing a number of collisions. An interim solution that could be quickly implemented was needed to give traffic engineers enough time to determine the best long term solution to the problem.

Solution

A timber spanwire signal was installed until a permanent solution can be programmed and funded. Costs related to preliminary engineering equipment purchase

Project Site



Project Benefits

This installation of a temporary traffic signal at this intersection will increase safety and reduce delays to the WB ramp traffic significantly. The traffic signal is temporary until a normal steel signal pole system or a roundabout can be designed and installed.

Project Timeline

- Started July 2010
- Completed November 2010

Financial Information

- Budget \$60,000
- Final Cost \$52,317

EASTERN REGION

Project Title: Cheney-Spokane Road Right Turn Lane/Corridor Safety Project
Location: SR 195 MP 92.82 – 94.32

Background/Statement of Need

This intersection has a history of collisions primarily related to drivers not waiting for a long enough gap to enter the highway. Ninety seven collisions were recorded from January of 1999 thru December of 2009, including one fatality in 2009. Eighty five of these collisions involved vehicles entering the roadway at-angle. In 70 of these collisions, a major contributing cause was not granting right-of-way to oncoming traffic. Given the high societal cost of collisions this became a high priority project.

Solution

The solution was to remove right turns from mainline by restoring old alignment for use as an exit ramp. This project used a portion of the cost overrun contingency funding left over from the US 195 Exit/Right Turn project to research potential Low Cost projects suggested by the Traffic Safety Corridor Team.

Project Site



Project Benefits

The safety benefit is the elimination of potential sight distance obstruction created by right turning vehicles. Removing the right turning volume reduces the number of vehicles passing through the intersection and improves gap-acceptance decisions made by side-street drivers. Before-after collision data analysis shows that offset right-turn lanes can be effective in reducing entering-at-angle collisions at High Speed At-Grade Intersections.

Project Timeline

- Started September 2009
- Completed December 2009

Financial Information

- Budget \$50,000
- Final Cost \$50,581

The following tables list LCE projects implemented with regional funding from the \$6.8 million proviso. Some projects were supplemented with unrestricted regional funding.

Northwest Region – Minor LCE Listings

LCE Design	270,932
Mats Lab Investigation	18,037
Tort Claim Investigation	3,534
Total for Multiple Small Cost Projects - Customer Response & Safety Enhancements	984,359
SR 99 @ 116th Controller Replacement	7,219
SR 9 @ 4th Street Access Management	13,700
SR 164th @ 180th Exit Left Pocket & Add Flasher	4,424
ST Tree in Service Evaluation Agreement	15,658
I-90 Exit 25 Sign Installation	16,547
SR 20 Spur Commercial Ave Inspection	20,032
SR 104 Edmonds Ferry Holding Lane	33,468
SR 900 @ Boeing Access Signal Integration	6,315
SR 18 @ Issaquah/Hobart & 256th Wrong Way Prev.	20,087
I-5 @ Military Rd Wrong Way Prevention	28,692
SR 522 @ SR 9 Wrong Way Prevention	13,071
SR 527 I/C Signals Central Ops Upgrade	3,984
SR 516 I/C Signals Central Ops Upgrade	7,295
SR 202 Vic SR 522 I/C Signals Central Ops Upgrade	4,591
I-5 Ramp Terminal Signals @ 188th St	25,217
I-90 North Bend Roundabout Signing	11,253
Snohomish PUD	478
I-5 Exit Signs to SR 599	11,467
CT Park & Ride Signs	6,315
I-5, I-405, US 2, SR 167 No Parking Signs	64,514
SR 523 @ 145th St Barrier Installation	10,351
I-5 @ 188th I/C Pedestrian Shoulder	2,702
Fiber Connection-Everett Signals	128
New Controllers @ I-405 @ SR 181	12,519
Verizon Conduit on Everett Bridges	16,026
I-5, SR 20, SR 530, Sauk-Suiattle Signs	30,986
SR 18 Tiger Mtn Summit – I-90 Traffic Data Collector	10,271
I-5 SB Exit 143 Sign & Stripe	8,245
SR 530 Install Solar Pavement Markers	17,143
UPS Installation @ Traffic Signals	5,726
I-5 North ITS Investigation	11,890
SR 169 @ 196th Ave SE Replace Controller & Cabinet	4,123
SR 202 @ 308th Restripe	10,308
I-90 Snoqualmie Pkwy @ SR 18 Re channelize	6,091
I-5 Exit 189 Ferry Signs	21,422
SR 525 Ferry Lane @ 5th Street I/S	8,655
SR 509 S Cloverdale Signal	835

