Washington State Department of Transportation

The Gray Notebook

GNB 31

WSDOT's quarterly performance report on transportation systems, programs and department management

Paula J. Hammond, P. E.
Secretary of Transportation

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In this edition

Annual Reports
Highway Congestion
Maintaining Storm-water Treatment Facilities
Intelligent Transport Systems
Air Quality & Noise

Quarterly Reports
Incident Response
Rail
Washington State Ferries
Capital Projects
Workforce Safety and Training

Executive Summary

An executive summary of articles in Edition 31 of the *Gray Notebook*

This edition of the Gray Notebook presents information on WSDOT's performance in the past quarter through September 30, as well as four annual reports. Highlights from this edition include:

- The Beige Pages present a quarterly report of WSDOT's ***capital project delivery performance***. As of September 30, 2008, WSDOT has delivered a total of 167 Nickel and Transportation Partnership Account (TPA) projects for $1.804 billion, on target with the legislative budget expectation. This includes 17 projects completed during the first quarter of FY 2009, which are described in detail on pp. 103-111. An additional 61 projects are currently under construction, with 43 projects due to be advertised for bid by March 31. 2009. (pp. 79-97)
- A new quarterly Stewardship feature – ***Completed Project Wrap-Ups*** – presents short summaries of the budget and schedule performance of all 17 Nickel- and TPA-funded projects completed within the quarter. (pp. 103-111)
- The 2007 ***Congestion Annual Update*** reports that increases in peak period travel times leveled off slightly in 2007 compared to 2005, and that nine key commute routes in the central Puget Sound saw improved travel times. The report also updates WSDOT's work on "Moving Washington"—the agency's three part strategy of adding capacity strategically, operating the system more efficiently, and managing demand. (pp.17-54)
- A special report on ***2008 Travel Trends*** reveals an overall decline in vehicle volumes, likely due to high gas prices in the first six months of the year. In addition, peak period travel times improved on six of seven corridors reviewed. (pp.12-16)
- The quarterly ***Worker Safety*** article highlights WSDOT's "Safety Stand Down" event, part of the agency's strategy for reducing the number and severity of employee injuries. WSDOT set a new target of 212 OSHA-recordable injuries and illnesses for FY 2009. (pp. 4)
- The annual feature on ***Maintaining Stormwater Treatment Facilities*** notes that a new stormwater permit is expected to be issued in fall 2008 that will require WSDOT to expand the geographic coverage of its program and perform additional inspections. Also, a new summary page in this section lists the Gray Notebook Preservation articles for the past and coming years. (pp. 6-8)
- The annual update on ***Noise Quality*** reports that WSDOT constructed five miles of new noise wall barriers since the last report in 2007, and that WSDOT now has two quiet pavement test sections: one at I-5 southbound near Lynwood, and a second on SR 520 near Medina. (pp. 72)
- This quarter's ***Rail*** article reports that ridership on state-supported Amtrak Cascades was up 21.9%, and revenue increased 23.1%, over the same period last year. This mirrors the year's overall gains in national Amtrak ridership, which set a record for the most passengers since operations began in 1971. (pp. 60-62)

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Maintaining Stormwater Treatment Facilities annual report 7
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Highway Congestion annual report 10
Comparative analysis of 2007 to 2005 travel times, delay, volume, throughput, and Before & After anaylsis. Turn to page 10 for a directory of all the features within this year's Congestion Report.

Air Quality & Noise annual reports 70
Includes information on noise barriers constructed, test quiet pavements, and stricter air quality requirements.

Capital Project Delivery Programs 79
With full construction performance dashboard on pages 80-81.

Completed Project Wrap-Ups 102
A new feature that examines the budget and schedule performance of all projects completed within the quarter.

Project Spotlight 112
A new feature, examining a major WSDOT project every quarter. This month: the I-405 highway widening projects.

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Navigating the WSDOT Information Stream

Linking performance measures to strategic goals

WSDOT's mission The mission of WSDOT is to keep people and business moving by operating and improving the state's transportation systems vital to our taxpayers and communities.

The *Gray Notebook* is the basis for WSDOT performance reporting that links performance measures for the strategic plan, legislative, and executive policy directions, as well as federal reporting requirements.

Statewide transportation policy goals

In 2007, the Governor and Legislature enacted a new law establishing five policy goals for transportation agencies in Washington State (Chapter 516, Laws of 2007).

The five statewide transportation policy goals are:

- Safety: To provide for and improve the safety and security of transportation customers and the transportation system;
- Preservation: To maintain, preserve, and extend the life and utility of prior investments in transportation systems and services;
- Mobility (Congestion Relief): To improve the predictable movement of goods and people throughout Washington state;
- Environment: To enhance Washington's quality of life through transportation investments that promote energy conservation, enhance healthy communities, and protect the environment; and
- Stewardship: To continuously improve the quality, effectiveness, and efficiency of the transportation system.

The Transportation Progress Report

Under the new law, the Washington State Office of Financial Management (OFM) is responsible for setting objectives and establishing performance measures for each of the goals. OFM must report on the attainment of the goals and objectives to the Governor and Legislature each biennium. In January, 2008, OFM published a "baseline" report to get feedback from the Governor and Legislature on draft objectives and performance measures.

The Attainment Report is available on OFM's performance and results website: http://www.ofm.wa.gov/performance/ The next report will be completed by January 2009.

WSDOT Strategic Plan

WSDOT's 2009-2015 strategic plan *Business Directions* summarizes WSDOT's work plan based on the programs and budgets authorized by the State Legislature and the Governor. The plan describes the agency strategic directions and initiatives to address critical programs and service delivery mandates. The table on pages viii-ix illustrates this alignment. WSDOT's 2009-11 strategic plan is available online at: http://www.wsdot.wa.gov/Accountability/PerformanceReporting/StrategicPlan.htm.

Other performance reporting requirements

Priorities of Government (POG)

POG is an investment prioritization process used to help the Governor and Legislature develop agency budgets. Every biennium, workgroups composed of government agency and private sector representatives identify results that citizens expect from government, and evaluate the performance of state agency activities and services against those expected results. Information about the 2009-11 POG process is available at: http://www.ofm.wa.gov/budget/pog

Government Management Accountability and Performance program (GMAP)

GMAP is a management tool that promotes the sharing and evaluation of current performance to improve results. Under GMAP, the Governor and her leadership team meet in "GMAP forums" with agency directors to review results and develop action plans to improve results. These meetings provide an opportunity for candid conversations about what is working, what is not, and how to improve results.

WSDOT regularly reports to the Governor during the Transportation GMAP forums. Information about GMAP can be found at: http://www.accountability.wa.gov/default.asp.

About WSDOT's Performance Dashboard

A new 'dashboard' of performance measures (next page) is presented in this edition. This dashboard, currently in draft form, offers readers a snapshot glance at WSDOT's progress against the five statewide policy goals and WSDOT's strategic plan. Some results are discussed in depth within this edition of the *Gray Notebook*, while others are in previous editions or will be updated in coming editions based on established reporting cycles.

Performance Dashboard

✓ Goal has been met. ↑ Performance is trending in a favorable direction. ↔ Trend is holding. ↓ Performance is trending in a unfavorable direction.

Policy goal/Performance measure	Previous reporting period	Current reporting period	Goal	Goal met	Progress	Comments
Safety						
Number of **traffic fatalities** per 100 million vehicle miles traveled (VMT) in Washington State (annual measure, calendar years 2006 & 2007)	1.12	1.0	1.0	✓	↑	Working toward additional reductions through *Target Zero*
Yearly **OSHA-recordable injury and illness rate** per 100 WSDOT maintenance & engineering workers (annualized: FY08 Q4, FY09 Q1[6])	5.3	4.2	6.0	✓	↑	Continuing to aggressively improve worker safety
Preservation						
Percentage of state **highway pavements** in fair or better condition (annual measure, calendar years 2006 & 2007)	93.5%	93.3%	90.0%	✓	↔	Performance level exceeds goal - challenges ahead
Percentage of **state bridges** in fair or better condition (annual measure, calendar years 2006 & 2007)	97.4%	97.0%	97.0%	✓	↔	Performance level meets goal - trending downward
Mobility (Congestion Relief)						
Average clearance times for **major (90+ minute) incidents** on key Puget Sound corridors (quarterly: FY08 Q4, FY09 Q1[6]))	153 minutes	147 minutes	5% reduction	✓	↑	Met 5% goal, included in "*Moving Washington*" initiative
Percentage of **Washington State Ferries** trips departing on-time[2] (quarterly: FY08 Q4, FY09 Q1[6])	92%	87%	90%	---	↓	Quarterly performance declined with busy summer season
Percentage of **Amtrak *Cascades*** trips arriving on-time[3] (quarterly: FY08 Q4, FY09 Q1[6])	62%	61%	80%	---	↔	Performance is holding steady after improving last quarter
Annual weekday **hours of delay** statewide on highways compared to maximum throughput (51 MPH)[1] in thousands of hours (annual measure, calendar years 2006 & 2007)	23,330	25,490	N/A	---	↓	The rate of growth in delay declined from 35% to 8% between 2007 and 2005
Environment						
Cumulative number of WSDOT **stormwater treatment facilities** constructed or retrofitted[4] (annual measure, calendar years 2006 & 2007)	761	809	N/A	---	↑	New stormwater facilities permit will expand WSDOT's responsibilities
Cumulative number of WSDOT **fish passage barrier improvements** constructed since 1990 (annual measure, calendar years 2006 & 2007)	205	218	N/A	---	↑	More then 400 linear miles of habitat restored (estimated)
Stewardship						
Total number of Nickel and TPA **projects delivered, and percentage of on-time and on-budget delivery performance** (quarterly: FY08 Q4, FY09 Q1[6])	152 / 77%	167/ 78%	90% on-time and on-budget	---	↑	On-time and on-budget delivery performance improved over last quarter despite challenges.
Variance of total project costs compared to **Legislative budget expectations**[5] (quarterly: FY08 Q4, FY09 Q1[6])	0%	0%	0%	✓	↑	Overall program delivered under budget
Percentage of **completed contracts** final costs within 10% of the original award amount (annual measure, state fiscal years 2007 & 2008[6])	80.1%	85.5%	100%	---	↑	Performance has improved with better estimates and contract documentation

[1] 'Maximum throughput' is defined as the optimal traveling speed, where the greatest number of drivers can occupy the highway at the same time; usually measured as 51 MPH. The data represents the year prior to the year in which it was reported.
[2] 'On-time' departures for Washington State Ferries includes any trip recorded by the automated tracking system as leaving the terminal within 10 minutes of the scheduled departure time.
[3] 'On-time' arrivals for Amtrak *Cascades* are any trips that arrive at their destination within 10 minutes or less of the scheduled time.
[4] Facilities in Clark, King, Pierce, and Snohomish counties.
[5] Budget expectations are the figures established by the Legislature annually for major projects under construction.
[6] WSDOT's fiscal year begins on July 1 and ends on June 30. There are eight fiscal quarters in the biennium, and are organized as follows: Quarters 1 & 5: July 1 - September 30, Quarters 2 & 6: October 1 - December 31, Quarters 3 & 7: January 1 - March 31, Quarters 4 & 8: April 1 - June 30

Navigating the WSDOT Information Stream

Linking performance measures to strategic goals

This table illustrates the alignment of WSDOT's performance measures with the five statewide transportation policy goals and the WSDOT strategic plan, *Business Directions*. (See also pg. vi)

Policy Goal	WSDOT Business Direction	Key WSDOT Performance Measures	Reporting Cycle	Last *Gray Notebook* Report
1. Safety: To provide for and improve the safety and security of transportation customers and the transportation system	Vigilantly reduce risks and increase safety on all state-owned transportation modes; reduce fatalities and serious injuries; assist local communities in identifying effective solutions to transportation safety needs.	Number of traffic fatalities	annual	GNB 30 pp. 4
		Rate of traffic fatalities per 100 million miles traveled	annual	GNB 30 pp. 4
		Percent reduction in collisions before and after state highway improvements	annual	GNB 30 pp. 6-7
		Number of recordable workplace injuries and illnesses	quarterly	GNB 31 pp. 2-4
2. Preservation: To maintain, preserve, and extend the life and utility of prior investments in transportation systems and services.	Catch up with all necessary maintenance and preservation needs on existing highways, bridges, facilities, ferry vessels, airports, and equipment, while keeping pace with new system additions.	Percent of state highway pavement in fair or better condition	annual	GNB 28 pp. 53
		Percent of state bridges in fair or better condition	annual	GNB 30 pp. 13
		Percent of targets achieved for state highway maintenance activities	annual	GNB 28 pp. 74
		Number of ferry vessel life-cycle preservation activities completed	quarterly	GNB 31 pp. 67
		Percent of ferry terminals in fair or better condition	quarterly	GNB 30 pp. 25
3. Mobility (Congestion Relief): To provide for the predictable movement of goods and people throughout the state.	Move people, goods, and services reliably, safely, and efficiently by adding infrastructure capacity strategically, operating transportation systems efficiently, and managing demand effectively.	Travel times and hours of delay on the most congested state highways	annual	GNB 27 pp. 61-84
		Reliable travel times on the most congested state highways around Puget Sound	annual	GNB 27 pp. 61-84
		Percentage of commute trips while driving alone	annual	GNB 27 pp. 92
		Average length of time to clear major incidents lasting more than 90 minutes on key highway segments	quarterly	GNB 31 pp. 58
		Ferry ridership	quarterly	GNB 31 pp. 63
		Ferry trip reliability	quarterly	GNB 31 pp. 65
		Percent of ferry trips on-time	quarterly	GNB 31 pp. 66
		Amtrak *Cascades* ridership	quarterly	GNB 31 pp. 60
		Percent of Amtrak *Cascades* trips on time	quarterly	GNB 31 pp. 61

Linking performance measures to strategic goals

Policy Goal	WSDOT Business Direction	Key WSDOT Performance Measures	Reporting Cycle	Last *Gray Notebook* Report
4. Environment: Enhance Washington's quality of life through transportation investments that promote energy conservation, enhance healthy communities, and protect the environment.	Protect and restore the environment while improving and maintaining Washington's transportation system.	Conformance of WSDOT projects and programs with environmental legal requirements	annual	GNB 30 pp. 36
		Number of fish passage barriers fixed and miles of stream habitat opened up	annual	GNB 30 pp. 39
		Number of WSDOT stormwater treatment facilities constructed or retrofitted	annual	GNB 28 p. 67
		Number of vehicle miles traveled	annual	GNB 27 pp. 74
		Transportation-related greenhouse gas emissions (measure to be developed)	n/a	n/a
5. Stewardship: To continuously improve the quality, effectiveness and efficiency of the transportation system	Enhance WSDOT's management and accountability processes and systems to support making the right decisions, delivering the right projects, and operating the system efficiently and effectively in order to achieve the greatest benefit from the resources entrusted to us by the public.	Capital project delivery: on-time and within-budget	quarterly	GNB 31 pp. 78-126

Navigating the WSDOT Information Stream

Organization of the redesigned *Gray Notebook*

Through 30 editions, a little more than seven years, WSDOT has published a quarterly performance report titled *Measures, Markers & Milestones*, but known far and wide by its informal moniker, the *Gray Notebook*. Between its gray covers, it was organized in two sections:

- the Beige Pages, so-called for the color of paper they were printed on, which covered project delivery on the Nickel, Transportation Partnership Account (TPA), and Pre-Existing Funds project programs, and
- the White Pages, which presented quarterly and less frequent reports on a wide variety of transportation-related topics.

With the 30th edition, the *Gray Notebook* (now its formal title) made a host of other changes. This page will help you find the information and reports you are looking for.

How is the new *Gray Notebook* organized?

The *Gray Notebook (GNB)* presents articles in a way that makes the topics' relationship to the five Legislative policy goals – and WSDOT's own strategic goals – more clear. (These goals are discussed in detail on page vi.)

The *Gray Notebook* is organized into five sections devoted to those strategic goals, each marked by a page that recaps WSDOT's goals for Safety, Preservation, Mobility/Congestion Relief, Environment, and Stewardship. Each section divider carries a mini-directory to the topics covered within the section, and points to other articles within the GNB that contain information relevant to that goal.

The first four sections primarily feature quarterly and annual reports on key agency functions, providing regularly updated system and program performance information that was previously covered in the White Pages. Annual system performance updates are rotated over four quarters based on data availability and relevant data cycles, to provide in-depth analysis of topics such as capital facilities, aviation, freight, and a post-winter report on highway maintenance. Quarterly topics, such as worker safety, incident response, Amtrak *Cascades*, and Washington State Ferries, are featured in each edition since data is generally available more frequently.

The Beige Pages are still beige; reporting on the delivery of the projects funded in the 2003 Transportation Funding Package (Nickel), 2005 Transportation Funding Package (TPA), and Pre-Existing Funds (PEF), they appear in the Stewardship section. They contains summary tables, detailed narrative project summaries, and financial information supporting WSDOT's "no surprises" reporting focus. The Stewardship section also presents articles covering finance, workforce, and similar issues.

More easily tracked business plan results

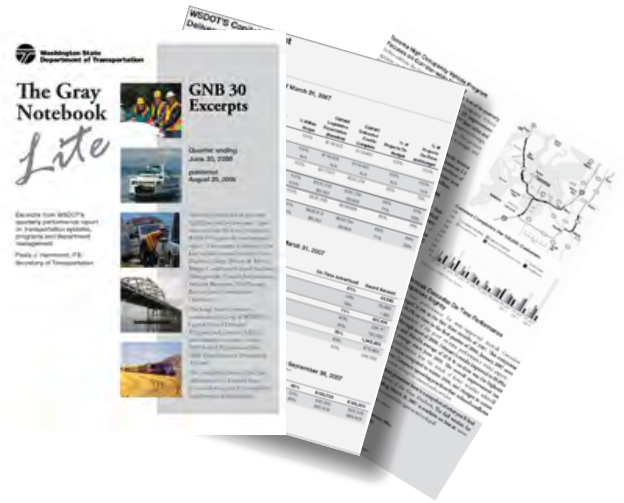
By aligning the *Gray Notebook*'s articles with WSDOT's business goals as outlined in the strategic plan, *Business Directions*, we hope to making tracking measurable performance results against specific strategic actions more simple.

Business Directions reflects WSDOT's program and project delivery responsibilities with the goal of demonstrating the best possible return for taxpayers' dollars. For a copy of *Business Directions*, please visit: http://www.wsdot.wa.gov/Accountability/PerformanceReporting/StrategicPlan.htm.

Publication frequency and archiving

The *Gray Notebook* is published quarterly in February, May, August and November. This edition and all past editions are available online at http://www.wsdot.wa.gov/Accountability/GrayNotebook/gnb_archives.htm.

A separate detailed navigation folio is available at http://www.wsdot.wa.gov/Accountability/GrayNotebook/.



Gray Notebook Lite

WSDOT publishes a quarterly excerpt of selected performance topics and project delivery summaries from the *Gray Notebook*, called *Gray Notebook Lite*. *Lite* allows for a quick review and provides a short synopsis of selected topics. It is published as a four-page folio with a two-page Beige Page summary insert and can be accessed at http://www.wsdot.wa.gov/Accountability/GrayNotebook/navigateGNB.htm.

Navigating the WSDOT Information Stream

Online capital project reporting and using the website

WSDOT prepares information for legislators, state and local officials, interested citizens, and the press on the progress of the state's three capital delivery programs. The *Gray Notebook*, in the Beige Pages section, highlights each quarter's progress and reports on financial and other program management topics, but much more detailed information can be found on-line at the WSDOT website.

WSDOT's on-line project reporting uses several different tools, including the *Gray Notebook* (as a downloadable PDF), web-based Project Pages, and Quarterly Project Reports (QPRs). There is a Project Page on the website for each major WSDOT project, and QPRs for Nickel-funded projects in the 2003 Transportation Funding Package.

Navigating the WSDOT website

The WSDOT home page (shown at left; www.wsdot.wa.gov) offers several ways to find information on projects. The Projects tab on the top navigation bar links to the WSDOT's Projects page; there, you'll find information and links to detailed descriptions of all WSDOT projects. The Accountability navigation menu offers links to several important topics (including Congestion Relief, Safety, and Preservation) and the most recent edition of the *Gray Notebook*.

Project Pages

Project Pages (found at www.wsdot.wa.gov/projects/, shown below) report on all WSDOT capital delivery program projects. Project Pages provide details on overall project vision, funding components, financial tables, milestones, status description, problem discussions, risks and challenges, forecasting, maps, photos, links and more, all updated regularly.

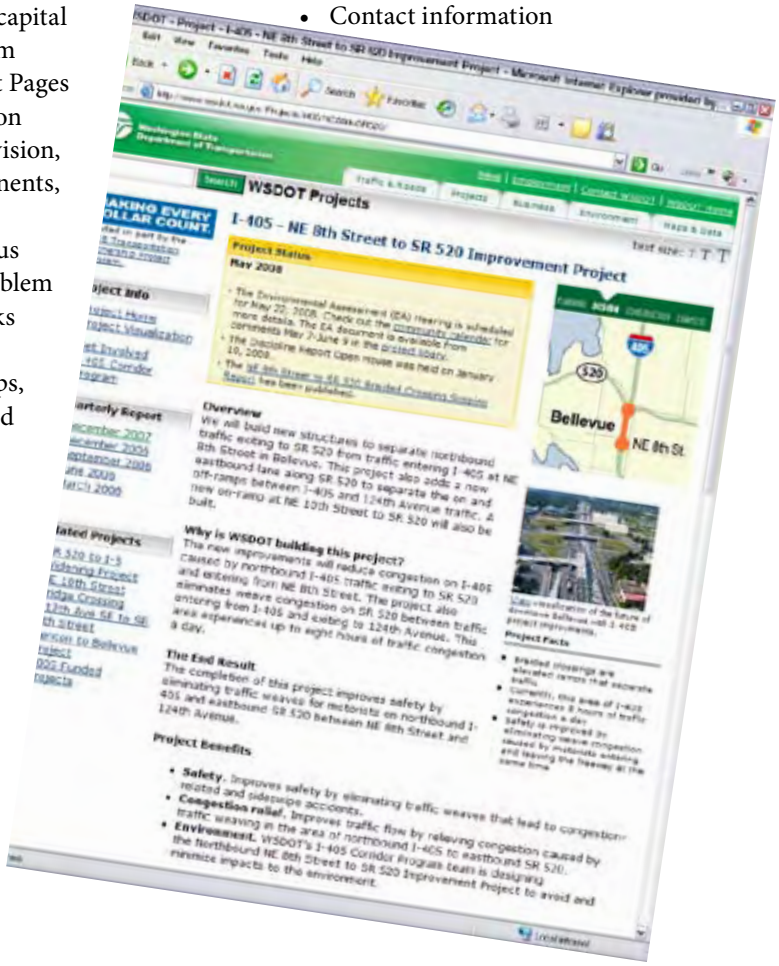
Project Pages cover:

- Overall project vision
- Financial table, funding components
- Roll-up milestones
- Roll-up cash flow, contact information
- Maps and Links to QPRs

Quarterly Project Reports

The Quarterly Project Reports (QPRs) are reached by a link on the Project Page. They summarize quarterly activities:

- Highlights
- Milestones
- Status description
- Problem statement
- Risks and challenges
- Project costs, cash flow
- Contact information



Contributors

The work of many people goes into the writing, editing, and production of the *Gray Notebook* every quarter. This list of contributors reflects the efforts of data anaysts, engineers, project leads, and many more individuals behind the scenes. Information is reported on a preliminary basis as appropriate and available for internal management use; it is subject to correction and clarification. On-line versions of this publication are available at www.wsdot.wa.gov/accountability

Contributors		
Safety	Worker Safety	Joel Amos, Cathy English, Olga Peterman
Preservation	Stormwater Facilities	Anna Zaharris, Norm Payton, Dick Gersib
Mobility/ Congestion Relief	Intelligent Transport Systems	Katherine Boyd, Bill Legg, Diane McGuerty, Matt Neeley, Ron Vessey, Anna Zaharris
	Annual Congestion Report	Matt Beaulieu, Katherine Boyd, Keith Cotton, Delwar Murshed, Dave Giles, Manouchehr Goudarzi, Mark Hallenbeck, Craig Helmann, John Ishimaru, Jamie Kang, Ruth Kinchen (King City Metro), Basma Makari, Tyler Patterson, Charles Prestrud, Benjamin Smith (Sound Transit), Pete Swensson (Thurston Regional Planning Council), Ted Trepanier, Marjorie Vanhoorelbeke, Harold White, Mike Wold (King County Metro) Shuming Yan
	Washington State Ferries	John Bernhard, Tim Browning, Dave Burns, Matt Hanbey, Al McCoy
	Rail	Vickie Sheehan, Jeff Schultz, Ken Uznanski
	Incident Response	Katherine Boyd, Paula Connelley, Jim Hill (WSP), Captain Bob Johnson (WSP), Marcia Marsh (WSP), Diane McGuerty, Rick Phillips, Victoria Ricketts (WSP), Krystle Spice, Tom Stidham
Environment	Endangered Species Act documentation	Erin Britton, Marion Carey
	Air Quality	Jonathon Olds, Timothy Sexton
	Noise Quality	Jim Laughlin, Timithy Sexton, Jeff Uhlmeyer
Stewardship	WSDOT's Capital Project Delivery Programs (the Beige Pages)	Project Control and Reporting Office, Claudia Lindahl, Regional Program Managers
	Hood Canal Bridge Project Update	Becky Hixson, Joe Irwin
	Tacoma Pierce Co. HOV Lanes	Claudia Cornish
	I-405 Project Spotlight	Rick Smith
	PMRS	Rose This
	Consultant Use	Larry Schofield
	Hot Mix Asphalt	Jenna Fettig
	Workforce Level and Training	Dave Acree, Margarita Mendoza de Sugiyama, Matthew Moreland, Adrienne Sanders, David Supensky
	Program Highlights	Ann Briggs
GNB Production	Production Team	Laura Cameron, Dan Genz, Karl Herzog, Ed Spilker, Stephanie Stoddard, Eric Thomas, Tyler Winchell
	Graphics	Chris Britton, Steve Riddle, Chris Zodrow
	Publishing and Distribution	Linda Pasta, Trudi Philips, Deb Webb
For information, contact:	Daniela Bremmer, Director **WSDOT Strategic Assessment Office** 310 Maple Park Avenue SE, PO Box 47374, Olympia, WA 98504-7374 Phone: 360-705-7953 :: E-mail: bremmed@wsdot.wa.gov	

Safety

Statewide policy goal:

To provide for and improve the safety and security of transportation customers and the transportation system.

WSDOT's business goal:

To vigilantly reduce risks and improve safety on all state-owned transportation modes; reduce fatalities and serious injuries; assist local communities in identifying effective solutions to transportation safety needs.

In this section

Quarterly Report: Worker Safety 2

See also

Incident Response 57
Workforce Training 131-132

Earlier safety-related articles

Highway Safety, GNB 30
Safety Rest Areas, GNB 29

Worker Safety: Quarterly Update

WSDOT Employees: Recordable injuries and illnesses

WSDOT sets new reduction goal for FY 2009

The reduction goal for fiscal year (FY) 2009 is to reduce OSHA-recordable injuries and illnesses among employees by 60% from the FY 2006 baseline of 525 to 212, an annual reduction of 315 injuries. Fiscal year 2009 opened with 86 total injuries and illnesses, a decrease of 47 from the previous quarter. To date, the Southwest, South Central, and Urban Corridors regions remain on track to meet their goals.

Preventing sprain and strain injuries continues to be a challenge

Fifty-six percent of the total injuries in the first quarter were sprains and strains. Sprain and strain-type injuries can be separated into two primary categories: ergonomics (musculoskeletal disorders and over-exertion injuries) and slip/trip/fall-related. Fifty-six percent of the first quarter's sprain and strain injuries were related to ergonomics while 35% were caused by slip/trip/falls. The remaining 9% were related to vehicle operation.

To reduce the occurrence of ergonomics-related injuries and illnesses, WSDOT has an ergonomics program requiring training of every new employee on risk factors; it also requires investigations into every incident that resulted in an ergonomics-related injury. WSDOT's ergonomics intranet website contains training and educational materials available to every WSDOT employee. Employees must also recognize the risk factors and risk-control measures in their Pre-activity Safety Plans.

The most effective tool in preventing slip/strip/fall injuries is education on recognizing hazards and applying this knowledge towards avoiding these hazards on the job. WSDOT has made training available to all employees on how to prevent slip/trip/falls via its safety intranet webpage.

In addition, WSDOT is currently developing a wellness program to help address the broader issues of physical and psycho-social aspects of sprain and strain prevention.

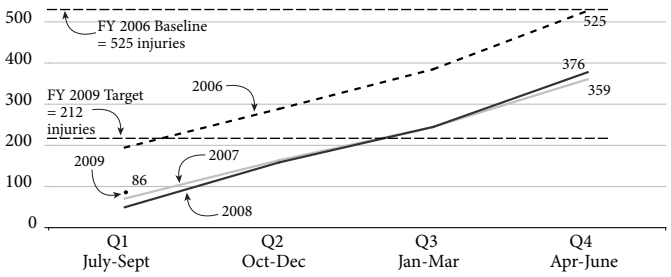
Worker Safety Highlights

WSDOT has sustained 86 injuries/illnesses for the first quarter of FY 2009, an increase of 38 over this time last year.

More than half of the injuries sustained this quarter (48) were sprains and strains.

Cumulative OSHA-recordable injuries and illnesses

FY 2006 - 1st quarter FY 2009 (July 1 - Sept. 30)



Data Source: WSDOT Safety Office.

Progress towards achieving OSHA-recordable injury reduction goal (by region)

FY 2009 through quarter 1; Target goal: 60% reduction in OSHA-recordable injuries (212 injuries/illnesses; FY 2006 baseline of 525)

Region	FY 06 Baseline	FY 08 Q1 Total	FY 09 Q1 Total	FY 09 Target	Comments	On-track Y/N
Northwest	122	13	16	49	10 of the 16 injuries sustained were sprain/strain injuries.	No
North Central	33	3	4	13	2 of the 4 injuries sustained were sprain/strain injuries.	No
Olympic	71	4	9	28	4 of the 9 injuries sustained were sprain/strain injuries.	No
South Central	33	1	2	13	1 of the 2 injuries sustained was a sprain/strain injury.	Yes
Southwest	31	1	3	12	1 of the 3 injuries sustained was a sprain/strain injury.	Yes
Eastern	56	3	8	22	5 of the 8 injuries sustained were sprain/strain injuries	No
Urban Corridors[1]	N/A	0	0	4	No injuries.	Yes
Headquarters	23	4	3	9	No sprain/strain injuries.	No
Ferry System	156	19	41	62	25 of the 41 injuries sustained were sprain/strain injuries.	No
WSDOT Total	**525**	**48**	**86**	**212**	**47 of the 86 injuries sustained were sprain/strain.**	No

Data Source: WSDOT Safety Office.

[1]WSDOT started tracking OSHA-recordable injuries for Urban Corridors (UCO) as a separate region in FY 2008; it was initially part of the Northwest region.

[2]As a result of rounding by regions, the goal of 212 total injuries/illnesses for FY 2009 is slightly more than a 60% reduction of the WSDOT baseline.

WSDOT Workers: Recordable injuries and illnesses

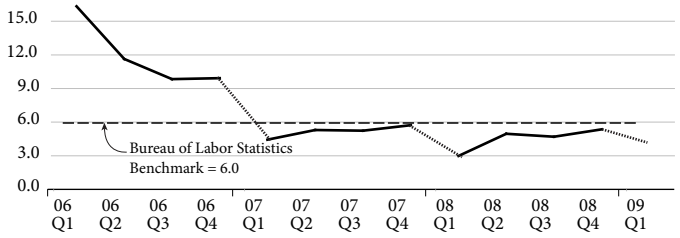
OSHA-recordable injury and illness rates[1]: annualized

Highway, street, and bridge construction workers

The injury rate for WSDOT's highway, street, and bridge construction workers was 4.2 per 100 workers during the first quarter, which is 1.1 lower than the previous quarter. WSDOT's current rate is lower than the most recent Bureau of Labor Statistics Benchmark (2006) by 1.8.

Yearly OSHA-recordable injuries and illnesses rate for maintenance and engineering workers: annualized

FY 06 - 1st quarter FY 09; OSHA-recordable injury rate per 100 workers[1]



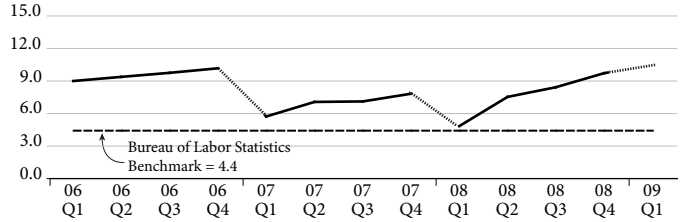
Data Source: WSDOT Safety Office.
[1]Rates are only cumulative for each fiscal year.

Ferry system

Ferry workers' annualized injury rate through the first quarter was 10.5 per 100 workers. This is 0.8 more than the previous quarter. The ferry system's current rate is higher than the most recent Bureau of Labor Statistics Benchmark (2006) by 6.1 in the industry classification of Inland Water Transportation Workers.

Yearly OSHA-recordable injuries and illnesses rate for ferry system workers: annualized

FY 06 - 1st quarter FY 09; OSHA-recordable injury rate per 100 workers[1]



Data Source: WSDOT Safety Office and WSDOT Ferry System.
[1]Rates are only cumulative for each fiscal year.

Number of OSHA-recordable injuries/illnesses by category of WSDOT worker

Highway maintenance workers

For the first quarter FY 2009, highway maintenance workers reported 30 injuries, 35% of all injuries agency-wide. This was 19 less than the previous quarter. There were 131 days away from work associated with these injuries, and 16 were sprain/strain injuries.

Highway engineering workers

For the first quarter, highway engineering workers reported 13 injuries, 15% of all injuries agency-wide. This was 12 less than the previous quarter. There were 12 days away from work associated with these injuries, and five were sprain/strain injuries.

Administrative staff

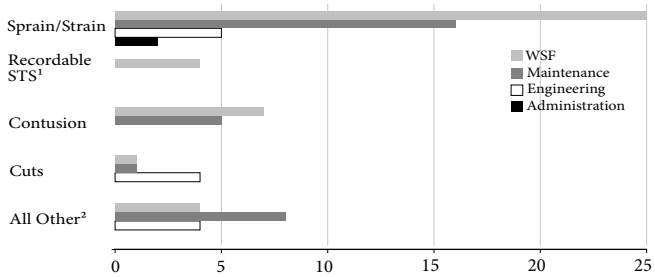
There were two injuries to WSDOT administrative staff for the first quarter of FY 2009. This is five less than the previous quarter. There were four days away from work associated with these injuries. The injured parts of the body were the back and shoulder.

Ferry system

Ferry system workers reported 41 injuries for the first quarter, 48% of all injuries agency-wide. This was 11 less than the previous quarter. There were 534 days away from work associated with these injuries, and 25 were sprain/strain injuries.

Number of work injuries by type

July 1 through September 30, 2008 (first quarter, FY 2009)



Data Source: WSDOT Safety Office and Washington State Ferries (WSF).
Note: If no measure is shown, no injuries of that type were reported by other WSDOT groups.
[1]An OSHA recordable Standard Threshold Shift (STS) is if an employee's hearing test reveals that the employee experienced a work-related STS in hearing in one or both ears, and the employee's total hearing is 25 dB or more above audiometric zero (averaged at 2000, 3000 and 4000 Hz) in the same ear(s) as the STS, the case must be considered recordable.
[2]Calculated by subtracting the above subtotals from the total reported injuries for the quarter.

[1]OSHA-recordable Injuries and Illnesses is a standard measure that includes all related deaths and work-related illnesses and injuries which result in death, loss of consciousness, days away from work, days of restricted work, or medical treatment beyond first aid. The U.S. Bureau of Labor Statistics provides the selected 2006 national average benchmark. One worker equals 2,000 hours per year.

Worker Safety: Quarterly Update

WSDOT Workers: Preventing injuries and illnesses

Preventing vehicle backing accidents

An alarming number of accidents involving injury to a person from a vehicle backing up are being reported. In the last two years, WSDOT has had 166 accidents involving the backing of vehicles, three of which resulted in fatalities to WSDOT's contractor partners.

Employees are asked to be fully aware of the work environment so they do not become complacent about routine activities, such as backing a vehicle. As this is a developing critical issue, more information will be forthcoming.

July 2008 Safety Stand Down affirms WSDOT commitment to worker safety

WSDOT held its third annual Safety Stand Down on July 23, 2008, to affirm the agency's continuing commitment to worker safety. This year's Stand Down was hosted by Secretary Paula Hammond and was broadcast to more than 100 WSDOT locations statewide. Secretary Hammond challenged employees to prepare regular, pre-activity safety plans and to recognize hazards in their own workplaces.

The presentation emphasized recognizing hazards and reporting all accidents, including those that do not result in injuries or illnesses (also known as near-misses) in order to prevent similar situations from becoming injury accidents.

The event recognized a group of WSDOT employees who took the initiative to develop solutions to make their jobs safer. These solutions ranged from the ingeniously simple—such as tying knots in a rope to offer a better grip to Olympic Region's bridge workers descending steep slopes—to the literally life-saving—such as North Central Region's avalanche control team, which developed an alarm that warns winter highway workers if their avalanche locator beacons are not working properly. Grassroots solutions and employee ownership of their own safety are hallmarks of world class safety programs.

Safety performance for the prior fiscal year was also reviewed, identifying the prevalent injuries that continue to occur at WSDOT. It was also noted that while the safety reduction goal for FY 2008 was not met (376 injuries were sustained, 112 more injuries than the goal of 264), the number and cost of claims had decreased, as were missed work and restricted duty days.

WSDOT executives spoke about safety at the Safety Stand Down on July 23, 2008. Pictured from left: Chris Christopher, Dave Dye, Paula Hammond, Jerry Lenzi, and David Moseley.

Finally, the Secretary announced that the safety focus for the upcoming fiscal year was to reduce injuries by 60% to 212 from the FY 2006 baseline of 525 injuries.

WSDOT safety program survey

WSDOT's employees' thoughts and experiences play a key role in the continuing effort to improve the safety program. Following the 2008 Safety Stand Down, WSDOT concluded a safety program survey of its employees.

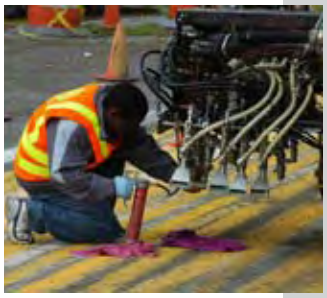
The large majority of employees said the safety program is headed in the right direction. Of the 1,644 employees who responded to the survey, 74% said WSDOT's safety program had changed their behavior to work more safely; 90% said they had received adequate training in recognizing job hazards and ways to prevent or avoid them.

Many of the respondents also took the time to make thoughtful recommendations on how to improve the program. Suggestions included the continuation of meetings, pre-activity safety plans, training, and emphasizing personal responsibility for safety.

These suggestions, as well as responses to all other questions on the safety survey, will be evaluated by the safety staff and recommendations for continuing program improvements will be made.

For complete results of the safety survey, please see: http://www.wsdot.wa.gov/NR/rdonlyres/6ECB8C76-6A03-453E-A55D-96970BEC19FE/0/WSDOTSafetyProgramSurvey08.pdf

Preservation



Legislative policy goal:

To maintain, preserve, and extend the life and utility of prior investments in transportation systems and services.

WSDOT's strategic goal:

To catch up with all necessary maintenance and preservation needs on existing highways, bridges, facilities, ferry vessels and terminals, airports, and equipment, while keeping pace with new system additions.

preservation

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See also

Washington State Ferries 63
Report on Capital Projects (Beige Pages) 78

Previous GNB reports

Capital Facilities, GNB 30
Bridge Assessment, GNB 30
Safety Rest Areas, GNB 29

Preservation Reporting

WSDOT strives to extend the life and utility of Washington State's transportation infrastructure through effective and efficient maintenance and preservation. This section of the *Gray Notebook* serves as a periodic examination of the department's preservation efforts towards meeting this goal. The table below contains all of the current performance measures used in past *Gray Notebooks* and the 09-11 Strategic Plan: *Business Directions*, which evaluate the effectiveness of individual, preservation programs and their goals. Note that as the *Gray Notebook* continues to evolve to align with the Strategic Plan, article organization and publication dates may change.

Measuring and reporting on preservation performance helps WSDOT evaluate the effectiveness of programs designed to maintain existing and new transportation infrastructure, preserve aging systems, and improve local conditions for travelers and citizens alike. For example, WSDOT monitors the condition of transportation facilities such as safety rest areas, highway pavement, and state bridges in order to determine the proper level of maintenance and preservation, or in some cases replacement.

Preservation reports and performance measures by quarter

Measure	Performance Measure	Appears in
Safety Rest Areas	Percent of rest areas in fair or better condition	March 31, 2008
State Aviation System	Percent of runway surfaces in fair or better condition	March 31, 2008
Post-Winter Report	Winter maintenance expenditures and material usage	March 31, 2008
State Bridges	Percent of state bridges in fair or better condition	June 30, 2008
	Percent of bridges Structurally Deficient and/or Functionally Obsolete	June 30, 2008
	Funding allocations for local bridges	TBD*
	Number of major bridge replacement projects completed	TBD*
WSDOT Capital Facilities	Percent of facilities in fair or better condition	June 30, 2008
	Backlog of deferred maintenance items	June 30, 2008
	Percent of preventive maintenance activities completed	June 30, 2008
Intelligent Transportation Systems	Traffic operations equipment maintenance and preservation backlogs	TBD*
	Percent of signals meeting operational review schedule	TBD*
	Percent of highways and ferries system monitored	TBD*
Stormwater Facility Maintenance	Percent of targets met related to stormwater maintenance**	September 30, 2008
Highway Pavement Conditions	Percent of state highway pavement in fair or better condition	December 31, 2007
	Funding allocations for local pavement	TBD*
Integrated Vegetation Management	Percent of herbicide use for roadside maintenance	December 31, 2007
Highway Maintenance - Maintenance Accountability Process (MAP)	Percent of targets met for state highway maintenance activities	December 31, 2007
Legacy Computer Systems	Preservation and replacement milestones met	TBD*
Ferry Vessels	Percent of state ferry vessel, life-cycle preservation activities completed	September 30, 2008
Ferry Terminals	Percent of state ferry terminals in fair or better condition	September 30, 2008

*These measures have been identified in WSDOT's 2009-11 Strategic Plan: *Business Directions*. Reporting dates in the *Gray Notebook* will be determined in the future.
**Stormwater maintenance performance is tracked under the Maintenance Accountability Process (MAP) for highway maintenance.

Maintaining Stormwater Treatment Facilities

Effective stormwater management is a high priority for WSDOT. Paved surfaces—such as those on highways, rest areas, and park-and-ride lots—do not allow water to penetrate the ground where it can be naturally filtered and cleansed before entering streams and underground water supplies. If left untreated, water running off paved surfaces can pick up oil, heavy metals, fertilizers, pesticides, soil, trash, and animal wastes, and carry these pollutants into rivers and lakes. For every inch of rain that falls on an acre of pavement, 27,000 gallons of stormwater are produced.

Bioinfiltration swale on SR 500 in Vancouver, Washington.

Statewide, WSDOT manages over 40,000 acres of paved surfaces. Managing stormwater helps fulfill WSDOT's environmental stewardship commitments and meet federal and state regulatory requirements. Stormwater management also reduces localized erosion and flooding problems, and contributes to Puget Sound and salmon recovery. WSDOT manages stormwater by constructing, operating, and maintaining stormwater treatment facilities. This article focuses on WSDOT's stormwater facility maintenance activities.

New permit expands WSDOT's stormwater responsibilities

Historically, WSDOT managed stormwater to maintain safe driving conditions and prevent damage to highways. In 1995, WSDOT began managing stormwater under a Department of Ecology permit covering the most populated areas in Clark, King, Snohomish, and Pierce counties.

A new permit, anticipated to be issued in fall 2008, will require WSDOT to expand its stormwater management program to a larger geographic area covering over 100 urban centers across the state, including some in Eastern Washington. The new permit will also require an increased number of stormwater retrofits of existing highways, additional inspections and more rigorous maintenance of stormwater treatment facilities, expanded monitoring and reporting, and performance assessments of stormwater management effectiveness.