Northwest Region – Continued

SR 20 – Anacortes Signing	7,287
US 2 Fryeland’s Flashing Beacon`	1,562
SR 525 Maxwellton Flashing Beacon	128
SR 525 Olympic View School Zone	5,964
US 2 Cameras, Interconnect, VMS	82,037
US 2 Old Cascade Highway Left Turn Pocket	20,841
SR 410 @ 244th Illumination	21,633
SR96 Penny Creek School Zone Relocation	8,057
SR99 SB @ 1st Ave Bridge Airport Signing	21,274
I-5 Pavement Marking Improvements	34,886
Button Crew Truck Mounted VMS	14,695
Thermoplastic Application Enhancement	26,718
I-5 @ SR 524 Sign	3,747
Relocate Surplus Gantry	5,522
Area 4 Impact Attenuator Upgrades	105,557
Southcenter vic. Guardrail End Treatments	75,684
I-90 Pedestrian Tunnel Lighting	21,790
Clear Camera View	28,408
Traffic Signal Modems	58,233
I-90 EB Exit to I-405 Sign Replacements	4,836
I-90 WB Eastgate Area Guide Signs	78,595
I-90 Eastgate SB to WB Fence Protection	4,675
SR 542 Mitchell Road – Two Way Left Turn Lane	8,285
RWIS Improvements – Equipment	137,264
I-5 Boeing Access Road Signing	6,676
I-5 @ 116th Street NE I/C Signing	14,875
I-5 @ s 320th Street Advance I/C Signing	4,310
SR 522 @ 47th Ave. NE – Barrier Installation	11,876
ATM Collision Data	1,285
TOTAL	\$2,615,310

North Central Region – Minor LCE Listings

Area 1 Signs	40,074
Area 2 Signs	10,463
Area 3 Signs	25,571
Area 4 Signs	12,903
Region wide Minor Striping/Channelization Modifications	14,544
Region wide Minor WSP Requested Enhancements	1,767
SR 28 MP 0.31 Valley Mall Parkway Signing	1,196
US 97A Install Chelan School Zone Signs & Beacon	2,012
I-90 @ Vantage Ethernet Upgrade	2,819
US 97 MP 217.6 Guardrail Extension	621
US 2 @ Saunders Rd I/C & /Follow thru Sign	717
US 97A Solar Beacons For Chelan School Zone	5,496
US 2 MP 85 Stevens Pass Closure Flip Signs	12,986
US 2 MP 100 Leavenworth Signal Comm & Cameras	12,934
US 2 MP 81.82 Nason Creek Rest Area Camera	13,945
SR 171 MP 0.76 Development for Pedestrian Crosswalks	1,474
US 2/SR 97 MP 136 Warning Signs for Left Turns	2,104
SR 17 MP 50-57 Install Back Up Power Equipment	4,324
US 2 MP 111.98 Bike Path Access @ Titcheneh Way	15,104
SR 285 MP 0.08 Sellar Cameras Comm Relocate & Upgrade	9,022
SR 283 @ County Road #5 NW- Slope Flattening Project	16,713
US 97 @ MP 331.72 – Oroville Left Turn Pocket Revision	4,855
US 2 @ MP 61&63 – Curve Warning Upgrades	3,354
US 2 @ MP 57-62 – Scenic SRA VMS Communication Link	14,013
SR 26 @ MP 40.66 – Othello Camera	7,771
US 2 @ MP 61.90 – Old Faithful Camera	5,626
SR 28 @ MP 51.77 County Rd 19 NW – Striping Revisions	1,306
Chelan Fruit Co-op – Pedestrian Crossing Partnership	2,204
Flashing Beacons for Warning Signs	12,242
SR 17 @ MP 53.91, Broadway – ML, Near Side Signal Head	72
Region Wide Intersection Warning Signs	8,089
US 2 @ MP 199-207 – Culvert Safety Bars	5,292
SR 243 @ MP 17.56-18.66 – Schwana Curves Advise Signs	6,741
SR 20 @ MP 220.9-221.9 – Loup Loup Chevrons	7,804
SR 283 – Slope Flattening Stage 2	19,186
SR 283 @ MP 4, Adams Rd. – Sight Triangle IMP	477
SR 172 @ MP 34.92, Simms Corner – Advance Beacon	415
SR 174 & SR 155 Jct. – Intersection Improvements	3,876
Region Wide Minor Durable Striping Improvements	13,005
US 2 @ MP 104-104.69 – RPMS	1,304
Region Wide Traffic Control Device Enhancements	5,896
I-90 Access Control Fencing	1,674
SR 153 @ MP 120-128 – Clear Zone Removal	2,614
US 2 /SR 97 – Recessed Pavement Markers	9,530
SF Work for Pavement markers	172
TOTAL	\$344,307