New inspection and monitoring requirements

In addition to increasing WSDOT's stormwater facility maintenance responsibilities, the new permit will significantly expand inspection and monitoring requirements. Requirements include:

- Inventorying and mapping all stormwater outfalls (estimated between 15,000 – 25,000);
- Annual inspection of stormwater facilities and documentation of deficiencies;
- Correction of deficiencies as they are discovered;
- Monitoring and evaluating treatment facility performance;
- Ensuring that highway maintenance activities, such as sweeping, meet standards;
- Preparing stormwater pollution prevention plans for highway maintenance facilities, rest areas, and park-and-ride lots, and construction of associated treatment facilities;
- Helping develop watershed-based water cleanup plans; and
- Reporting annually to the Department of Ecology.

Stormwater Treatment Highlights

WSDOT currently manages over 2,100 stormwater treatment facilities.

A new stormwater permit is expected to be issued in fall 2008, requiring WSDOT to:

- expand its stormwater management program to cover over 100 urban centers across the state, and
- perform additional inspections and more rigorous maintenance of stormwater treatment facilities.

More information on WSDOT stormwater management is available at: http://www.wsdot.wa.gov/Environment/WaterQuality/.

Information on construction of stormwater treatment facilities is available in the December 31, 2007 *Gray Notebook*, p. 67.

Information on achievement of targets for stormwater facility maintenance is available in the December 31, 2007, *Gray Notebook*, p. 74.

Maintaining Stormwater Treatment Facilities

WSDOT's response to new stormwater requirements

The new permit is expected to significantly increase stormwater management and maintenance costs. Based on local government experiences with similar permits, the total cost of implementation is expected to be millions of dollars more than WSDOT currently spends on stormwater management each biennium. For example, monitoring a single site in conformance with Department of Ecology standards could cost $100,000 per year. WSDOT has requested additional funding to meet the new permit requirements.

Installation of oil-water separator at the I-5 Gee Creek Rest Area, Clark County.

Stormwater treatment facility maintenance activities

WSDOT currently manages over 2,100 stormwater treatment facilities. This number is increasing every year due to new construction and retrofitting of existing highways. WSDOT's maintenance activities are tailored to each type of facility, and must meet new standards under the new permit.

Major types of WSDOT stormwater treatment facilities and associated maintenance activities

Facility type	Number (as of 2007)	Function & environmental benefit	Required maintenance activities
Stormwater ponds	679	Reduce peak flows and erosion, settle out pollutants, infiltrate water into ground	Remove/dispose of sediment, unplug inlet/outlet pipes, repair ponds/pond liners, repair fencing/access roads, manage vegetation
Biofiltration swales (broad, grassy channels)	598	Spread out water into thin layer of grass to filter out pollutants	Remove/dispose of sediment, repair erosion, unplug inlet/outlet pipes, replant, mow, control nuisance weeds, trim brushy vegetation, remove trash
Dry wells (deep catch basins with perforated walls)	193	Infiltrate water into ground	Remove/dispose of sediments, repair structural deficiencies
Vegetated roadside filter strips	117	Filter out pollutants, infiltrate water into ground	Remove/dispose of sediment, repair erosion, replant, mow, control nuisance weeds, trim brushy vegetation, remove trash
Media Filter Drains (slopes conveying water through a specialized mix of crushed rock, dolomite, gypsum, and perlite)	109	Remove dissolved metals, infiltrate water into ground	Remove/dispose of sediment, manage water flow, replace specialized mix, reseed, mow, control nuisance weeds, trim brushy vegetation, remove trash
Vaults (similar to ponds but buried underground)	60	Reduce peak flows and erosion, settle out pollutants, infiltrate water into ground	Ensure vents are not plugged, remove/dispose of sediment, repair joints and cracks
Gravel-lined infiltration trenches	117	Infiltrate water into ground	Remove/dispose of sediment, clean/replace gravel, control nuisance weeds, remove trash
Oil-water separators	19	Remove oil	Remove/dispose of sediment and oil, repair joints and cracks, remove debris
Sand filters	4	Filter out pollutants	Remove/dispose of sediment and contaminated sand, ensure flow/percolation through filter, repair/unplug inlet/outlet pipes
Miscellaneous Facilities	244		

Data Source: WSDOT Maintenance and Operations Division.

Mobility
(Congestion Relief)

Statewide policy goal:

To improve the predictable movement of goods and people throughout the state.

WSDOT's business goal:

To move people, goods, and services reliably, safely, and efficiently, by adding infrastructure capacity strategically, operating transportation systems efficiently, and managing demand effectively.

Moving Washington

Moving Washington is WSDOT's three-part strategy to fight congestion on the state transportation system, make trips more reliable and safe, and improve overall traffic flow. Moving Washington strategies include:

Managing demand: *WSDOT is reducing demand on the system by providing citizens with options such as HOV lanes, Commute Trip Reduction programs, and Traveler Information.*

Operating efficiently: *WSDOT is making the system operate more efficiently by using tools such as ramp meters, synchronized traffic signals, and incident response trucks to clear traffic accidents.*

Adding capacity strategically: *WSDOT is delivering the largest transportation capital construction program in our state's history. Capital projects improve safety by relieving chokepoints that cause recurring congestion.*

More information on Moving Washington is available at:
http://www.wsdot.wa.gov/Congestion/

In this section

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Special Report: Fuel Price Impacts on Travel Behavior 12
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Quarterly Update: Washington State Ferries 63

See also

Quarterly Report on Capital Projects (Beige Pages) 78

Earlier mobility-related articles

Travel information, GNB 30
Freight and CVISN, GNB 29

Measuring Delay and Congestion
2008 Annual Update Executive Summary

Special Report: Fuel price impacts on travel behavior – First half of 2008	
Travel times and volumes: WSDOT analyzed conditions on seven major Seattle-area commuting corridors in the first six months of 2008, as gas prices surged above $4 per gallon. Average and reliable travel times for drivers on six of seven corridors improved during the peak periods as the strong economy kept vehicle volumes high, with peak period volumes increasing by +2% to +4%. Volumes declined on weekends and evenings as drivers reduced discretionary trips, changed destinations, and cut trips to save money.	pp. 12-14
Transit and HOV lane usage: Transit agencies serving Seattle-area communities reported rising passenger boardings tied to record fuel prices. Buses, trains, and vanpools experienced greater demand as commuters sought alternatives for reaching job sites. Nearly 9,000 more people rode Sound Transit Express commuter buses daily in July 2008, compared to July 2007, an increase of 23%. With buses transporting many more people than a year ago, the sharp increases in transit ridership likely enabled HOV lanes to move more commuters in fewer vehicles.	p. 16
Fuel consumption: Overall, Washington state fuel consumption fell by 63 million gallons, or 2.9%, for the fist 6 months of 2008.	p. 12
Fatal and serious injury collisions: A drop in collisions, including fatal and serious collisions, is also likely improving travel time reliability. Preliminary data shows statewide fatal and serious injury collisions declined 4.8% in the first half of 2008, compared to the first half of 2007, including an 8.6% drop in King County.	p. 15

2008 Congestion Report Highlights – Looking at 2007 data:

Travel Times Analysis: 38 High Demand Puget Sound Commutes	
Average travel times: Although many commuters experienced increasing travel times between 2005 and 2007, the rate of these increases has leveled off compared to prior years. Average travel times increased on 22 of the 38 high demand commute routes, with increases ranging from 1 and 4 minutes. Despite these marginal increases, average travel times improved by between 1 and 2 minutes on nine commutes during the same period and remained unchanged on seven.	pp. 18-21
95% reliable travel times: Between 2005 and 2007, 24 of the 38 high demand commutes saw increases in the 95% reliable travel time, with increases ranging from 1 minute (4 commutes) to 12 minutes (SeaTac to Seattle evening commute). Ten commutes saw reliable travel times improve between 1 and 4 minutes, while reliable travel times remained unchanged for four commutes.	pp. 19-21
Duration of congestion: The duration of congestion—defined as the period of time in which average speeds falls below 42 mph increased on 26 routes between 2005 and 2007. Again, although there is still an increasing trend, it is less severe than the increases observed from 2004 to 2006. Eight of the 38 commutes saw improvements, with congested periods decreasing by between 5 minutes (I-5 Seattle to Everett evening commute) and 55 minutes (SR 520 Seattle to Redmond evening commute), while one remained unchanged (SR 520 Bellevue to Seattle evening commute).	pp. 19-21
Percent of days when speeds were less than 35 mph–Stamp Graphs: The most visual evidence of peak period spreading can be seen in the graphs on pages 25-26. These "stamp graphs", comparing 2005 and 2007 data, show the percentage of days annually that observed speeds which fell below 35 mph (severe congestion).	pp. 24-26
Travel time comparison graphs: These bar graphs show four of the travel time performance indicators: travel times at posted speeds, travel time at maximum throughput speeds (51 MPH), average peak travel times, and 95% reliable travel times. For each of the 38 commutes general purpose (GP) and HOV travel times are shown. The graphs illustrate the travel time advantage HOV lane users have compared to GP lane users.	pp. 27-29
Travel Time Analysis: 14 Additional Puget Sound Commutes	
In addition to the 38 high demand commute routes, WSDOT tracks 14 other commutes in the central Puget Sound where data are available. With one exception, average travel times for these 14 routes have remained relatively flat from 2001 to 2007, and average speeds on these routes never fell below the bottom of the maximum throughput range (42 mph). The 95% reliable travel time is the only measure that is showing any indications of deterioration. For the seven evening commute routes, all of the 95% reliable travel times are trending upwards.	pp. 30-31
Travel Time Analysis: Spokane Commutes	
Increases in traffic demand on the two tracked Spokane commutes has resulted in moderate congestion and travel speed reductions during the afternoon commute, especially in the eastbound lanes. For the remainder of the commute, travel speed remains near what would be expected with free flow. Incidents remain the major cause of delay and congestion on the corridor as reflected in the increase in the 95% reliable travel time during the evening peak (+2 minutes/+13%).	p. 31
HOV Lane Performance	
HOV Lane Reliability Standard: The reliability standard requires the HOV lane to maintain a speed of 45 mph for 90% of the peak hour. Five of the seven HOV corridors in the peak direction during the evening peak hour have high enough traffic volumes that the corridors are below the HOV performance standard, and four of the seven corridors in the peak direction during the morning peak period are below the performance standard, matching the results from 2006. The graphs on pages 36-37 compare general purpose lane performance and HOV lane performance at the HOV lane reliability speed of 45 mph.	p. 32

2008 Congestion Report Highlights – Looking at 2007 data (continued)

HOV Lane Performance (continued)

Person Throughput: Most HOV lanes continue to be more effective at moving more people during peak periods than GP lanes. At the monitoring locations, the average HOV lane carries about 35% of the people on the freeway in the morning and evening peak periods. I-5 near Northgate is an example of how effective HOV lanes are at moving people: during the morning peak period the southbound HOV lanes on I-5 move about 14,400 people, or 44% of travelers on this section of highway, in only 21% of the vehicles. p. 33

HOV Lane Travel Times: Average travel times and 95% reliable travel times are almost always faster in HOV lanes than in general purpose (GP) lanes. Of the 48 2-person HOV lanes, 3+ HOV lanes, and Express lanes that run alongside the 38 key commute routes, 39 provide between one minute (I-90 Seattle to Issaquah evening commute) and 20 minutes (I-405 Bellevue to Tukwila morning commute) of savings in average travel time. Forty provide better reliability (95% reliable travel time) than their general-purpose lane counterparts. pp. 34-37

Throughput Productivity

Throughput productivity compares the observed average vehicle flow (vehicles per lane per hour – vplph) for a selected location to the observed highest average five minute vehicle flow at that location. The eight selected Puget Sound monitoring locations, shows marginal decreases in vehicle throughput from 2005 to 2007. I-405 at SR 169 in Renton continues to experience the greatest loss in throughput productivity, where congested conditions result in an approximate 50% reduction in vehicle throughput during the morning peak period from an optimal observed maximum flow rate of 1,970 vplph. pp. 38-39

Hours of Delay and Vehicle Miles Traveled

Statewide delay, relative to maximum throughput speeds and posted speeds, increased by 3% (+643,000 weekday hours of delay annually) and 4% (+1.8 million weekday hours of delay annually) respectively between 2005 and 2007. Delay relative to maximum throughput speeds cost Washington businesses and drivers roughly $617 million in 2007—$13 million more than in 2005 ($604 million). pp. 40-41

Delay on selected Puget Sound corridors: There was a slight increase in the overall daily vehicle hours of delay on the major freeway corridors in the central Puget Sound region between 2005 and 2007. During this time period, vehicle hours of delay on the central Puget Sound corridors increased by approximately 8% relative to the posted speeds (+3,200 vehicle hours of delay per day) and 12% relative to maximum throughput speeds (+2,400 vehicle hours of delay per day). VMT decreased slightly by 0.7% on five major freeway corridors in Puget Sound. p. 41

Before and After Analysis of Selected Projects: Moving Washington

Overview pp. 52-54

Add Capacity Strategically–Nickel and TPA: A study of 21 mobility projects funded by the 2003 and 2005 transportation funding packages save drivers an estimated 6,400 hours in combined travel time per day—a 10% improvement following construction. pp. 42-43

Add Capacity Strategically–Everett HOV: Southbound traffic during the morning peak saw an increase of average speed from 25 mph to free flow speeds (60 mph) in the two mile stretch north of 41st Street. General purpose travel times improved by 2-4 minutes heading southbound in the morning commute. During the evening peak, northbound general purpose traffic has seen benefits of 5-9 minutes through the eight mile stretch of I-5 between 128th St. and Marine View Drive. p. 44

Add Capacity Strategically–SR 202: This project greatly improved congestion and safety along SR 202 between SR 520 and Sahalee Way. There have been observed benefits of up to 20 minutes of travel time savings during peak hours between downtown Redmond and the Sammamish Plateau. pp. 44-45

Operate Efficiently–SR 167 HOT Lanes: Drivers paid an average of $1 to save 10 minutes of travel-time during the peak-hour commutes. Travel times for carpools and transit have been maintained. There is room in the HOT lane for additional carpool vehicles, transit, or toll-paying solo drivers. pp. 45-47

Operate Efficiently–SR 522 Signal Retiming: Nine signals were retimed along the SR 522 corridor from NE 153rd St. to 83rd Pl. NE. The SR 522 corridor carries an average of 60,000 vehicles per day. After retiming, peak period travel times generally decreased in both directions with the exception of westbound morning traffic, when travel times remained relatively unchanged during the morning peak period. pp. 47-48

Operate Efficiently–Direct Access Ramp Performance Update: Ten major HOV lane direct access ramps in the Puget Sound area have opened in the past few years. Ten more direct access ramps are planned. These direct access ramps save users between 1 to 8 minutes in travel times. p. 48

Operate Efficiently–Intelligent Transportation Systems: Active Traffic Management expands the use of ITS technology to dynamically manage traffic based on the prevailing conditions to help improve safety and traffic flow. pp. 49-50

Operate Efficiently–Incident Response Quarterly Update: In Quarter 3 of 2008, the statewide average clearance time was 12.6 minutes, up 6.8% from last quarter's historic low of 11.8 minutes. The average duration of the 74 over-90-minute lane-blocking incidents on the nine key corridors was 147 minutes during Quarter 3, 2008, and the annualized average for the three quarters of 2008 to date is 154 minutes, just below the target of 155 minutes. pp. 57-59

Manage Demand–Growth and Transportation Efficiency Centers: The GTEC program works with small businesses, neighborhoods and schools to help provide services and incentives to more than 235,000 commuters around the state who are not currently a part of a regional CTR program. The goal of the GTEC program is to reduce more than 14,000 drive-alone trips by 2011 that would otherwise be traveling on some of the state's most congested highways. Achieving this goal will mean a reduction of nearly 95 million annual VMT. p. 51

Special Report: Fuel price impacts on travel behavior

FIRST HALF 2008 DATA

Travel times improved on six major corridors

2008 Congestion Preliminary Report highlights

- High gas prices sent vehicle volumes lower, except during peak periods.
- Statewide fuel consumption fell 3.9%, or 350,000 gallons per day.
- Peak period travel times improved on six of seven key corridors.
- Average travel times improved by one to two minutes each way.
- Transit ridership increased as more commuters turned to buses.

Driving declines as gas prices reach record levels

National statistics show driving declined for the first time since the oil crises of the 1970s. Washington drivers are clearly cutting back, using 63 million fewer gallons of fuel in the first six months of 2008 compared to the first six months of 2007.

WSDOT worked with the University of Washington's Transportation Center (TRAC) to conduct a preliminary study of the effects of rising fuel costs on a sample of seven key corridors across the Puget Sound metropolitan region during the first six months of 2008.

High gas prices led many Puget Sound residents to limit their driving in early 2008.

Even as gas prices declined sharply amid the fall 2008 economic downturn, the skyrocketing gas prices of the spring and early summer presented a change in driver behavior that could result in temporary or lasting impacts. Daily and weekend vehicle volumes declined slightly as drivers trying to save money likely chose closer destinations, combined some trips and cancelled other outings.

Upon close examination, Puget Sound region travel trends are somewhat different than those found nationally. The region experienced two distinct trends: the increase in peak hour travel demand due to continued employment growth in the spring and the decrease in off-peak travel demand due to the significant increase in gas prices.

Statewide fuel consumption declined

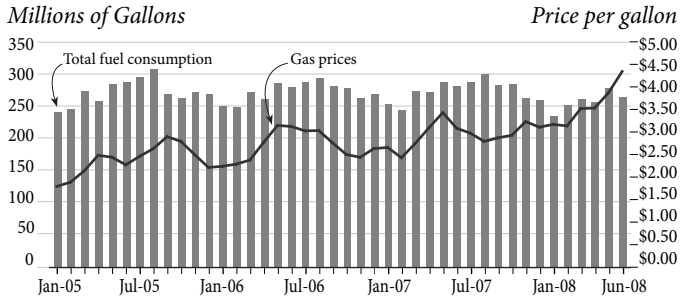
In millions of gallons sold; January-June 2007 & 2008

	Jan	Feb	Mar	Apr	May	Jun	Total
2007	254	245	274	271	287	281	1612
2008	235	252	261	257	279	265	1549
Change	-19	7	-13	-14	-8	-16	-63

Data Source: WSDOT Financial Planning and Analysis.

Gas prices and fuel consumption in Washington State

January 2005 - June 2008



Data Source: WSDOT Financial Planning and Analysis.

Confluence of events leads to improvement

King, Pierce and Snohomish Counties added 40,000 new jobs through June. The region's most highly traveled roads moved more drivers faster during peak periods, which contributed to the first overall improvement in peak period travel times since 2002. Four of the corridors experienced travel times improvements even as volume increased.

The improved travel times through some of the region's busiest corridors suggest that WSDOT's congestion relief strategies and their associated projects, combined with higher gas prices and rising transit ridership, had a positive effect on the performance of these corridors in the first six months of 2008.

Travel time reliability benefited from a reduction in major incidents, including an 8.6% drop in fatality and serious injury collisions on King County freeways and a 4.8% decline statewide in the first six months of 2008 compared to the same period in 2007.

FIRST HALF 2008 DATA

Travel times improved on six major corridors

While congestion remains heavy on several corridors, travel times on six of seven key Puget Sound corridors either improved or remained level for the first half of 2008, compared to 2007.

Four of seven major corridors saw increased traffic volumes during peak periods, yet six corridors experienced better travel times as traffic flow improved and disruptions declined.

The key trends include:

- Reliability: Most drivers experienced substantially faster commutes on the 80% and 95% reliable travel times, (a savings of one to nine minutes, depending on the route).
- More than half the 2008 peak travel times were even better than in 2005, even after years of worsening commute travel times.
- Off-peak volume on all corridors either declined or stayed the same.
- On weekends, five of seven corridors experienced a decline in volume, compared to 2007, while one corridor showed no change and one corridor experienced a slight increase.
- Overall weekday traffic volumes declined slightly in 2008 from volumes in 2006 and 2007 on four of seven corridors studied.
- Of the seven corridors reviewed, only, the Tukwila to Bellevue I-405 round-trip daily commute experienced slower travel times. The corridor experienced higher volumes and disruptions related to a major construction project at the I-90 Interchange.

Changes in average and reliable travel times: 2008 versus 2007 and 2005

Comparing January through June data for 2008, 2007, and 2005, travel times in minutes

		Average Travel Time			95% Reliable Travel Time		80% Reliable Travel Time	
		2008	Δ from 2007	Δ from 2005	2008	Δ from 2007	2008	Δ from 2007
Peak Direction - Morning Commutes								
I-5	Federal Way - Seattle	22.7	**-3**	+2	24.1	**-4**	22.8	**-5**
I-5	Everett – Seattle	33.0	**-4**	**-1**	54.2	**-9**	39	**-6**
I-405	Everett – Bellevue	33.2	**-4**	**-3**	53.9	**-7**	40.4	**-5**
I-405	Tukwila – Bellevue	33.5	0	+5	55.2	+2	44.1	+1
SR 167	Auburn – Renton	14.4	**-1**	**-1**	21.6	**-4**	16.4	**-2**
I-90	Bellevue – Seattle	13.0	**-1**	**-1**	18.2	**-5**	13.6	**-2**
SR 520	Bellevue – Seattle	13.6	**-1**	**-2**	20.0	**-3**	15.3	**-3**
I-90	Seattle – Bellevue	13.9	**-1**	0	21.2	**-1**	15.9	**-2**
SR 520	Seattle – Bellevue	16.5	**-1**	0	28.0	**-1**	21.4	**-2**
Off-Peak Direction Morning Commutes								
I-5	Seattle- Federal Way	22.7	0	0	24.1	0	22.8	0
I-5	Seattle – Everett	24.5	0	+1	29.4	+4	25.4	+1
I-405	Bellevue – Everett	23.6	0	0	24.8	**-1**	23.6	0
I-405	Bellevue - Tukwila	18.3	0	0	25.5	0	20.4	0
SR 167	Renton – Auburn	10.3	0	0	11.4	0	10.6	0
Peak Direction - Evening Commutes								
I-5	Seattle- Federal Way	28.0	**-2**	**-2**	42.7	**-8**	32.3	**-5**
I-5	Seattle - Everett	31.3	**-2**	**-2**	48.9	**-3**	37.7	**-3**
I-405	Bellevue - Everett	32.0	**-2**	0	49.2	**-2**	39.0	**-2**
I-405	Bellevue - Tukwila	28.1	+1	+3	45.2	+1	37.0	+3
SR 167	Renton - Auburn	13.4	**-1**	0	23.3	**-6**	16.5	**-2**
I-90	Bellevue - Seattle	18.1	**-2**	0	32.2	**-6**	23.7	**-4**
SR 520	Bellevue - Seattle	20.3	**-1**	**-2**	29.5	**-3**	25.6	**-1**
I-90	Seattle - Bellevue	12.2	**-2**	**-2**	16.5	**-6**	12.6	**-3**
SR 520	Seattle - Bellevue	14.0	**-1**	**-2**	22.3	**-3**	16.9	**-2**
Off-Peak Direction Evening Commutes								
I-5	Federal Way - Seattle	28.0	**-1**	0	42.7	**-5**	32.3	**-2**
I-5	Everett - Seattle	30.1	**-2**	0	48.4	**-8**	36.2	**-4**
I-405	Everett - Bellevue	25.2	**-1**	0	31.2	**-2**	27.7	0
I-405	Tukwila - Bellevue	17.4	0	**-1**	22.9	**-1**	19.5	0
SR 167	Auburn - Renton	10.2	0	**-1**	11.0	**-2**	10.4	0

Data Source: Washington State Transportation Center (TRAC).