Olympic Region – Minor LCE Listings

Statewide Minor Enhancements	288,708
Region wide Sign Crew	189,432
QE Project Documentation (Julie)	68,267
WSP Aerial Surveillance Marker	9,678
Inigo Equipment	9,720
SR 12 Replacement Sign	2,288
SR 104 Kingston Study	27,218
I-5 Congestion Warning Sign	2,349
SR 101 @ SR 3 Left Turn Re-stripe	11,769
VMS Translator	43,813
SR 3 SB Off Ramp to Trigger	2,424
SR 3 SR & SR 16 Gorst Signs	2,227
Port Townsend Crosswalks	2,816
Little Valley Lane Revisions	8,034
SR 507 Deschutes Guardrail Extension	14,221
US 101 Holland & Orcas Dr Left Turn Pockets	96
TMC Server Replacement	7,320
SR 305 Reductions	1,774
I-5 Center Street MP 117.96	27,014
SR 16 MP 9.93 WB	2,848
SR 106 MP 0 to MP 20	4,874
SR 12 Speed Zone Sign Request	1,368
SR 510 @ SR 507 "Entering Yelm" Signs	2,157
Tacoma Museum District Signing	22,397
SR 303 Gore Line	1,766
SR 305 Day Road Signal Revision	3,832
SR 101 No Pass Strip Removal	1,225
I-5 Exit 107 @ Pacific Ave NB Off Ramp	1,748
US 101 SB Couplet Yield & Signing	2,073
Purdy Creek Stop Bars	2,617
NW Greaves Way Signing	3,213
I-5 MP 131.75 NB Off Ramp	1,742
SR 16 Speed Zone/Estimate	3,963
SR 305 @ Bond Rd	4,897
Center Drive Alternative	32,569
SR 104 MP 15.50 Vic.	7,146
SR 7 Alder Cut Off Rd	1,922
I-5 Fiber Optic Cable Installation	133
Signing for Discovery Bay RV Park	3,260
Twanoh State Park Pedestrian Sign Upgrade	1,601
SR 3/SR 308 Speed Zone Change Signing	1,928
SR 101 @ SR 8 Curve Warning Signing	1,527
Sargeant Blvd Signal Ahead Signing	3,282
SR 3 Gorst Vicinity	2,356
	23,996

Olympic Region – Continued

TMC Enhancements	
US 101 MP 331.64-331.94	2,708
US 302 MP 15.85-MP 16.09 -	1,831
US 101 @ I-5 Split & I-705 Panels	2,560
SR 302 – No Parking Signing	1,391
Sequim Bypass MIS Signing	2,596
SR 12 & Forstrom Stream Lighting	1,111
TOTAL	\$871,805