Note: Average travel times in this analysis are calculated in a different manner than in the travel time analysis of annual 2005 and 2007 data on pages 20-21. This report looks at the average travel times for the entire peak period. The travel time analysis of 2005 vs. 2007 data examines travel times for the peak five minutes of each morning and evening peak period.
80% reliable travel time = The 80th percentile longest travel time out of 130 weekdays studied, which translates to an 80% likelihood (16 out of 20 trips) you will arrive at a destination on time.
95% reliable travel time = The 95th percentile longest travel time out of 130 weekdays studied, which translates to a 95% likelihood (19 out of 20 trips) you will arrive at a destination on time.

Special Report: Fuel price impacts on travel behavior

FIRST HALF 2008 DATA

Traffic volumes, gas consumption decline

Drivers reduce discretionary driving

The Puget Sound region appeared to be experiencing the effects of drivers cutting back mileage to save money as the $4.33 price of an average gallon of gas in June 2008 was 33% higher than in June 2007. Nationwide, the Federal Highway Administration estimated driving was down 2.9% over the first half of the year, or 42.9 billion vehicle miles traveled.

Driving levels experienced nearly universal declines in the Puget Sound region during non-peak periods and weekends, On weekdays, overall traffic volumes declined at 12 of 18 checkpoints reviewed, due to the drops in off-peak driving. On weekends, traffic volumes declined at 13 of 16 check points measured.

Off-peak driving is the best measure of discretionary driving because people are more likely to avoid trips, combine trips and choose closer destinations. Peak period driving includes mostly work-related trips, when such changes are more difficult.

Washington State drivers purchased 63.4 million fewer gallons of gasoline in the first six months of 2008 than in 2007, according to preliminary data, for a decline of 3.9%. While Puget Sound regional data was not available, statewide fuel consumption fell approximately 350,000 gallons per day and declined in every month except February, when the extra Leap Year day helped explain the increase.

Employment growth boosts peak volume

Peak period volumes increased, following continued growth in the economy. King County employers added about 32,200 jobs in the first six months of 2008 compared to the same period in 2007, according to data from the Washington State Employment Security Department. The 2.7% increase likely drew more drivers to the freeways. Also, employers in Snohomish and Pierce Counties added another 8,200 jobs combined, rising at rates of 2.1% and 1%, respectively. Peak volume rose 1-5% on five of seven corridors, compared to 2007. Job growth stalled in late spring as the national economic downturn grew.

Changes in traffic volumes: 2008 versus 2007 and 2006

Comparing January - June data for 2008, 2007, and 2006

		Average Daily Volumes				Average Peak Period Volumes			
		Weekday		Weekend		Average Peak Period Peak Direction (GP)		Average Peak Period Peak Direction (HOV)	
Corridor	Location and Direction	2007 vs. 2008	2006 vs. 2008	2007 vs. 2008	2006 vs. 2008	2007 vs. 2008	2006 vs. 2008	2007 vs. 2008	2006 vs. 2008
I-5	Des Moines NB	+0.5%	+2.0%	+0.5%	+2.5%	+4.0%	+2.0%	+0.2%	+0.9%
I-5	Des Moines SB	+0.5%	+2.5%	-0.5%	+2.5%	+4.0%	+5.0%	+2.1%	+5.2%
I-5	King/Snohomish Line NB	-0.5%	-0.0%	-2.0%	-1.0%	+1.0%	+3.5%	-2.2%	-3.9%
I-5	King/Snohomish Line SB	-1.0%	-1.0%	-1.5%	-0.5%	+5.5%	+2.5%	-0.4%	-0.1%
I-405	Kirkland NB	0.0%	+2.0%	-2.0%	+1.0%	+4.5%	+14.5%	-4.1%	-12.1%
I-405	Kirkland SB	-1.0%	-1.5%	-2.0%	+0.5%	+1.5%	0.0%	+0.2%	-3.5%
I-405	Newport Hills NB	+1.0%	-0.5%	+4.0%	+2.0%	+0.5%	-2.5%	+2.0%	+2.6%
I-405	Newport Hills SB	+1.0%	-0.5%	+0.5%	+1.5%	+2.0%	-0.5%	-3.6%	-3.1%
SR 167	Kent NB	-4.0%	-1.5%	-2.5%	-1.5%	-4.5%	-0.5%	-4.7%	-0.4%
SR 167	Kent SB	-5.0%	-3.0%	-1.0%	+1.0%	-2.0%	+0.5%	-3.0%	-3.6%
SR 167	Auburn NB	-2.0%	-0.5%	-2.0%	-0.5%	-3.5%	-1.0%	N/A	+3.5%
SR 167	Auburn SB	-3.5%	-0.5%	-1.5%	-0.5%	-4.0%	+1.5%	-1.9%	-4.6%
SR 520	Bellevue WB	+1.5%	+0.5%	-0.5%	+6.0%	+2.0%	+1.0%	-6.4%	-7.7%
SR 520	Bellevue EB	+1.0%	+0.0%	-1.0%	+6.5%	+4.0%	+3.0%	-5.8%	-6.4%
I-90	Bellevue/Issaquah WB	-0.5%	-1.0%	-1.5%	-0.5%	0.0%	-1.0%	-2.7%	-3.4%
I-90	Bellevue/Issaquah EB	-1.5%	-3.0%	N/A	N/A	0.0%	-1.0%	-5.1%	+1.7%
I-90	Floating Bridge WB	-1.0%	-2.5%	-3.0%	-5.0%	-0.5%	-1.5%	N/A	N/A
I-90	Floating Bridge EB	-0.5%	-1.5%	N/A	N/A	+1.5%	-0.5%	N/A	N/A

Data Source: Washington State Transportation Center (TRAC).

FIRST HALF 2008 DATA

Freeways working more efficiently, fewer collisions, improve reliability

Variety of factors causing improved travel times

The Puget Sound region experienced two distinct trends on four key routes— travel times improved from 2007 to 2008, while more vehicles used the roads during peak periods.

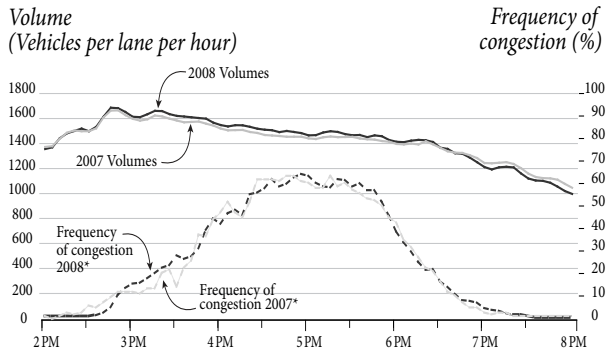
An analysis by the University of Washington Transportation Center (TRAC) reported travel times improved because vehicles were able to maintain marginally higher speeds during the peak periods.

The graph below, focusing on the I-5 evening commute northbound close to Northgate, shows a slight increase in volume while the frequency of congested conditions (when speeds drop below 42 miles per hour) remained steady and travel times improved by two minutes.

A variety of factors, including a slight decline in the number of cars trying to enter the freeway at key times, helped the corridor move vehicles more efficiently, thus allowing cars to travel faster.

Frequency of traffic congestion and average weekday traffic volumes - single corridor example

I-5 at NE 97th St., General purpose lanes, northbound
January - June, 2007 vs January - June, 2008



Data Source: Washington State Transportation Center (TRAC).
*Frequency of congestion refers to the percentage of days when speeds fell below 70% of posted speeds (42 mph)–the threshold for congestion.

Higher gas prices, improved incident response efforts, newly completed projects, declining fatality and serious injury collisions, and rising transit ridership also contributed to the improvement.

WSDOT will continue to examine these trends with full year data from 2008, including wide swings in gas prices, to look at the impact of high fuel costs and other factors on driving patterns and travel times.

Fatality and serious injury collisions decline

A drop in collisions, including fatality and serious injury collisions, is likely improving travel time reliability. For the first half of 2008, fatal and serious injury collisions declined by 5.1% to 9.1% statewide compared to the same period in 2005, 2006, and 2007, according to preliminary data. There were 1,010 fewer fatality and serious injury collisions statewide compared to 2007.

The decline was even sharper in King County, home to the majority of the corridor miles analyzed in this report. Fatality and serious injury collisions declined 8.6% to 15.2% compared to the first halves of 2005, 2006 and 2007. There were 31 fewer fatality and serious injury collisions on King County freeways compared to 2007.

One reason travel times improved was the reduction in non-recurrent delay, including incidents, weather and other events that contribute to commute times varying from day to day. Thus, the reduction in collisions, specifically the fatality and serious injury incidents, likely improved travel time reliability.

Reliable travel times on six of seven corridors improved as measured by the 80th percentile and 95th percentile longest travel times in the 130 weekday sample period. The measures suggest a 80% or 95% likelihood you will arrive on time. The 95% reliable travel times I-5 southbound from Everett to Seattle improved by nine minutes in the morning and eight minutes in the evening.

Collisions declined in early 2008

January - June, 2005-2008[1]

Fatal and serious injury collisions				
First half of	**State**	**% change from 2008**	**King County**	**% change from 2008**
2005	21,780	-9.1%	361	-8.6%
2006	22,318	-10.6%	389	-15.2%
2007	20,969	-4.8%	361	-8.6%
2008	19,959	N/A	330	N/A
Total collisions				
First half of	**State**	**% change from 2008**	**King County**	**% change from 2008**
2005	62,828	-8.5%	21,780	-9.1%
2006	62,454	-8.0%	22,318	-10.6%
2007	60,667	-5.3%	20,969	-4.8%
2008	57,465	N/A	19,959	N/A

Data Source: WSDOT Transportation Data Office and Traffic Office.
[1]2008 data is preliminary.

Special Report: Fuel price impacts on travel behavior

FIRST HALF 2008 DATA

Climbing transit ridership, congestion relief measures making impact

Transit use climbs, HOV lanes move more people

Transit agencies serving Seattle-area communities reported rising passenger boardings tied to record fuel prices. Buses, trains, and vanpools experienced greater demand as commuters sought new alternatives for reaching job sites.

Nearly 9,000 more people rode Sound Transit Express commuter buses daily in July 2008, compared to July 2007, an increase of 23%, with three of 19 routes experiencing surges of at least 50%.

Nationwide, transit ridership is significantly higher compared to 2007, but climbing at a lower rate than in the Puget Sound region. The American Public Transportation Association announced ridership increases of 3.4% and 5.2% in the first and second quarters of 2008 compared to 2007.

Sound Transit boardings increased

Figures for January 1 to June 30 of 2007 and 2008

	2007	2008	% Δ
ST Express Bus	5,179,487	5,882,975	14%
Sounder commuter rail	973,582	1,260,110	29%
Average weekday boardings[1]	46,038	53,063	15%
Total boardings	**6,153,069**	**7,143,085**	**16%**

Data Source: Sound Transit.

[1] Includes Tacoma Link boardings.

The 2008 increases in Washington followed an already rising trend of transit ridership statewide. Transit agencies provided a total of 196,206,269 trips in 2007, 6.3% higher ridership than in 2006.

In Seattle, with many commuter buses transporting 14% more people than a year ago, the sharp increases in transit ridership likely enabled HOV Lanes to move more commuters in fewer vehicles.

The data showed HOV lane vehicle volume declined at 13 of 17 checkpoints in the region at an average of about 20 to 30 cars per hour, or under 100 vehicles per peak period.

Possible conclusions include some carpool users are switching to transit and others are using general purpose lanes due to improved traffic flow. All but one of the major corridors reviewed showed increases in general purpose lane vehicle volumes.

The HOV section on pages 32-37 includes more information about HOV use and trends in 2007. There will be more analysis of transit use and HOV lane performance in the 2009 Congestion Report released next November.

Moving Washington: Congestion relief strategies being implemented statewide

While increased fuel prices have reduced volumes during off-peak hours, demand during peak congested periods is still increasing, which reduces the already limited capacity of the roadway. Committed to fighting congestion, WSDOT utilizes the three balanced strategies of *Moving Washington* to fight congestion— add capacity strategically, operate efficiently, and manage demand. These strategies are working. Projects being implemented statewide are providing the congestion relief intended as these examples demonstrate:

- **Add capacity strategically**: a before and after analysis of 21 selected Nickel and TPA congestion relief projects statewide, determined that these projects save drivers an estimated 6,400 hours in travel times per day – a 10% improvement following project completion as compared to conditions prior to construction, saving nearly $60 million each year.
- **Operating efficiently**: The Incident Response program has reduced average clearance times for 90+ minute incidents on key Puget Sound corridors by 7% during the second quarter of 2008 as compared to the same quarter in 2007.
- **Managing demand**: The Commute Trip Reduction program in the central Puget Sound made approximately 19,200 fewer vehicle trips each weekday morning in 2007 than they did when these work sites entered the program, reducing delay by an estimated 19% during the peak travel period on average mornings.

For more information on the benefits of WSDOT's congestion relief projects please see Before and After section on pages 42-51.

Gas price impacts merit further study

WSDOT will continue to assess the impact of high fuel prices on Seattle-area travel conditions. As gas prices fluctuate, further analysis will evaluate whether changes are temporary or long-lasting.

A recent separate study reported the Seattle region experienced one of the nation's largest improvements in congestion between June and August.

The 2009 Congestion Report will analyze a full year of congestion data on a broad array of routes in the September 30, 2009 *Gray Notebook*.

Measuring Delay and Congestion Annual Update

Introduction

Population growth, growing job markets, and an aging transportation infrastructure are stretching many of our roads and bridges beyond capacity. Fluctuating fuel prices and global climate concerns underscore the need for a more efficient transportation system. Washington's population has grown by more than 24% since 1992 with 3.5 million additional vehicles on our roads today. By 2030 the state's population will grow by another 2 million people, including 1 million more in the central Puget Sound region. According to the Office of Financial Management, between 2005 and 2007 alone, the core urban Puget Sound counties—King, Pierce, and Snohomish—saw a 4% increase in population (118,000 new residents). This increase in population has been driven by substantial economic growth and prosperity in the region. The impact of this growth has been increased demand on our roadways, resulting in congestion.

The growth in travel demand, particularly during peak periods, consumes the limited capacity of the highway system, leading to increased congestion. *Recurring congestion* occurs during peak travel periods for a simple reason—the number of vehicles trying to use the highway system exceeds the available capacity. *Non-recurring congestion*—congestion resulting from weather, roadway construction, collisions, vehicle breakdowns, etc.—further reduces the operating efficiency of the highway system.

Moving Washington: WSDOT's balanced strategies to fight congestion

Faced with these realities, WSDOT utilizes three balanced strategies to fight congestion— add capacity strategically, operate efficiently, and manage demand. By strategically adding capacity, WSDOT targets bottlenecks and chokepoints in the transportation system. However, because of limited resources, WSDOT understands that adding capacity cannot be the only solution for solving the congestion problem. That is why WSDOT uses operational strategies to maximize the efficiency of the existing transportation system (operate efficiently). Added to this, WSDOT manages demand by encouraging and providing alternatives to the traveling public between and within modes of travel. *Moving Washington* is explained in greater detail on pages 52-54.

HOV lanes are a vital part of the Puget Sound highway system by efficiently moving more people in fewer vehicles more quickly than adjacent general purpose lanes during peak periods.

Overview: 2008 Congestion Report examines 2007 calender year data

The annual congestion report examines 2007 calendar year data focusing on the most travelled commute routes in the central Puget Sound region, and where data are available. The report examines selected commute routes, so it is not representative of the entire highway system. The Congestion Report's detailed analysis shows where and how much congestion occurs, and whether it has grown on the selected commute routes. As a special feature of this year's report, WSDOT looks at the effects of surging fuel prices during the first half of 2008. An overview of specific performance measures used in the report are explained on pages 55 and 56.

2008 Congestion Report Highlights– Looking at 2007 Data:

Increases in peak-period travel times are leveling off in 2007, with nine key commute routes seeing improvements.

Overall, HOV lanes continue to outperform GP lanes in person throughput and peak period travel times.

Relative to optimal flow speeds, statewide travel delay increased by 2.6% in 2007 compared to 2005.

A study of 21 Nickel and TPA mobility projects shows a 10% improvement in travel times following construction.

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Measuring Delay and Congestion: Annual Update – 2007 Data

Travel Time Analysis

The state highway system connects our communities with 20,000-plus lane-miles of roadway. Most of these statewide routes do not experience recurring congestion. WSDOT tracks congestion measures for 52 commutes in Puget Sound, including the 38 high demand commutes that have traditionally been the focus of the *Gray Notebook's* annual congestion update. New to this year's congestion annual update, WSDOT reports on HOV lane travel times, and it takes a look at the additional 14 routes that make up the 52 tracked Puget Sound commutes. Apart from the central Puget Sound, WSDOT also reports on two major commutes in Spokane.

WSDOT uses the following performance measures as part of its travel time analysis for general purpose lanes:

- Average travel time;
- 95% Reliable travel time;
- Vehicle Miles Travelled (for traffic volume);
- Average duration of congestion;
- Maximum throughput travel time index (MT^3I).

These measures are reported in the travel time tables on pages 20-21, and definitions can be found on page 55. These measures also include the percent of days when speeds fell below 35 mph, which WSDOT defines as severe congestion (see stamp graphs on pages 40-41). This report compares calendar year 2007 data with 2005 data.

Average travel times improve or stay the same on 24 of the 52 tracked Puget Sound commutes in 2007

Average peak period travel times improved or stayed the same for 24 of the 52 Puget Sound commutes between 2005 and 2007. Of the 38 most congested commutes, nine saw improvements in average travel times, and 11 saw improvements in 95% reliable travel times. This is the first time the *Gray Notebook* has reported improvements for a large portion of the tracked Puget Sound commute routes. WSDOT will continue to track travel times to see if condition continue to improve. For more information on travel time changes during the first half of 2008, please see pages 12-16.

Economic growth in the central Puget Sound remains strong but increases in travel times have leveled off in 2007

Although many commutes still showed increasing travel time measures between 2005 and 2007, the rate of these increases has leveled off from comparably higher increases across almost all measures in 2004 to 2006. Despite the leveling off of travel time increases, the central Puget Sound, which encompasses Pierce, King, Snohomish and Kitsap counties, added 122,500 people[1] and 115,448 jobs[2] between 2005 and 2007, considerably more than were added between 2004 and 2006 (107,000 residents[1] and 91,000 jobs[2]). Meanwhile, vehicle miles traveled for the 52 tracked commute routes dropped across the board during peak periods, with only one route remaining at its 2005 volume.

The explanation for this decrease in volume during peak travel times is counter-intuitive: the drop in vehicle miles traveled is a result of more cars on the highway. As more cars join the stream of vehicles on the road, speeds drop and fewer cars are able to actually travel through a corridor. The inverse of this trend is discussed on page 14, which shows peak period travel volumes increasing in 2008 as travel times improved.

Growth in average travel times on the 38 key commute routes appears to have slowed

From 2005 to 2007, the surge in growth in average travel times appears to have begun leveling out. The range of increases for average travel times was 2%-12%, a modest rate of growth compared to last year's increases for 2004 vs. 2006, which ranged from 2%-22%. Between 2004 and 2006, thirteen of the 38 high demand

Trends on other modes, 2005 and 2007

Transit boardings increasing

Between 2005 and 2007, weekday boardings on Sounder train routes increased 76%, from roughly 1.2 million to 2.1 million. Meanwhile, Sound Transit bus ridership increased from 9.6 million to 12.2 million boardings, about a 26% increase. King County Metro ridership increased to 110.6 million from 99 million, a 12% increase.

Vanpool experiencing a growth in ridership

Vanpool ridership data for the Central Puget Sound region also includes Whatcom and Island counties. From 2005 to 2007, population in these six counties increased by 3.5%, while vanpool ridership increased by 21%, or about 3,000 people per day.

HOV lanes

The change in HOV lane vehicle volumes from 2005 to 2007 varied from location to location, ranging from -3% to +5%. Travel time changes in HOV lanes were commensurate with travel time changes in GP lanes. More information on changes in HOV lane performance including changes in person throughput is available on pages 32-37.

Note: KCM data is all ridership throughout the week, including weekends. Sound Transit and Sounder numbers reflect weekday ridership throughout the day. These numbers can be refined to be more "apples-to-apples" with our peak-period-based measures.

[1] Washington State Office of Financial Management.

[2] Puget Sound Regional Council and Washington State Employment Security Department's (ESD) Quarterly Census of Employment and Wages

Travel Time Analysis of the 38 High Demand Commute Routes

Average travel times: biggest changes between 2005 and 2007

Largest percent increase in average travel time	Bellevue to Seattle I-90 evening commute	+12% / 3 minutes	-3% in VMT
Largest increase in average travel time in minutes	Tukwila to Bellevue morning commute	+11% / 4 minutes	-5% in VMT
Largest percent improvement in average travel time	Issaquah to Bellevue morning commute	-11% / -2 minutes	-1% in VMT
Largest improvement in average travel time in minutes	Everett to Bellevue morning commute	-4% / -2 minutes	-3% in VMT
	Lynnwood to Bellevue morning commute	-5% / -2 minutes	-2% in VMT

routes posted percent increases above this year's highest increase of 12%. Similarly, the actual change in average travel times was more modest in 2005 to 2007. Across the 38 routes, the change in average travel time from 2005 to 2007 ranged from -2 to 4 minutes, while the change from 2004 to 2006 was -1 to 7 minutes.

95% reliable travel time increases are consistent with increases seen last year

The 95% reliable travel time performance measure relates to the amount of time necessary to make it to a destination on time on an average of 19 out of 20 work days. The changes in 95% reliable travel times from 2005 to 2007 were consistent with changes seen between 2004 and 2006. Across the 38 routes, the change in 95% reliable travel time from 2005 to 2007 ranged from -5 to 11 minutes, the same range that occurred in 2004 to 2006.

The largest increase, both in number of minutes and percent increase, was on the Sea-Tac to Seattle evening commute, where the reliable travel time worsened by 41%, or 11 minutes. This increase was much higher than other increases this year, which ranged from 2%-21%. In last year's analysis, increases in reliable travel time ranged from 4%-30%, with five routes surpassing the 21% level (but no routes exceeding the 41% increase posted by the *Sea-Tac to Seattle evening commute* between 2005 and 2007). See www.wsdot.wa.gov/Traffic/Seattle/TravelTimes/reliability/ to calculate the 95% Reliable Travel Time for your commute.

Duration of congestion increased on most routes, but has slowed

The duration of congestion—defined as the period of time in which average speeds fall below 42 mph—is increasing on 26 routes. Again, although there is still an increasing trend, it is less severe than the increases observed from 2004 to 2006. From 2004 to 2006, 31 out of 38 commute routes had increases in duration. Nine of these 31 routes had duration increases of over one hour.

Duration of congestion[1]: biggest changes 2005 vs. 2007

Route with longest duration	Bellevue to Tukwila evening commute	5 hr. and 35 min. total duration (15 min. increase)
Route with largest increase in duration	SeaTac to Seattle morning commute	1 hr. 30 min. increase (4 hr. and 5 min. total duration)
Route with largest decrease in duration	Seattle to Redmond evening commute	55 min. decrease (2 hr. and 15 min. total duration)

[1] Duration of congestion measures the period of time in which average speeds fall below 42 mph (70% of the posted speed limit).

MT³I facilitates comparisons between different routes

When comparing travel times, the maximum throughput travel time index (MT³I) measure enables WSDOT to make "apples to apples" comparisons of travel times between routes of varying distances. For instance, the *Bellevue to Seattle I-90 evening commute* and the *Issaquah to Seattle evening commute* both have average travel times of 28 minutes. However, the first route is 11 miles long and the second is 15; using average travel times alone would not be a very meaningful comparison. By contrast, the MT³I value incorporates the expected travel time under maximum throughput conditions, which takes into account the length of the route. An MT³I of 1.0 would indicate a highway operating at maximum efficiency, and anything above that is working at lower efficiency due to congestion. As the MT³I value increases, travel time performance deteriorates. In this example, the *Bellevue to Seattle I-90 evening commute* has an MT³I of 2.23, which means that the commute route takes 123% longer than the time it would normally take at maximum throughput speeds. The *Issaquah to Seattle evening commute* has an MT³I of 1.54, which means that the commute will take 54% longer than the commute route would take at maximum throughput speeds. Therefore, the *Bellevue to Seattle I-90 evening commute* is considered to be the "worse" commute of the two.

95% Reliable travel times: Biggest changes between 2005 and 2007

Largest percent increase in 95% reliable travel time	SeaTac to Seattle evening commute	+41% / 11 minutes	-4% in VMT
Largest increase in 95% reliable travel time in minutes	SeaTac to Seattle evening commute	+41% / 11 minutes	-4% in VMT
Largest percent improvement in 95% reliable travel time	Bellevue to Seattle SR 520 morning commute	-12%/ -3 minutes	-3% in VMT
Largest improvement in 95% reliable travel time in minutes	SeaTac to Seattle morning commute	-10% / -4 minutes	-4% in VMT

Measuring Delay and Congestion: Annual Update – 2007 Data

Travel Time Analysis of the 38 High Demand Commute Routes (continued)

Morning commutes: changes in travel time performance on the 38 high demand commutes

2005 A.M. peak vs. 2007 A.M. peak

Route/Route Description	Peak time	Length (Miles)	Travel Time (minutes) At Peak Efficiency	Travel Time (minutes) At Posted Speed	Average Peak Travel Time, Based on Peak Time (minutes) 2005	2007	%Δ	95% Reliable Travel Time (in minutes) 2005	2007	%Δ	Ratio of Peak Travel Time to Maximum Through-put Travel Time MT³I 2005	2007	Traffic Volume Peak Period VMT %Δ	Duration of Congestion (hours and minutes that average speed falls below 70% of posted speeds) 2005	2007	%Δ
To Seattle																
I-5–Everett to Seattle	7:25 AM	23.7	28	24	46	47	+2%	68	76	+12%	1.65	1.69	-4%	2:15	2:20	+0:05
I-5–Federal Way to Seattle	7:00 AM	21.8	26	22	43	47	+9%	59	65	+10%	1.68	1.84	-4%	2:25	3:20	+0:55
I-90/I-5–Issaquah to Seattle	7:40 AM	15.5	18	15	26	25	-4%	37	37	0%	1.43	1.37	-2%	1:00	1:10	+0:10
SR 520/I-5–Redmond to Seattle	7:40 AM	14.8	17	15	22	22	0%	33	31	-6%	1.27	1.27	-2%	0:20	0:10	-0:10
I-5–SeaTac to Seattle	7:35 AM	12.9	15	13	25	27	+8%	40	36	-10%	1.64	1.77	-4%	2:35	4:05	+1:30
I-405/I-90/I-5–Bellevue to Seattle	8:15 AM	10.7	13	11	16	17	+6%	24	29	+21%	1.28	1.36	-3%	*	0:40	+0:40
I-405/SR 520/ I-5–Bellevue to Seattle	7:50 AM	10.5	12	10	18	18	0%	26	23	-12%	1.46	1.46	-3%	1:15	1:20	+0:05
To Bellevue																
I-5/I-405–Everett to Bellevue	7:25 AM	23.4	28	23	51	49	-4%	79	78	-1%	1.85	1.78	-3%	2:25	2:35	+0:10
I-405–Lynnwood to Bellevue	7:35 AM	16.0	19	16	41	39	-5%	64	62	-3%	2.18	2.08	-2%	2:40	2:50	+0:10
1-405–Tukwila to Bellevue	7:45 AM	13.5	16	13	38	42	+11%	54	58	+7%	2.40	2.65	-5%	3:40	4:10	+0:30
I-5/I-90/I-405–Seattle to Bellevue	8:40 AM	10.6	12	11	17	17	0%	25	25	0%	1.37	1.37	-1%	1:10	1:35	+0:25
I-5/SR 520/ I-405–Seattle to Bellevue	8:35 AM	10.1	12	10	22	23	+5%	31	33	+6%	1.86	1.94	-2%	2:35	2:50	+0:15
I-90/I-405–Issaquah to Bellevue	7:45 AM	9.5	11	9	19	17	-11%	26	26	0%	1.71	1.53	-1%	1:55	2:40	+0:45
SR 520/I-405–Redmond to Bellevue	7:55 AM	7.1	8	7	9	9	0%	10	10	0%	1.07	1.07	-1%	*	*	N/A
To Other Locations																
I-405–Bellevue to Tukwilla	7:40 AM	13.5	16	13	21	22	+5%	30	31	+3%	1.33	1.39	-4%	0:30	0:40	-0:10
SR 167–Auburn to Renton	6:25 AM	9.8	12	10	17	18	+6%	25	30	+20%	1.48	1.56	-6%	1:55	2:35	+0:40
I-5/I-90–Seattle to Issaquah	8:40 AM	15.7	18	16	20	20	0%	26	27	+4%	1.08	1.08	-1%	*	*	N/A
I-5/SR 520–Seattle to Redmond	8:35 AM	14.7	17	15	26	27	+4%	36	37	+3%	1.50	1.56	-2%	1:50	2:25	+0:35

Data Source: WSDOT Traffic Operations and the Washington State Transportation Center (TRAC) at the University of Washington.

Note: An asterisk (*) indicates that speeds did not fall below 70% of posted speed on a route.

2005 figures have been recalculated since their last publication in the 2006 annual congestion update, using a more refined data quality control process.

Maximum throughput travel time index (MT³I) increases on 22 of the 38 commute routes

The MT³I is a measure that was developed by WSDOT to compare peak travel times to travel times observed at maximum throughput speeds: speeds that allow the largest number of cars to pass along a route at one particular time. For more information on WSDOT's use of maximum throughput as a basis for measuring congestion, please see the gray box on page 19. As the MT³I goes higher than 1.0, the efficiency of the road drops: traffic is moving at speeds that are lower than maximum throughput levels, and congestion increases.

The route with the highest MT³I was the *Tukwila to Bellevue morning commute*, at 2.65. This means that in peak congestion, it takes 2.65 times longer to complete this trip than it would when traveling at 85% of the posted speed.

Volumes drop or remain steady

Between 2005 and 2007, traffic volumes during the peak period decreased on 37 of the 38 most congested Puget Sound routes, while one remained unchanged. The overall trend is about a 2% drop in volumes. Some locations on eastside routes do show a growth in spot volumes (Issaquah and Redmond). However, when those spots are weighed in with the rest of the route, there

Travel Time Analysis of the 38 High Demand Commute Routes (continued)

Evening commutes: changes in travel time performance on the 38 high demand commutes

2005 P.M. peak vs. 2007 P.M. peak

Route/Route Description	Peak time	Length (Miles)	Travel Time (minutes) At Peak Efficiency	Travel Time (minutes) At Posted Speed	Average Peak Travel Time, Based on Peak Time (minutes) 2005	2007	%Δ	95% Reliable Travel Time (in minutes) 2005	2007	%Δ	Ratio of Peak Travel Time to Maximum Through-put Travel Time MT³I 2005	2007	Traffic Volume Peak Period VMT %Δ	Duration of Congestion (hours and minutes that average speed falls below 70% of posted speeds) 2005	2007	change (min.)
From Seattle																
I-5–Seattle to Everett	4:20 PM	23.7	28	24	44	43	-2%	68	63	-7%	1.58	1.54	-2%	2:50	2:45	-0:05
I-5–Seattle to Federal Way	4:10 PM	22.1	26	22	36	37	+3%	54	55	+2%	1.38	1.42	-1%	1:45	1:50	+0:05
I-5–Seattle to SeaTac	4:10 PM	12.9	15	13	18	20	+11%	25	30	+20%	1.18	1.31	-1%	*	0:05	+0:05
I-5/I-90/I-405–Seattle to Bellevue	5:30 PM	10.6	12	11	18	17	-6%	31	29	-6%	1.45	1.37	-3%	0:50	*	-0:50
I-5/SR 520/I-405–Seattle to Bellevue	5:30 PM	10.1	12	10	20	19	-5%	32	29	-9%	1.69	1.60	-3%	2:45	2:30	-0:15
I-5/SR 520–Seattle to Redmond	5:35 PM	14.7	17	15	29	29	0%	42	40	-5%	1.68	1.68	-3%	3:10	2:15	-0:55
I-5/I-90–Seattle to Issaquah	5:30 PM	15.7	18	16	23	22	-4%	35	33	-6%	1.25	1.19	-1%	*	*	N/A
From Bellevue																
I-405/I-5–Bellevue to Everett	4:30 PM	23.4	28	23	42	45	+7%	60	63	+5%	1.53	1.64	-3%	2:55	3:10	+0:15
I-405–Bellevue to Lynnwood	5:20 PM	16.0	19	16	31	34	+10%	43	52	+21%	1.65	1.81	-3%	3:00	3:15	+0:15
1-405–Bellevue to Tukwilla	4:20 PM	13.5	16	13	31	34	+10%	42	46	+10%	1.96	2.15	-4%	5:20	5:35	+0:15
I-405/I-90/I-5–Bellevue to Seattle	5:20 PM	10.7	13	11	25	28	+12%	40	45	+13%	1.99	2.23	-3%	3:05	3:55	+0:50
I-405/SR 520/ I-5–Bellevue to Seattle	5:30 PM	10.5	12	10	26	26	0%	34	37	+9%	4.00	2.11	-3%	4:35	4:35	0:00
I-405/I-90–Bellevue to Issaquah	5:30 PM	9.3	11	9	17	18	+6%	22	24	+9%	1.55	1.65	0%	3:00	3:15	+0:15
I-405/SR 520–Bellevue to Redmond	5:35 PM	6.8	8	7	14	15	+7%	22	24	+9%	1.76	1.88	-3%	3:25	3:20	-0:05
To Other Locations																
I-5–Everett to Seattle	3:35 PM	23.7	28	24	38	41	+8%	54	62	+15%	1.37	1.47	-3%	2:05	2:40	+0:35
I-90/I-5–Issaquah to Seattle	5:20 PM	15.5	18	15	26	28	+8%	44	49	+11%	1.43	1.54	-3%	0:35	1:25	+0:50
SR 520/I-5–Redmond to Seattle	5:25 PM	14.8	17	15	36	37	+3%	59	62	+5%	2.07	2.13	-4%	3:45	4:05	+0:20
SR 167–SeaTac to Seattle	5:20 PM	12.9	15	13	20	21	+5%	27	38	+41%	1.31	1.38	-4%	0:10	1:55	+1:45
I-5–Renton to Auburn	4:20 PM	9.8	12	10	18	19	+6%	30	34	+13%	1.56	1.65	-3%	2:55	3:00	+0:05
I-405–Tukwilla to Bellevue	5:20 PM	13.5	16	13	21	20	-5%	28	27	-4%	1.33	1.26	-3%	0:50	0:20	-0:30

Data Source: WSDOT Traffic Operations and the Washington State Transportation Center (TRAC) at the University of Washington.

Note: An asterisk (*) indicates that speeds did not fall below 70% of posted speed on a route.

2005 figures have been recalculated since their last publication in the 2006 annual congestion update, using a more refined data quality control process.

is an overall drop. Only one route sustained its volume, the Bellevue to Issaquah evening commute (0%). The biggest drop was posted on the Auburn to Renton morning commute (-6%).

At first glance, it seems paradoxical that volumes are dropping during the peak hour while travel times are worsening on the majority of routes. Some of this is explained by the physical limitations of the highway. As more cars try to access the highway during peak times, crowding caused by these additional vehicles causes slower travel times and allows fewer cars actually traverse the route.

The reverse phenomenon can be seen during the first 6 months of 2008 on pages 12-16. During this time, rising gas prices in the first half of 2008 lead to a decrease in single occupancy vehicles on the road. This contributed to improved travel times and higher volumes during very congested peak periods, as vehicles are able to move more freely due to less crowding.

Travel Time Analysis of the 38 High Demand Commute Routes (continued)

Eastbound evening commutes from Seattle improve

Four commutes head eastbound across Lake Washington in the evening. All four routes show a dropping or steady average travel time, improved reliability, and decreased duration of congestion. Volume drops on these routes ranged from -1% to -3%. Three of the four commutes also showed improvement in severe congestion (see stamp graphs on page 25-26). Also, the duration of congestion on the Seattle to Bellevue I-90 evening commute went from 50 minutes to 0, indicating that the route is performing at non-congested speeds. Morning commutes in to Seattle from the east show changes of -1 minute to 1 minute in average travel time, and did not experience significant increases across the other measures.

Job growth in Seattle was modest from 2005 to 2007, only increasing by 13,066 jobs (2.8%). However, population growth was strong to the east of Seattle, growing by 15,160 people (9.6%). Sound Transit bus routes heading eastbound out of Seattle had a ridership increase of 22.7% over this period, while King County Metro buses traveling in the same direction experienced a 12% ridership growth.

It is possible that the increase in population was absorbed by transit, leading to less use of this commute route by single occupancy vehicles. And, given the minimal employment growth in Seattle, it is also possible that the majority of new residents in the eastern part of the county did not take jobs in Seattle.

Tukwila to Bellevue morning commute ranks worst of all commutes monitored

Commuters on the *Tukwila to Bellevue morning commute* experience the most congested conditions of the commutes measured. The average travel time for this commute at the peak travel time is 42 minutes, which is more than two and a half times as long as the peak efficiency travel time of 16 minutes. The result is that this commute has the highest MT^3I ratio of any of the 38 commute routes at 2.65. Between 2005 and 2007, the four minute increase from 38 to 42 minutes in travel time was the biggest increase observed in the central Puget Sound. Interestingly, volume dropped by -5% for the same time period on this route. Construction along this commute route is likely influencing travel time performance. The duration of congestion for this route is 4 hours 10 minutes, which represents the longest duration of congestion for any morning commute.

Not surprisingly, the return home commute (Bellevue to Tukwila evening commute) is very congested as well. On the average weekday, speeds fall below 70% of the posted speeds for 5 hours 35 minutes during the evening commute, which represents the longest duration of congestion for any commute route in the central Puget Sound. Volume decreased -4% for this route from 2005 to 2007.

Morning and evening commutes worsen for commuters living south of Seattle

The two evening commutes to Federal Way and Sea-Tac heading southbound on I-5 out of Seattle both worsened for average travel time and 95% reliable travel time, while worsening only mildly on duration (5 minutes increase on both). Volumes on both of these routes dropped marginally by -1%. Similarly, morning commutes into Seattle from Federal Way and Sea-Tac worsened across all measures, including the percent of days with severe congestion (see stamp graphs on page 25), and had drops in volume of -4%

Transit and train services running along these routes are also showing substantial increases: boardings on Sound Transit buses heading south from Seattle increased by 22%, and boardings on Sounder trains for cities south of Seattle increased 76%.

Job growth in Seattle was modest from 2005 to 2007, increasing by 13,066 jobs (2.8%). By contrast, areas to the north and south of Seattle experienced greater increases in employment (see table on p. 23).

While population growth in the areas immediately south of Seattle grew by a relatively small by 8,190 people (2.7%), the counties further south showed greater population expansion: Pierce County gained 34,600 new residents (4.6%), and Thurston County gained 13,900 new residents (6.2%).* While it is not entirely certain that a substantial proportion of these new residents are working in Seattle, it is one possible explanation for the increase in traffic into and out of Seattle on southern I-5 commute routes.

Evening commutes out of Bellevue worsen on all measures

The seven evening commutes out of Bellevue showed a near-uniform worsening across all types of measures. Average travel time increased on six commutes and stayed steady on the seventh, 95% reliable travel time worsened on all seven commutes, and average duration increased on five commutes, stayed steady on one, and improved by only five minutes on the last. The "stamp graphs" on pages 25-26, show severe

* An analysis by the Puget Sound Regional Council showed that the average distance to work for a resident of Tacoma/Pierce Co. grew by 13% from 1999 to 2006, from 10.8 miles to 12.3 miles. An analysis of Census data (American Community Survey Public Use Microdata Sample) by the Thurston Regional Planning Council found that the number of commuters who live in Thurston County and work in King County increased from about 3,000 to about 5,000 from 2005 to 2007.

Travel Time Analysis of the 38 High Demand Commute Routes (continued)

August 2007 construction on I-5 did not affect annual average travel times

A review by University of Washington's Transportation Research Center found that the August 2007 closure on I-5 did not have a significant effect on the annual average travel time. The annual average for the morning northbound commute on I-5 into Seattle was increased by about 20 seconds, and the annual average for the same commute in the evening was decreased by about 15 seconds. These changes are not enough to cause any major effects to the annual average travel time, and therefore data from the days of the closure is being kept in the annual average travel times. Construction during the 14-day closure, which was completed ahead of time, replaced worn expansion joints and repaved the highway with durable polyester concrete which will extend the life of that section of I-5 by another 30 years. More information about the direct effects of the project on traffic is available in the September 30, 2007, *Gray Notebook*, p. 79.

Population and employment change at selected Puget Sound locations
2005 vs. 2007

	Population			Number of Jobs		
	2005	2007	% Δ	2005	2007	% Δ
Seattle	573,000	586,200	+2.30%	465,689	478,755	+2.81%
Bellevue	115,500	118,100	+2.25%	113,306	124,347	+9.74%
Southwestern King County cities						
Des Moines	28,960	29,090	+0.45%	5,553	5,539	-0.25%
Federal Way	85,800	87,390	+1.85%	28,818	31,254	+8.45%
Kent	84,920	86,660	+2.05%	60,258	64,977	+7.83%
Renton[1]	56,840	60,290	+6.07%	48,304	51,637	+6.90%
SeaTac	25,140	25,530	+1.55%	26,045	28,746	+10.37%
Tukwila	17,110	18,000	+5.20%	40,628	46,972	+15.62%
Total	**298,770**	**306,960**	**+2.74%**	**209,607**	**229,125**	**+9.31%**
Eastern King County cities						
Issaquah[1]	17,060	24,710	+44.84%	17,482	19,209	+9.88%
Kirkland	45,740	47,890	+4.70%	31,648	32,398	+2.37%
Newcastle	8,890	9,550	+7.42%	1,206	1,724	+43.00%
Redmond	47,600	50,680	+6.47%	82,073	85,775	+4.51%
Sammamish	38,640	40,260	+4.19%	4,304	5,054	+17.43%
Total	**157,930**	**173,090**	**+9.60%**	**136,713**	**144,160**	**+5.45%**
Snohomish County						
Snohomish	655,800	686,300	+4.65%	216,811	247,670	+14.23%

Source: Puget Sound Regional Council and Washington State Office of Financial Management.
[1] Part of the population growth in Renton and Issaquah was due to annexation, not an actual increase in the number of people living in the area. Renton gained 949 resident from annexation, and Issaquah gained 3,712 residents.

congestion occurring on more days, and starting earlier, on six routes, while staying steady on the seventh. Volume either dropped or stayed steady on these routes, experiencing a -4% to 0% change. Morning trips in to Bellevue show no pattern in the measures, worsening on some and improving or staying steady on others.

Between 2005 and 2007, employment in Bellevue increased by 11,000 jobs, an increase of 9.7%. Transit and train services running along this route are also showing substantial increases. This increase implies that there has been an increase in workers leaving Bellevue. Boardings on Sound Transit bus routes leaving Bellevue in all directions increased by 23.9% during this time, and evening time King County Metro boardings on westbound afternoon trips across I-90 and SR 520 increased 18.5%.

In addition to increased employment, Bellevue also had a complicating factor of construction. In March 2007, the South Bellevue project from 112th Ave to SE 8th St began on I-405. I-405 Kirkland Nickel Stage One Project started in December 2005 and ended January 2008.* All seven routes run at least in part along I-405, so these construction pressures likely directly affected travel times on the routes.

Duration patterns are more balanced between morning and evening commutes out of Seattle

In the past, across all routes, duration has typically been shorter on the morning routes and longer on the evening routes. In 2007, evening duration was clearly longer than morning duration on the seven Bellevue work site commutes. Removing the lowest and highest values, morning durations ranged from one hour and 35 minutes to two hours and 50 minutes, while evening durations ranged from three hours and 15 minutes to four hours and 35 minutes.