Southwest Region – Minor LCE Listings

State Work Force – 1 FTE	12,215
Completion of 07-09 LCE Projects	347
Warning Signs	38,233
Regulatory Signs	19,808
Recreational & Cultural Signs (Brown & White)	16,147
Informational/Guide Signing (Green & White)	44,279
Miscellaneous Other Signs	13,134
Regional Traffic Counts	204
Left Turn Channelization Projects	27,832
LCE Projects under \$5,000 per project	35,835
CAL/CAC Design	2,725
IR Equipment & Support	5,339
TMC Equipment & Support	14,237
Portable Traffic Video Recorder	7,685
Pavement Marking Enhancements	9,749
SR 12 Speed Study Vic Randle	9,444
SR 500 Lacamas Lake Bike/Ped Path	18,404
SR 502/503 Street Name Signing	3,048
SR 12 Speed Study Vic Mossyrock	6,402
SR 503 Median Curb \$16,000	8,499
SR 4 Pedestrian Crosswalk Enhancement	36,948
EOC Equipment & Support \$5,000	4,961
I-5 VMS Upgrade \$19,000	21,994
US 12 Lights on for Safety Signing	11,452
SR 503 Sea Wall Guardrail \$20,000	8,613
SR 500 Padden Parkway & 152nd I/S Improvements	7,112
Intersection Analysis Scoping	14,945
New IR Truck Equipment	24,826
Server for NG/TOCS	17,245
I-5 “C” Street Signing & Striping Enhancement	7,923
IAL WB SR 500 & 54th Ave. Signal Ahead Signing	8,040
CAL SR 503 & 87th Ave. Signal Modification	968
Automated Turning Movement Equipment	7,743
IAL I-205 Exit 32 SB Off Ramp Improvements	12,911
SR 14 Winter Road Closure Signing	6,489
SR 507 CAC 6th & Pearl Signing & Striping Enhancement	7,711
I-205 Exit 28 – Wrong Way Blinker Signs	7,596
TOTAL	\$501,043

South Central Region – Continued

State Work Force	2,982
Minor Signing Modifications	10,381
State Work Force	2,982
I-82 S1 01413 Ramp signing	859
I-82 EB Selah Creek Rest Area Off Ramp Signing	18,241
US 395 Upgrade Signal Control System	5,393
US 12 @ N 16th Ave I/C Stop Control	4,767
SR 397 Legislative Signing	17,251
SR 240 Richland Signing	3,069
I-90 VSL Signing	6,988
I-90 NW Region HAR Sign	2,208
US 395 Pedestrian Signal Adjustments	4,984
I-82 West Richland Signing	10,755
I-182 Speed Limit Signing	8,873
US 97 MP 50.9 Cattle Guard	7,251
SR 240 WB Edison Ramp Signal	20,103
US 12 “Turn on Headlights” Signs	3,325
SR 240 Beloit Rd Traffic Marking	1,617
I-182 @ WB 4th Ave On-Ramp Chevrons	617
I-82, P1 03096 Ramp Signing	2,834
I-90 Exit 47 Forest Service Signing	476
SR 12, 2nd Street Signal Pedestrian Enhancements	28,013
SR 24 Beaudry RR Pre-emption Enhancements	10,140
US 12 – Frenchtown Historic Site	4,004
SCR Roundabout Wrong Way Signing	6,998
US 395 – SB Portland Signing	5,699
Regional “Turn on Headlights” Signing	7,577
Regional S1-1 School Signing	4,350
US 395 @ Blue Bridge – Splatter Skip Line Striping	7,448
SR 24 @ SR 397 – Passing Zone Survey	1,833
TOTAL	\$212,018

Eastern Region – Minor LCE Projects

Customer Response Signing in Maintenance Area 1	33,155
Customer Response Signing in Maintenance Area 2	20,495
Customer Response Signing in Maintenance Area 3	15,779
Customer Response Signing in Maintenance Area 4	12,086
2009 Ramps SR View	7,820
US 195 - Colton School Flasher Sign Installation	5,489
SR 27 - Freeman School Flasher Signs	1,278
SR 20 - Colville High School Zone Flasher Revision	6,743
City of Spokane – Sensys	5,487
City of Cheney Pre-emption Systems	13,122
I-90 Ritzville Vicinity HAR Signing	29,148
US 2 Day –Mt. Spokane Road I/S Signal Phasing Mod.	10,998
US 2 & SR 206 – Lane Utilization Revisions	1,283
Regional School Signing	23,001
Regional CCTV	3,272
SR 904 – Cheney-Spokane & Betz Rd – Loop Detectors	5,336
SR 904 – Cheney- Spokane & Betz Rd Purchase & Service Loop Detectors	11,950
SGO – 1080	2,369
I-90 WB MP 225.41 - Power for HARS Signing	2,354
I-90 Ritzville Vicinity – Purchase and service HAR Signing	19,640
US 2 Day-Mt. Spokane Road I/S Loop Detection Purchase & Service	2,000
SR 21 – North Warning Signing Update	4,293
US 2 – Lawson Street Loop Detection – Phase 1	3,261
US 2 – Lawson Street Loop Detection – Phase 2	1,693
US 395 Hastings to NSC Fiber Interconnect	164,356
TOTAL	\$406,408