However, many of the seven Seattle-worksite morning routes gained in duration, while the corresponding evening routes generally dropped or

* The ongoing Renton Stage 1 Project began in September 2007.

Travel Time Analysis of the 38 High Demand Commute Routes (continued)

stayed steady. Again removing the lowest and highest values, evening durations on Seattle-based commutes ranged between five minutes and two hours and 30 minutes, while morning durations ranged between 40 minutes and three hours and 20 minutes.

Evening trips into Seattle are worsening

Five of the six evening commutes into Seattle show an increase in average travel time and duration, with the sixth (*Bellevue to Seattle SR 520 evening commute*) holding steady. All six show worsened reliability, and the stamp graphs for all six show severe congestion beginning earlier in the day and occurring more frequently. At the same time, volume on the roads dropped from -3% to -4%. These increases are all consistent with patterns found in last year's analysis.

Between 2005-2007, the cities surrounding Seattle gained jobs. Employment in cities south of Seattle increased by 19,500 jobs (9.3%), north of Seattle in Snohomish county increased by 30,000 jobs (14.2%), and in Bellevue and other cities to the east of Seattle by 11,000 jobs (9.7%) and 7,400 jobs(5%), respectively. Population in Seattle only grew 2.3% during this period. Sound Transit routes heading in to Seattle posted a 19.7% gain in boardings. King County Metro routes heading in to Seattle from these directions increased 17.8%.

All three evening commutes into Bellevue, meanwhile, improved on average travel time, reliability, duration, and severe congestion (as represented in the stamp graphs on pp. 25-26).

It appears that employment is growing around Seattle and not in the city itself. More people are commuting back into Seattle in the evenings, resulting in worsening commutes. Some of this increase is being absorbed by buses.

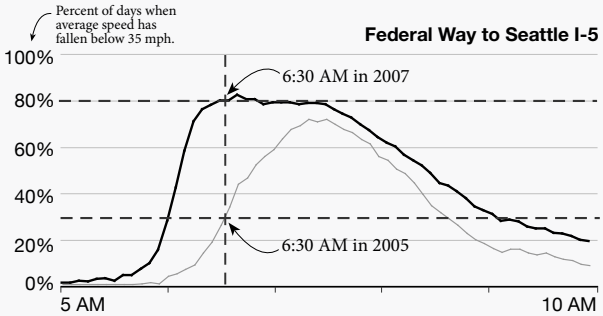
Traffic moving across the I-90 floating bridge on Lake Washington.

Stamp graphs show how the duration of peak period congestion is spreading

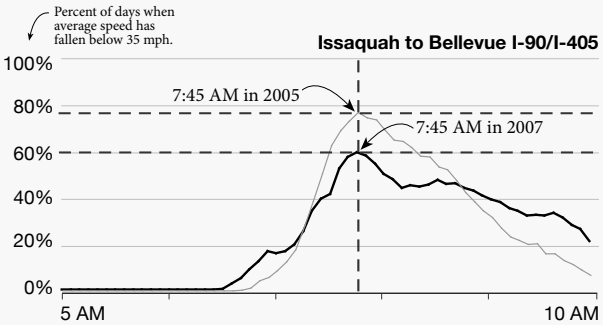
The most visual evidence of peak spreading can be seen in the stamp graphs on the following two pages. The "stamp graphs" that show severe congestion on the 38 high demand central Puget Sound commute routes. These graphs, comparing 2005 and 2007 data, show the percentage of days annually that observed speeds fell below 35 MPH on the key highway segments. For specific information on how to read stamp graphs, see the illustrations below.

How to Read a Stamp Graph: Percent of Days When Speeds Were Less Than 35 MPH

How frequently (and when) did the average trip speed drop under 35 mph? How have those conditions changed from 2005 to 2007?



At 6:30 am in 2005, you had about a 30% chance that traffic would be moving less than 35 mph. In 2007, the situation became worse (black line above the gray line); your chance that traffic would be moving slower than 35 mph was about 80% in 2007.

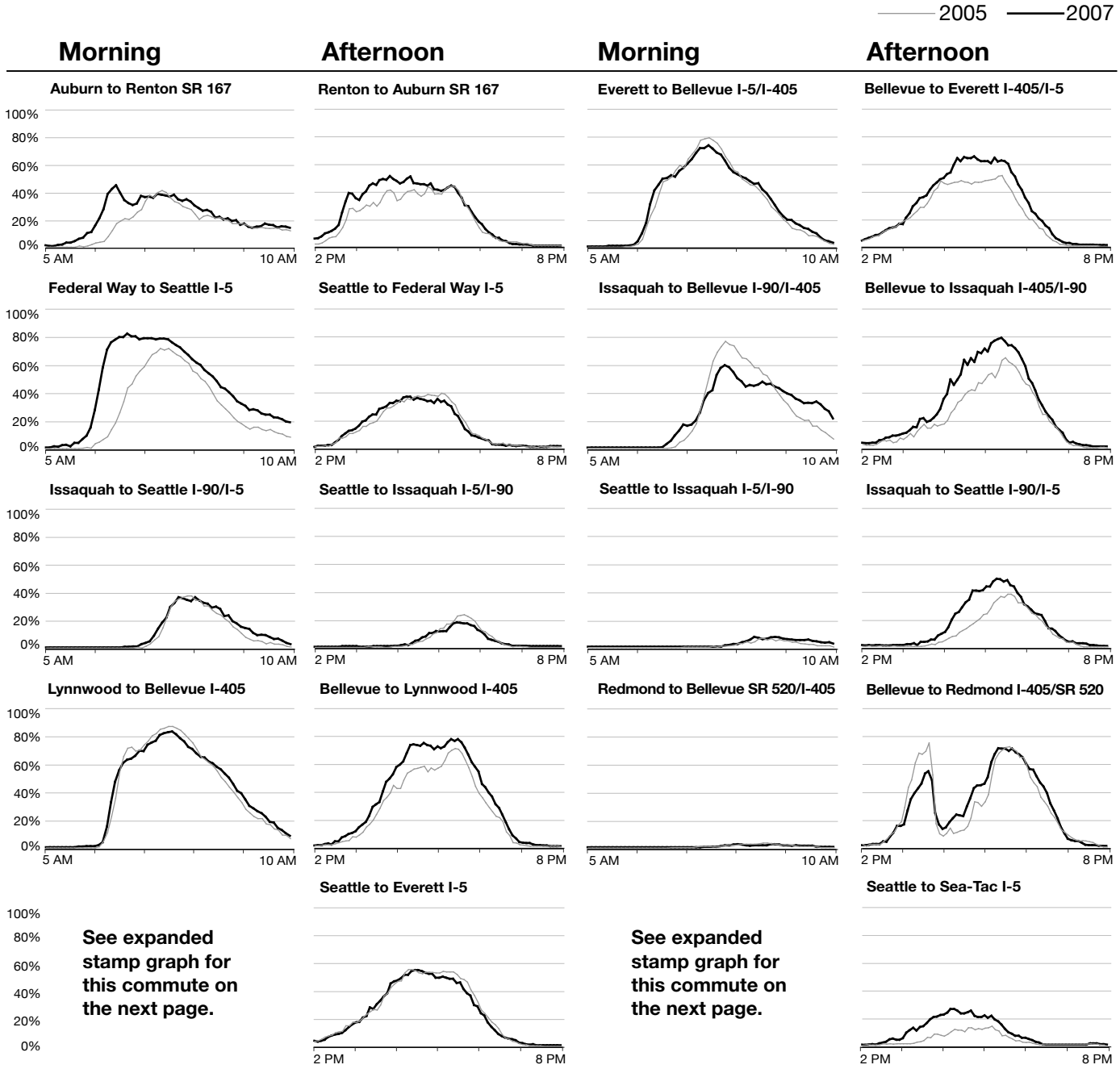


At 7:45 am in 2005, you had about a 78% chance that traffic would be moving less than 35 mph. In 2007, the situation was better (black line below the gray line); your chance that traffic would be moving slower than 35 mph was about 60%.

Travel Time Analysis of the 38 High Demand Commute Routes (continued)

Stamp Graphs: Percentage of weekdays with average speeds of 35 mph or less

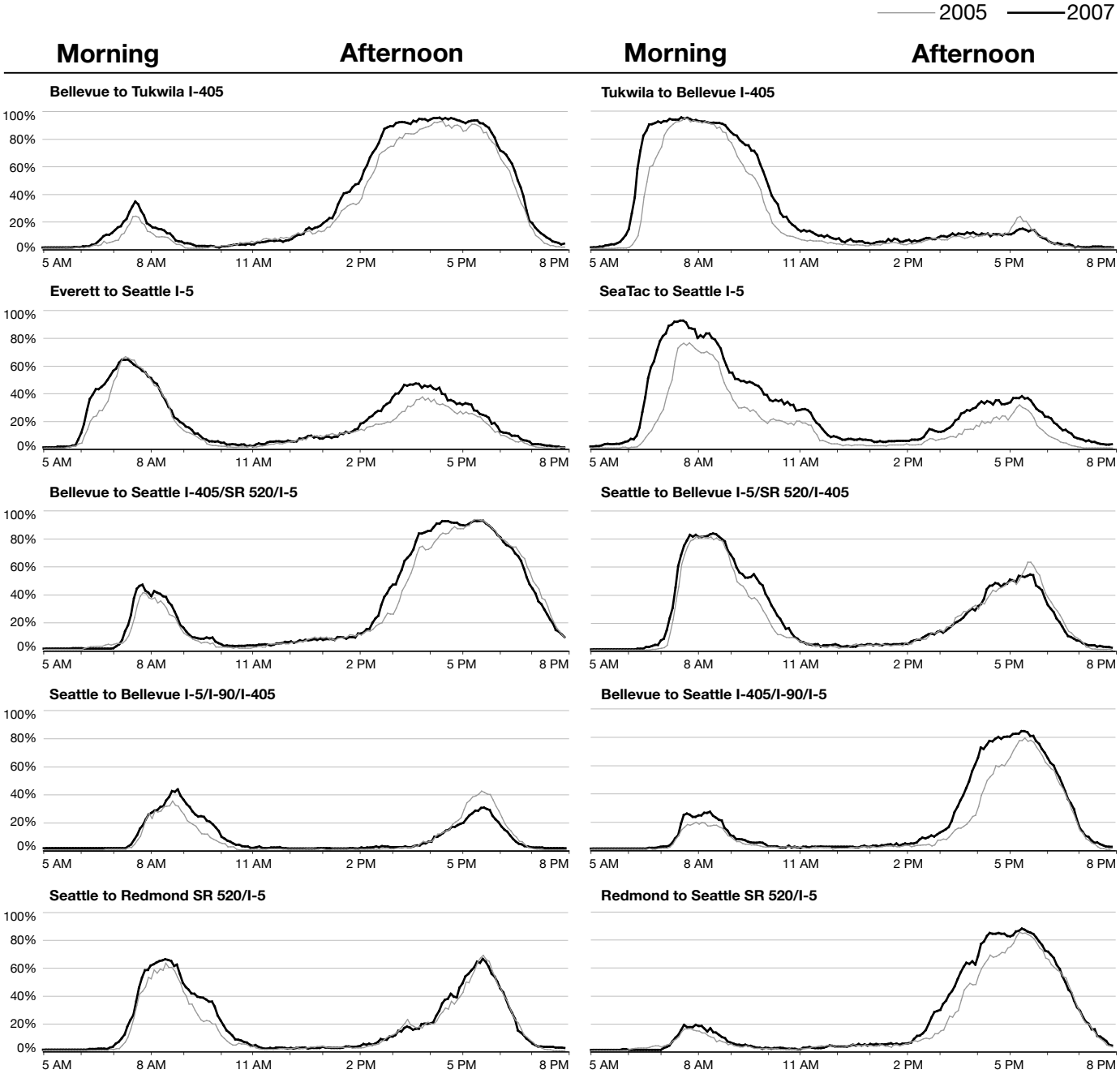
The following "stamp graphs" show how often severe congestion occurs on the 38 key central Puget Sound commute routes that are shown in the tables on pages 20 and 21. These graphs, comparing 2005 and 2007 data, show the percentage of days annually when speeds fell below 35 mph on these key commute routes. For more on how to read a stamp graph please see the illustration on page 24.



Travel Time Analysis of the 38 High Demand Commute Routes (continued)

Stamp Graphs: Percentage of weekdays with average speeds of 35 mph or less

The following expanded "stamp graphs" show how often severe congestion occurs on the 38 key central Puget Sound commute routes that are shown in the tables on pages 20 and 21. Like the graphs on the previous page, these graphs, comparing 2005 and 2007 data, show the percentage of days annually when speeds fell below 35 mph on these key commute routes. The commutes presented on this page are expanded since severe congestion on these commutes is occurring beyond the typical peak periods of 6 am to 10 am in the morning and 3 pm to 7 pm in the evening. For more on how to read a stamp graph please see the illustration on page 24.



Travel Time Analysis of the 38 High Demand Commute Routes (continued)

Below is a graphical representation of the tables from pp. 20-21, showing four of the travel times performance indicators: travel times at posted speeds, travel time at maximum throughput speeds (51 MPH), average peak travel times, and 95% reliable travel times. For each commute general purpose (GP) and HOV travel times are shown. For more information on HOV lane travel times please see pages 32-37.

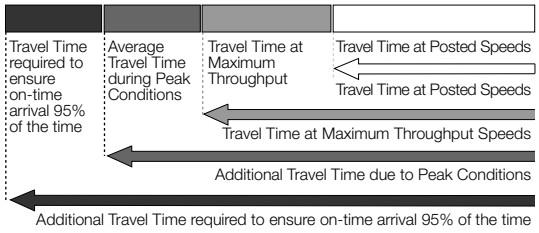
Travel times at posted speeds, maximum throughput speeds, peak travel times, and 95% reliable travel times

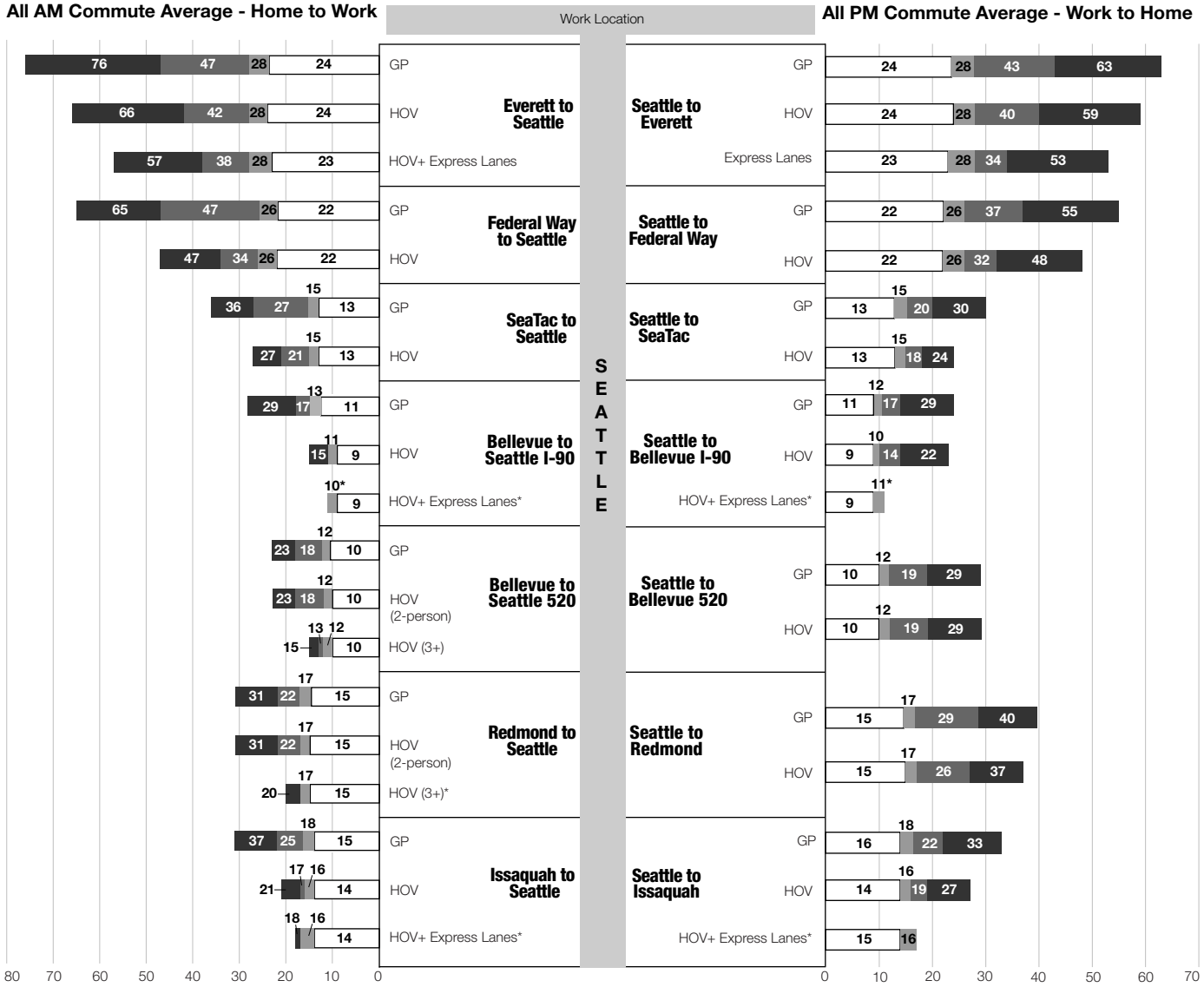
Morning and afternoon commutes by work location

Central Puget Sound area, 2007

General Purpose (GP) and High Occupancy Vehicle (HOV) Commutes; Travel time in minutes

- Travel Time at Posted Speeds with no congestion (in minutes)
- Travel Time due to Peak Condition (in minutes)
- Travel Time at Maximum Throughput Speeds 51 mph (in minutes)
- Travel Time required to ensure on-time arrival 95% of the time (in minutes)





* Note: Average Travel Times and/or 95% Reliable Travel Times were equal or faster than maximum throughput travel times on this route.

Measuring Delay and Congestion: Annual Update – 2007 Data

Travel Time Analysis of the 38 High Demand Commute Routes (continued)

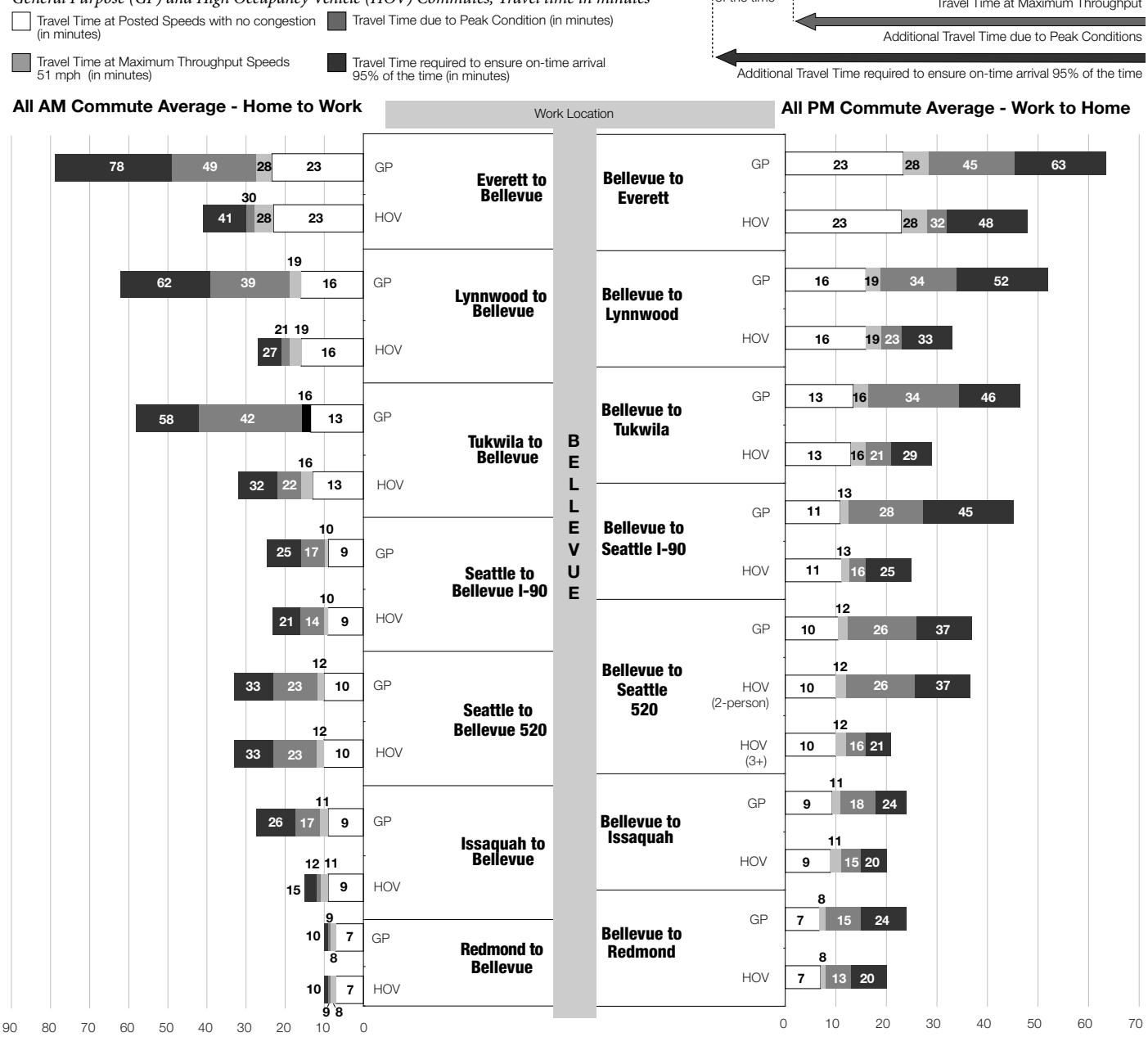
Below is a graphical representation of the tables from pp. 20-21, showing four of the travel time performance indicators: travel times at posted speeds, travel time at maximum throughput speeds (51 MPH), average peak travel times, and 95% reliable travel times. For each commute general purpose (GP) and HOV travel times are shown. For more information on HOV lane travel times please see pages 32-37.

Travel times at posted speeds, maximum throughput speeds, peak travel times, and 95% reliable travel times

Morning and afternoon commutes by work location

Central Puget Sound area, 2007

General Purpose (GP) and High Occupancy Vehicle (HOV) Commutes; Travel time in minutes



* Note: Average Travel Times and 95% Reliable Travel Times were equal or faster than maximum throughput travel times on this route.

Travel Time Analysis of the 38 High Demand Commute Routes (continued)

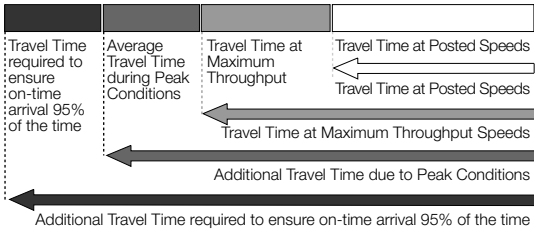
Below is a graphical representation of the tables from pp. 20-21, showing four of the travel times performance indicators: travel times at posted speeds, travel time at maximum throughput speeds (51 MPH), average peak travel times, and 95% reliable travel times. For each commute general purpose (GP) and HOV travel times are shown. For more information on HOV lane travel times please see pages 32-37.

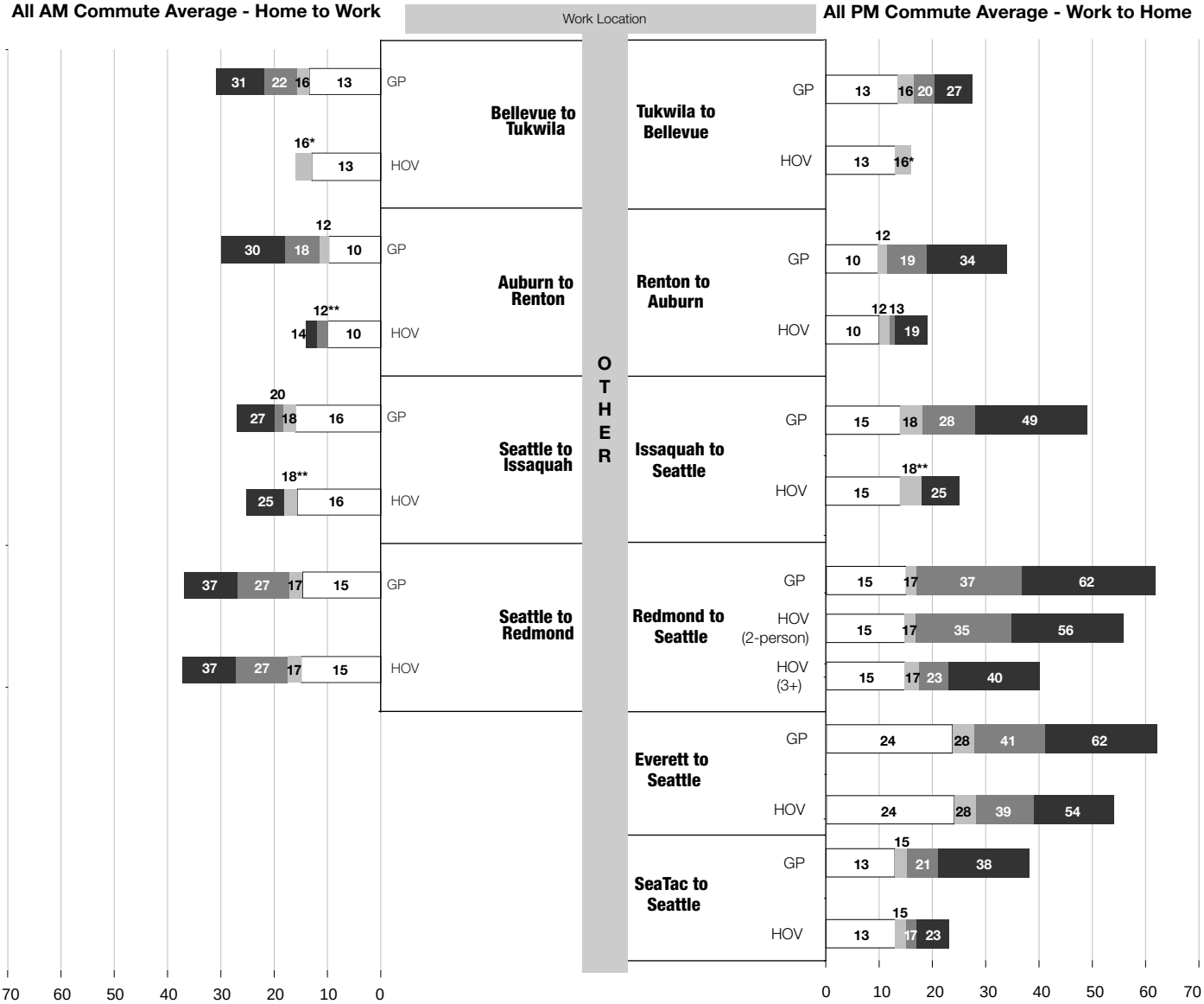
Travel times at posted speeds, maximum throughput speeds, peak travel times, and 95% reliable travel times

Morning and afternoon commutes by work location

Central Puget Sound area, 2007

General Purpose (GP) and High Occupancy Vehicle (HOV) Commutes; Travel time in minutes





Measuring Delay and Congestion: Annual Update – 2007 Data

Travel Time Analysis: 14 Additional Puget Sound Commute Routes

WSDOT tracks 14 additional routes for congestion – and finds none

WSDOT tracks a total of 52 commute routes annually representing morning and evening commutes between major population and work centers. Thirty-eight of those routes regularly experience serious congestion (pp. 25-26). The additional 14 routes, listed on this page, represent the non-congested routes for which WSDOT tracks travel time and volume data.

With one exception, these 14 routes share the following characteristics:

- The average travel times are nearly flat from 2001 to 2007;
- Peak 5-minute periods fluctuate because they are easily influenced by heavily congested days;
- At their worst average 5-minute peaks throughout the year, these route operate at the top of the maximum throughput travel time range (51 mph);
- Average speeds on these routes never fell below the bottom of the maximum throughput range (42 mph).

The 95% reliable travel time is the only measure that is showing any indications of congestion. For the seven evening routes, all of the 95% reliable travel times are trending upwards. Only two of the eight morning commutes are trending upwards – *Seattle to Everett morning commute* and *Seattle to Issaquah morning commute*. The rest are generally flat, or trending downward. Because the 95% reliable travel time is heavily influenced by a few "very bad days", it is likely that overall conditions on the routes are not changing much, as evidenced by the flat average travel times on all routes.

WSDOT routinely tracks these commutes to see if they are developing congested characteristics. Two years ago, several routes that had previously been considered "non-congested" moved to the "congested list" as housing sales boomed in the Puget Sound region. No additional routes have developed significant congestion problems in the past year, so the list of congested routes did not grow this year. WSDOT will continue to monitor these 14 routes.

Redmond to Bellevue evening commute impacted by Redmond to Seattle commute

The one exception is the *Redmond to Bellevue evening commute*, which experiences substantial travel time and reliability issues. However, most of the trouble on this route is caused by backups from the *Redmond to Seattle evening commute*. Further,

Changes in travel time performance on the "other 14" central Puget Sound commute routes

2005 peak periods versus 2007 peak periods

				Travel Time (minutes)		Average Peak Travel Time, Based on Peak Time (minutes)			95% Reliable Travel Times (minutes)			Ratio of Peak Travel Time to Maximum Through-put Travel Time MT³I		Traffic Volume Peak Period	Duration of Congestion (hours and minutes that average speed falls below 70% of posted speeds)		
Route/Commute		Peak time	Length (Miles)	At Peak Efficiency	At Posted Speed	2005	2007	% Δ	2005	2007	% Δ	2005	2007	VMT % Δ	2005	2007	change (min.)
Morning																	
I-5	Seattle to Everett	8:50 AM	23.7	28	24	26	27	+4%	31	32	+3%	0.93	0.97	-2%	*	*	N/A
I-5	Seattle to SeaTac	8:00 AM	12.9	15	13	14	14	0%	16	16	0%	0.92	0.92	-2%	*	*	N/A
I-405	Bellevue to Lynnwood	9:05 AM	16.0	19	16	17	18	+6%	18	19	+6%	0.90	0.96	-3%	*	*	N/A
SR-167	Renton to Auburn	9:45 AM	9.8	12	10	11	11	0%	13	12	-8%	0.96	0.96	-2%	*	*	N/A
I-90	Seattle to Issaquah	8:40 AM	15.7	18	16	20	20	0%	26	27	+4%	1.08	1.08	-1%	*	*	N/A
I-90	Bellevue to Issaquah	8:35 AM	9.3	11	9	11	10	-9%	15	13	-13%	1.01	0.91	-4%	*	*	N/A
I-5	Seattle to Federal Way	8:00 AM	22.1	26	22	23	23	0%	25	25	0%	0.88	0.88	-2%	*	*	N/A
I-405	Bellevue to Everett	9:25 AM	23.4	28	23	25	26	+4%	26	27	+4%	0.91	0.95	-2%	*	*	N/A
Evening																	
I-405	Lynnwood to Bellevue	5:15 PM	16.0	19	16	21	22	+5%	28	31	+11%	1.12	1.17	-3%	*	*	N/A
SR 167	Auburn to Renton	2:00/5:35 PM	9.8	12	10	12	12	0%	15	21	+40%	1.04	1.04	-5%	*	*	N/A
SR 520	Redmond to Bellevue	5:25 PM	7.1	8	7	14	16	+14%	34	35	+3%	1.67	1.91	-3%	1:40	2:50	+1:10
I-90	Issaquah to Bellevue	5:20 PM	9.5	11	10	12	12	0%	17	16	-6%	1.08	1.08	-4%	*	*	N/A
I-5	Federal Way to Seattle	5:10 PM	21.8	26	22	29	30	+3%	37	46	+24%	1.13	1.17	-3%	*	*	N/A
I-5	Everett to Bellevue	5:15 PM	23.4	28	23	30	30	0%	39	39	0%	1.09	1.09	-3%	*	*	N/A

Data Source: WSDOT Traffic Operations and the Washington State Transportation Center (TRAC) at the University of Washington.

Note: An asterisk (*) indicates that speeds did not fall below 70% of posted speed on a route; and n/a means that no information is available for a route.

2005 figures have been recalculated since their last publication in the 2005 annual congestion update, using a more refined data quality control process.

Travel Time Analysis: Spokane

there are several local roads between Redmond and Bellevue which offer non-highway alternatives to commuters so they can avoid the congestion altogether.

Spokane travel time analysis: traffic volumes increase on I-90 during the evening peak

Spokane traffic volumes continue to grow with a peak flow near Altamont Street of 114,000 vehicles per day. This is an increase of 4.6% since 2005. The effect of this growth has primarily impacted the duration of the evening peak period. Traffic volumes that were present at 3:00 pm are now being seen at 2:00 pm. This growth has resulted in moderate congestion and travel speed reductions during the afternoon commute, especially in the eastbound lanes. For the remainder of the commute, travel speed remains near what would be expected with free flow. Incidents remain the major cause of delay and congestion on the corridor as reflected in the increase in the 95% reliable travel time during the evening peak.

Intermittent back-ups of traffic moving off of I-90 have noticeably increased through several interchanges on the corridor. This appears to be the result of traffic impacts from several arterial street construction projects combined with the additional traffic on the I-90 corridor.

Changes in travel time performance on Spokane commute routes*

2005 peak periods versus 2007 peak periods

			Travel Time (minutes)		Average Peak Travel Time, Based on Peak Time (minutes : seconds)			95% Reliable Travel Times (minutes : seconds)			Traffic Volume Peak Period	Duration of Congestion (hours and minutes that average speed falls below 70% of posted speeds)		
Route/Commute	Peak time	Length (Miles)	At Peak Efficiency	At Posted Speed	2005	2007	% Δ	2005	2007	% Δ	% Δ	2005	2007	change (min.)
I-90: Argonne Rd. to Division St.	7:50 AM	7.5	8	7	7:44	8:20	+8%	8:58	10:10	+13%	+2%	-	-	N/A
I-90: Division St. to Argonne Rd.	5:20 PM	7.5	8	7	8:24	8:10	-3%	10:51	10:48	0%	0%	-	-	N/A

Source: WSDOT Eastern Region Traffic Office.

*The travel time data collection by PeMS began in December 2004. Thus, baseline travel time data will be based on the reliable data collected after March 2005 for 12-month period.

Note: For duration of congestion, speeds did not fall below 70% of posted speed on these routes.

Buses and trucks during congested conditions

Heavy trucks and buses move differently in congested traffic than passenger vehicles. Trucks and buses need to leave a longer headway (space) between themselves and vehicles in front of them for safe braking and stopping. Because these vehicles are longer, it takes cars more time to pass them, and the longer vehicles need more room to change lanes. They are also slower accelerating on hills than passenger vehicles.

While overall vehicle volumes decreased on congested central Puget Sound routes between 2005 and 2007 (pp. 25-26), truck traffic stayed steady or increased. Only one segment saw a drop in truck volumes. The largest increase in truck volumes has been on I-90 between Seattle and SR 18.

Truck traffic is somewhat constrained by the same needs that commuters face. While some trucks have the luxury of traveling outside of peak period traffic, many are on schedules for delivery during business hours and have to travel during congested periods. Existing data shows that, generally, there is less traffic on the road during the evening peak hour. WSDOT is conducting a Truck Performance Measurement Pilot Project which uses GPS tracking systems to determine the travel time, delay, and reliability for truck trips in Central Puget Sound. The final report is due in April 2010.

Bus travel generally correlates with peak period commuting, carrying thousands of commuters who would otherwise have to use passenger cars. WSDOT has attempted to mitigate the effect of buses weaving through traffic by providing Direct Access Ramps to left-hand HOV lanes. (See page 48 for more information on Direct Access Ramps).

Average annual daily truck volumes on congested highway segments in the central Puget Sound region

Route description	2005	2007	% Δ
I-5: King/Pierce Co. line to I-90	15,000	14,000	-7%
I-5: I-90 to King/Snohomish Co. line*	11,000	11,000	0%
I-90: 4th to I-5 (Seattle)	2,800	2,800	0%
I-90: I-5 (Seattle) to SR 18*	7,000	8,000	+14%
SR-167: Pierce/King Co. line to I-405	11,000	11,000	0%
I-405: I-5 (Tukwila) to SR 522	7,600	7,700	+1%
I-405: SR 522 to King/Snohomish Co. line	3,700	3,900	+5%
I-405: King/Snohomish Co. line to I-5	3,700	3,900	+5%
SR-520: I-5 (Seattle) to SR 202	2,600	2,700	+4%

Source: WSDOT Traffic Data Office and WSDOT Freight Systems Division.

* Includes Express Lanes.

HOV Lane Performance

High Occupancy Vehicle (HOV) lanes remain a vital part of the Puget Sound region's transportation system. The goal of the HOV lane network is to enhance the efficiency of the freeway network by moving more people in fewer vehicles. The HOV network is designed to provide a less-congested alternative to general purpose lanes that encourages the use of buses, carpools and vanpools, provide a more reliable travel option, and help reduce associated environmental effects. Approximately 235 miles of HOV lanes have been constructed in the central Puget Sound since 1970, of a planned 310-mile HOV network. More information about the HOV lane system can be found at http://www.wsdot.wa.gov/hov/.

WSDOT monitors two important aspects of HOV lane performance: 1) travel time and reliability benefits, and 2) number of people traveling via HOV lanes as compared to the general purpose lanes (person throughput).

Reliability: Nine HOV corridors do not meet the reliability standard in 2007

In 1996 the Washington State Transportation Commission, in consultation with WSDOT and Puget Sound region stakeholders, adopted policies that provide guidance for operation of the Freeway HOV lanes. Those policies include the following speed and reliability standard: "HOV lane vehicles should maintain or exceed an average speed of 45 mph or greater at least 90% of the time they use that lane during the peak hour."

The 2007 performance results for the Puget Sound HOV lane system indicate that significant portions of the freeway HOV lane system are experiencing increasing usage and reduced performance during the peak hours, continuing a trend seen during the past few years. Five of the seven HOV corridors in the peak direction during the evening peak hour have high enough traffic volumes that the corridors fail the HOV performance standard, and four of the seven corridors in the peak direction during the morning peak period fail the performance standard, matching the results from 2006. In addition, 6 of the 9 HOV corridors that do not meet the performance standard experienced a further decline in travel reliability in 2007 compared to 2006. The accompanying table illustrates which corridors in the peak direction of travel meet or fail the performance standard during the morning peak period and evening peak hour.

Although HOV travel time reliability is below the state performance goal on a number of Puget Sound corridors, HOV lanes continue to provide substantial travel time savings during peak periods compared to the adjacent general purpose lanes (see pp. 34-37). Also, the state HOV standard is based on peak hour performance, and does not reflect conditions at other times of the day. Outside of the peak period, all HOV corridors surpass the reliability standard.

HOV lane reliability performance on central Puget Sound corridors

2005 - 2007, based on reliability goal of the HOV lane maintaining a speed of 45 mph for 90% of the peak hour[1]

Did Not Meet the Standard[2] = **x**

Numbers represent percentage of peak hour when the 45 mph goal is met.	2005	2006	2007
Morning peak direction commutes			
I-5, SR 526 (S Everett) to NE 110th St (Seattle) SB	49% **x**	35% **x**	35% **x**
I-5, S 298th St (Federal Way) to Columbian Way (Seattle) NB	61% **x**	47% **x**	33% **x**
I-405, SR 524 (Lynnwood) to NE 4th/8th St (Bellevue CBD) SB	88%* **x**	70% **x**	76% **x**
I-405, Andover Park E (Tukwila) to NE 4th Street (Bellevue CBD) NB	70% **x**	49% **x**	31% **x**
I-90, SR 900 (Issaquah) to I-90 Reversible (Seattle) WB	100%	100%	99%
SR 520, W Lake Sammamish Pkwy NE (Redmond) to 84th Ave NE (Bellevue) WB	98%	97%	97%
SR 167, 15th St NW (Auburn) to S 34th St (Renton) NB	100%	99%	96%
Evening peak direction commutes			
I-5, Northgate Way (Seattle) to 112th St SW (S Everett) NB	73% **x**	54% **x**	51% **x**
I-5, S Spokane St (Seattle) to S 308th St (Federal Way) SB	55% **x**	46% **x**	47% **x**
I-405, NE 4th St (Bellevue CBD) to SR 524 (Lynnwood) NB	81% **x**	69% **x**	53% **x**
I-405, NE 4th/8th St (Bellevue CBD) to Andover Park E (Tukwila) SB	59% **x**	44% **x**	30% **x**
I-90, I-90 Reversible (Seattle) to193rd Pl SE (Issaquah) EB	100%	100%	100%
SR 520, W Lake Sammamish Pkwy NE (Redmond) to 84th Ave NE (Bellevue) WB	66% **x**	61% **x**	59% **x**
SR 167, S 23rd St (Renton) to 43rd St NW (Auburn) SB	98%	93%	91%

Data Source: Washington State Transportation Center (TRAC).

Data Notes: TRAC analyzes performance data for all complete segments of HOV lanes that have a loop detector. In some cases, data is not analyzed for the very beginning and ends of the lanes because there are not detectors at the very beginnings and ends of the HOV lanes.

NB = Northbound; SB = Southbound; EB = Eastbound; WB = Westbound

[1]HOV reliability performance standards are based on the peak hour. Peak hour is the one-hour period during each peak period when average travel time is slowest.

[2]Numbers represent the percentage of the peak hour when speeds are above 45 mph.

*Performance on this corridor was close to the standard; the corridor's failed performance was borderline.

HOV Lane Performance: Person Throughput

HOV lanes outperform general purpose lanes in person throughput

The WSDOT HOV lane monitoring program tracks peak period vehicle and person volumes in the HOV and general purpose lanes at 10 locations around the central Puget Sound area that are representative of freeway use on all major freeway corridors in the region. Vehicle and person volumes are measured in both directions for both HOV and general purpose lanes at each of these locations during the peak periods.

Looking at all the locations combined, total GP and HOV vehicle volumes remained steady from 2006 to 2007. The magnitude of the one-year change in vehicle volume (in the direction of peak travel, during the combined AM and PM peak periods) varied from location to location, ranging from -3% to +5% for HOV lanes, and -3% to +3% for GP lanes. It should be noted that these figures represent spot location volumes for 2006 and 2007, unlike what is reported in the travel time analysis which examines changes in VMT along commute routes between 2005 and 2007 (pp 18-31).

The percentage of vehicles in the HOV lane that did not meet the HOV occupancy requirement is relatively low compared to other locations around the country. While HOV compliance varies from location to location in the system, average observed violation rates were about 2% during both the AM and PM peak periods.

HOV lanes continue to be effective at moving more people compared to general purpose lanes

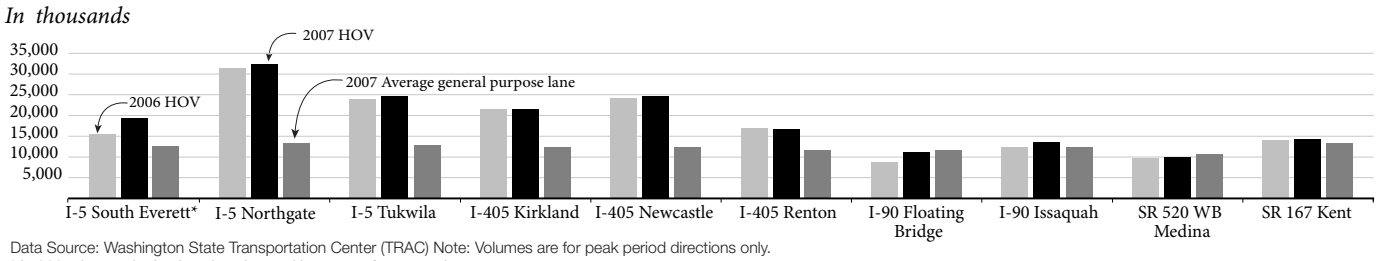
HOV lanes are designed to move more people in fewer vehicles, by providing incentives that encourage people to share rides, either in carpools and vanpools or by using transit. The HOV lane system generally succeeds in attracting large numbers of users, despite consisting of only one lane in each direction on each freeway route. At the monitoring locations, the average HOV lane carries about 35% of the people on the freeway in the morning and evening peak periods.

HOV lanes are not equally used throughout the region. The highest HOV lane use occurs where HOV lanes have a time advantage over general purpose lanes or where excellent transit service is provided. I-5 near Northgate is an example of the person moving capability of comprehensive transit service. In the morning peak period the southbound HOV lanes move about 14,400 people, or 44% of the people on that section of I-5, in only 21% of the vehicles. The HOV lane carries an average of 3.5 people in each vehicle, making it nearly three times as effective at moving people as the average general purpose lane next to it. Not all HOV lanes in the region carry such high percentages of freeway travelers. However, nearly every monitoring location has experienced increasing person volumes in the HOV lane from 2006 to 2007; this continues a trend seen from 2004 to 2006. The graph below compares person throughput for HOV lanes to general purpose lanes on the major corridors during the peak periods.

Previous *Gray Notebook* reports on HOV lanes (2005 and 2006) noted that HOV lane person throughput was not exceeding general purpose lane throughput at four monitoring locations: the I-90 Floating Bridge, I-90 in Issaquah, SR 520 Westbound at Medina, and SR 167 in Kent. From 2004 to 2006, those locations all experienced increased HOV use, and this trend continued in 2007. On I-90, the number of persons using the I-90 HOV lane near Issaquah in the peak direction during peak periods has grown by 9% from 2006 to 2007. At the Issaquah I-90 location and at SR 167 near Kent, HOV person volumes now exceed the person throughput of the average adjacent general purpose lane.

The two remaining locations that have not met the person throughput goal are I-90's Floating Bridge, a two-lane HOV/express facility that has a limited number of access points and allows single-occupant vehicles to travel between Mercer Island and Seattle; and SR 520 Westbound at Medina, where the 3+ occupancy restriction reduces the number of vehicles eligible to use that HOV lane. Both locations saw an increase in person volume from 2006 to 2007.

2007 HOV lane and general purpose lane person throughput comparison
Total of AM and PM peak period volumes



Data Source: Washington State Transportation Center (TRAC) Note: Volumes are for peak period directions only.
* In 2007 the monitoring location changed because of construction.

HOV Lane Performance: HOV Lane Travel Times for Morning Commutes

The new HOV lane performance section looks at average and 95% reliable travel times for HOV commute routes in comparison to adjacent general purpose lane commute travel times. The tables on this page and the next show travel times for HOV lanes along the 38 key Puget Sound commutes. In some cases, additional travel times are provided to reflect the use of the reversible Express Lanes. On four westbound routes across SR 520, travel times are provided for both 2-person and 3+ HOVs, since part of the HOV system on that highway is open only to 3+ person HOVs.

2007 average travel times in HOV lanes are better than GP lanes for 39 out of 48 HOV commutes

Average Travel Times and 95% Reliable Travel times are almost always faster in HOV lanes than in general purpose (GP) lanes. Of the 48 2-person HOV lanes, 3+ HOV lanes, and Express lanes that run alongside the 38 key commute routes, 39 provide between one minute and 20 minutes of savings in average travel time. Forty provide better reliability (95% reliable travel time) than their general-purpose counterparts.

HOV lane travel time performance compared to general purpose lanes

A.M. peak

		Average Travel Times (minutes)					95% Reliable Travel Times (minutes)				
		HOV Lanes		Change 2005 HOV vs. 2007 HOV	GP Lanes	Difference 2007 HOV vs. 2007 GP	HOV Lanes		Change 2005 HOV vs. 2007 HOV	GP Lanes	Difference 2007 HOV vs. 2007 GP
Commute Route	Peak time	2005	2007		2007		2005	2007		2007	
To Seattle											
I-5–Everett to Seattle - Regular HOV lane[2]	7:25 AM	40	42	+2	47	-5	60	66	+6	76	-10
Reversible lanes[2]	7:25 AM	35	38	+3	47	-9	51	57	+6	76	-19
I-5–Federal Way to Seattle	7:00 AM	31	34	+3	47	-13	40	47	+7	65	-18
I-90–Issaquah to Seattle - HOV & GP lanes[1]	7:45 AM	17	17	0	22	-5	22	21	-1	31	-10
HOV & reversible lanes[1]	7:45 AM	16	16	0	22	-6	19	18	-1	31	-13
SR-520–Redmond to Seattle-2-person[3 (a,b)]	7:40 AM	22	22	0	22	0	30	31	+1	31	0
3+	7:40 AM	17	17	0	22	-5	20	20	0	31	-11
I-5–SeaTac to Seattle	7:35 AM	17	21	+4	27	-6	25	27	+2	36	-9
I-90–Bellevue to Seattle - HOV & GP lanes[1]	7:50 AM	11	11	0	13	-2	15	15	0	19	-4
HOV & reversible lanes[1]	7:50 AM	9	9	0	13	-4	11	10	-1	19	-9
SR-520–Bellevue to Seattle - 2-person[3 (a,c)]	7:50 AM	18	18	0	18	0	25	23	-2	23	0
3+	7:50 AM	13	13	0	18	-5	16	15	-1	23	-8
To Bellevue											
I-405–Everett to Bellevue	7:25 AM	27	30	+3	49	-19	36	41	+5	81	-40
I-405–Lynnwood to Bellevue	7:35 AM	19	21	+2	39	-18	24	27	+3	62	-35
I-405–Tukwila to Bellevue	7:45 AM	18	22	+4	42	-20	28	32	+4	58	-26
I-90–Seattle to Bellevue - HOV & GP lanes[1]	8:45 AM	14	14	0	15	-1	20	21	+1	22	-1
SR-520–Seattle to Bellevue[3 (a,c)]	8:35 AM	20	23	+3	23	0	30	33	+3	33	0
I-90–Issaquah to Bellevue	7:45 AM	14	12	-2	17	-5	17	15	-2	26	-11
SR 520–Redmond to Bellevue[3 (b,c)]	7:50 AM	9	9	0	9	0	10	10	0	10	0
To other locations											
I-405–Bellevue to Tukwila	7:40 AM	14	14	0	22	-8	14	15	+1	31	-16
SR 167–Auburn to Renton	6:25 AM	10	11	+1	18	-7	12	14	+2	30	-16
SR 520–Seattle to Redmond[3 (a,b)]	8:25 AM	25	27	+2	27	0	33	37	+4	37	0
I-90–Seattle to Issaquah - HOV & GP lanes[1, 3 (a,b)]	8:40 AM	18	18	0	18	0	23	25	+2	25	0

Source: WSDOT Traffic Operations and the Washington State Transportation Center (TRAC) at the University of Washington.

[1] Trips that are to/from Seattle on I-90 in the general purpose lanes are slightly shorter than those used for the traditional routes. This allows for an apples-to-apples comparison of the GP and HOV lanes on I-90. However, travel times for trips in the GP lanes will not match travel times in the tables on pages 18-31.

[2] The I-5 trips between Everett and Seattle using the reversible lanes are shorter by 0.3 miles than their GP counterparts. No adjustment was made to the travel time calculations.

[3] This HOV lane does not provide travel time benefits over GP lanes because: a) The HOV lane does not run along the entire route; b) There is no congestion in the general purpose lanes on some segments of this route; and/or c) The HOV lane is inconveniently located for use on this commute route.

Note: HOV Trips with the same endpoints as GP lane trips, but differing lengths, do not require any adjustment, since the difference in lengths is the result of HOVs using different roadways than GPs (e.g., an HOV-only interchange ramp).

HOV Lane Performance: HOV Lane Travel Times for Evening Commutes

Nine trips offer no HOV travel time benefit for either the average and/or 95th percent travel times. For these trips, it is not necessarily an overloaded HOV lane that is causing the lack of benefit:

- On nearly every one of the nine trips, there is no HOV lane along some or the entire trip route; therefore high-occupancy vehicles would be traveling in the general purpose lanes. For those segments, there would be no HOV time savings vs. GP travel times.
- On some trips, some segments of the HOV lane are parallel to GP lanes that have no congestion for that time of day, and therefore there is no HOV time savings.
- On some trips, an HOV user would not use the HOV lane even when it is available on that trip, because it would not be a logical choice. For example, on the Seattle to Bellevue

HOV lane travel time performance compared to general purpose lanes

P.M. peak

		Average travel times (minutes)					95% Reliable travel times (minutes)				
		HOV Lanes		Change 2005 HOV vs.	GP Lanes	Difference 2007 HOV vs.	HOV Lanes		Change 2005 HOV vs.	GP Lanes	Difference 2007 HOV vs.
Commute Route	Peak time	2005	2007	2007 HOV	2007	2007 GP	2005	2007	2007 HOV	2007	2007 GP
From Seattle											
I-5–Seattle to Everett - Regular HOV lanes [2]	4:20 PM	41	40	-1	43	-3	62	59	-3	63	-4
Reversible lanes [2]	4:20 PM	34	34	0	43	-9	55	53	-2	63	-10
I-5–Seattle to Federal Way	4:10 PM	32	32	0	37	-5	48	48	0	55	-7
I-5–Seattle to SeaTac	4:10 PM	18	18	0	20	-2	25	24	-1	30	-6
I-90–Seattle to Bellevue - HOV & GP lanes[1, 3(a)]	5:30 PM	15	14	-1	14	0	23	22	-1	24	-2
HOV & reversible lanes[1]	5:30 PM	10	10	0	14	-4	11	10	-1	24	-14
SR-520–Seattle to Bellevue[3 (a,c)]	5:30 PM	20	19	-1	19	0	32	29	-3	29	0
SR 520–Seattle to Redmond	5:35 PM	26	26	0	29	-3	38	37	-1	40	-3
I-90–Seattle to Issaquah - HOV & GP lanes[1]	5:30 PM	20	19	-1	20	-1	27	27	0	29	-2
HOV & reversible lanes[1]	5:30 PM	14	15	+1	20	-5	15	16	+1	29	-13
From Bellevue											
I-405–Bellevue to Everett	4:30 PM	31	32	+1	45	-13	46	48	+2	63	-15
I-405–Bellevue to Lynnwood	4:20 PM	20	23	+3	34	-11	27	33	+6	52	-19
I-405–Bellevue to Tukwila	4:20 PM	19	21	+2	34	-13	26	29	+3	46	-17
I-90–Bellevue to Seattle - HOV & GP lanes[1]	5:15 PM	15	16	+1	23	-7	23	25	+2	36	-11
SR-520–Bellevue to Seattle - 2 person[3(a,c)]	5:30 PM	26	26	0	26	0	34	37	+3	37	0
3+	5:30 PM	16	16	0	26	-10	20	21	+1	37	-16
I-90–Bellevue to Issaquah	5:30 PM	13	15	+2	18	-3	16	20	+4	24	-4
SR 520–Bellevue to Redmond	5:35 PM	11	13	+2	15	-2	15	20	+5	24	-4
To Other Locations											
I-5–SeaTac to Seattle	5:20 PM	16	17	+1	21	-4	20	23	+3	38	-15
I-5–Everett to Seattle - Regular HOV lane [2]	3:35 PM	36	39	+3	41	-2	49	54	+5	62	-8
I-405–Tukwila to Bellevue	5:20 PM	14	15	+1	20	-5	15	15	0	27	-12
SR 167–Renton to Auburn	4:20 PM	11	13	+2	19	-6	15	19	+4	34	-15
SR-520–Redmond to Seattle - 2 person	5:25 PM	34	35	+1	37	-2	55	56	+1	62	-6
3+	5:25 PM	22	23	+1	37	-14	39	40	+1	62	-22
I-90–Issaquah to Seattle - HOV & GP lanes[1]	5:20 PM	18	18	0	23	-5	23	25	+2	40	-15

Source: WSDOT Traffic Operations and the Washington State Transportation Center (TRAC) at the University of Washington.

[1] Trips that are to/from Seattle on I-90 in the general purpose lanes are slightly shorter than those used for the traditional routes. This allows for an apples-to-apples comparison of the GP and HOV lanes on I-90. However, travel times for trips in the GP lanes will not match travel times in the tables on pages 18-31.

[2] The I-5 trips between Everett and Seattle using the reversible lanes are shorter by 0.3 miles than their GP counterparts. No adjustment was made to the travel time calculations.

[3] This HOV lane does not provide travel time benefits over GP lanes because: a) The HOV lane does not run along the entire route; b) There is no congestion in the general purpose lanes on some segments of this route; and/or c) The HOV lane is inconveniently located for use on this commute route.

Note: HOV Trips with the same endpoints as GP lane trips, but differing lengths, do not require any adjustment, since the difference in lengths is the result of HOVs using different roadways than GPs (e.g., an HOV-only interchange ramp).

HOV Lane Performance: HOV Lane vs. GP Lane Travel Times

via SR 520 route, there is an HOV lane on southbound 405 in Bellevue. But an HOV user would not weave to the inside to use that HOV lane, because the Bellevue exit is coming up shortly. So HOV drivers would stay in the GP lanes on I-405, and therefore there is no HOV travel time benefit vs. GP travelers there.

Changes in average HOV travel times from 2005 to 2007 consistent with changes for GP lanes

Decreases or increases in average travel times for HOV lane and Express lanes are consistent with their general purpose counterpart trips, within one to two minutes. This implies that the same changes in congestion pressures that are faced by the GP lanes are also experienced by the HOV lanes.

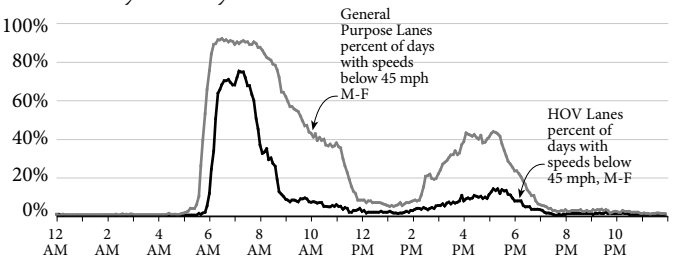
How do HOV lane travel time data compare with the HOV lane reliability performance goal?

The table on page 34 presents performance data showing whether or not HOV lanes meet the standard of achieving 45 mph speed at least 90% of the time. Typically, when travel times in HOV lanes are even with the travel times in congested GP lanes during peak periods, the HOV lane fails the reliability standard. The comparison of travel times to performance data is not perfect, because the travel time data on this page is for full routes, which might include more than one highway and the transitions between them, while the reliability data on page 36 are based on the performance of an HOV lane on a single highway segment.

The graphs below show the existing HOV lane system's performance versus the performance of the general purpose (GP) lanes for selected Puget Sound commutes. The line graphs represent the percent of days when average vehicle speeds fell below 45 mph (the HOV lane reliability performance standard), throughout the course of the day. The dark line represents the HOV lanes, while the gray line represents the general purpose lanes.

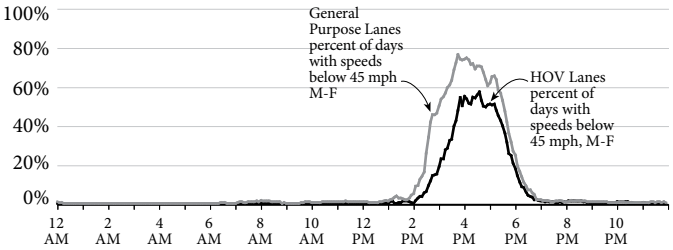
I-5 Federal Way to Seattle

2007 Weekday data only



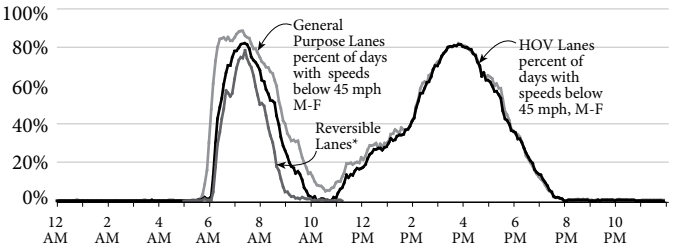
I-5 Seattle to Federal Way

2007 Weekday data only



I-5 Everett to Seattle

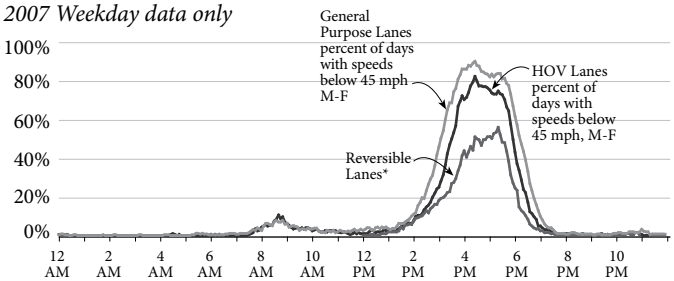
2007 Weekday data only



* Monday-Friday Hours of Operation: Southbound - 5 am to 11:15 am; Northbound - Noon to 11 pm; Closed - 11 pm to 5 am.

I-5 Seattle to Everett

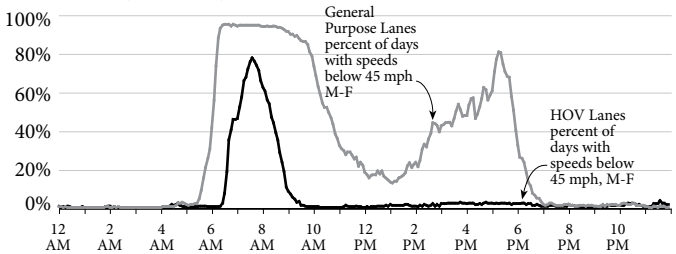
2007 Weekday data only



* Monday-Friday Hours of Operation: Southbound - 5 am to 11:15 am; Northbound - Noon to 11 pm; Closed - 11 pm to 5 am.

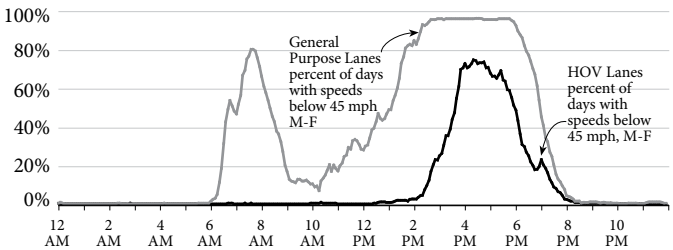
I-405 Tukwila to Bellevue

2007 Weekday data only



I-405 Bellevue to Tukwila

2007 Weekday data only

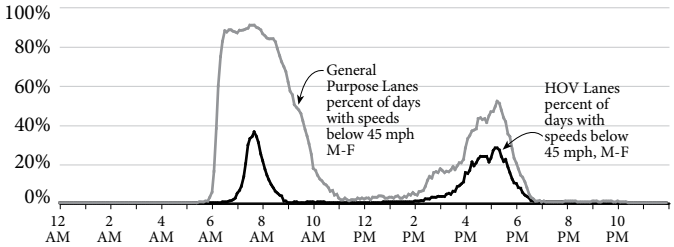


HOV Lane Performance: HOV Lane vs. GP Lane Travel Times

The graphs below show the existing HOV lane system's performance versus the performance of the general purpose (GP) lanes for selected Puget Sound commutes. The line graphs represent the percent of days when average vehicle speeds fell below 45 mph (the HOV lane reliability performance standard), throughout the course of the day. The dark line represents the HOV lanes, while the gray line represents the general purpose lanes.

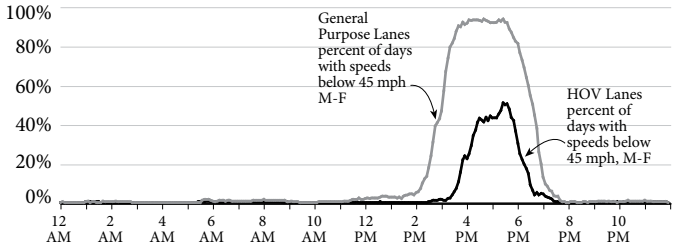
I-405 Lynnwood to Bellevue

2007 Weekday data only



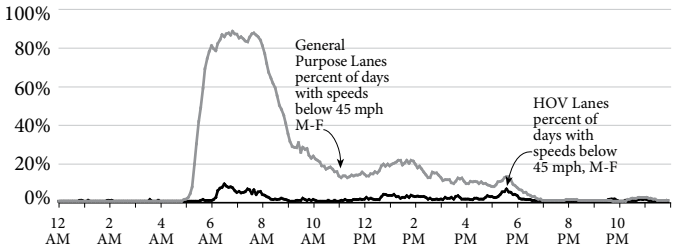
I-405 Bellevue to Lynnwood

2007 Weekday data only



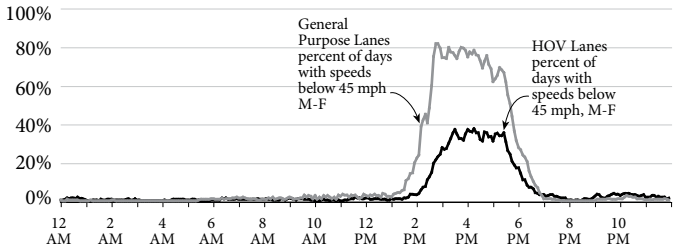
SR 167 Auburn to Renton

2007 Weekday data only



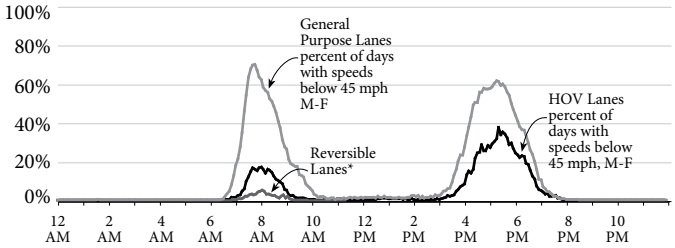
SR 167 Renton to Auburn

2007 Weekday data only



I-90/I-5 Issaquah to Seattle

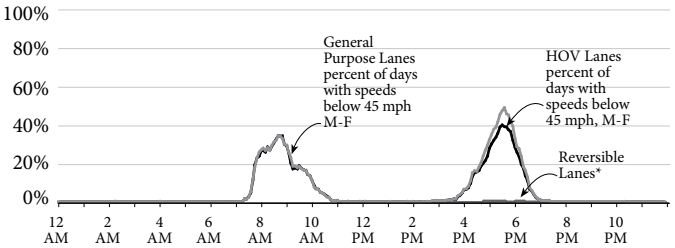
2007 Weekday data only



* Monday-Friday Hours of Operation: Westbound - 1am to 12:30 pm; Eastbound - 2 pm to Midnight.

I-5/I-90 Seattle to Issaquah

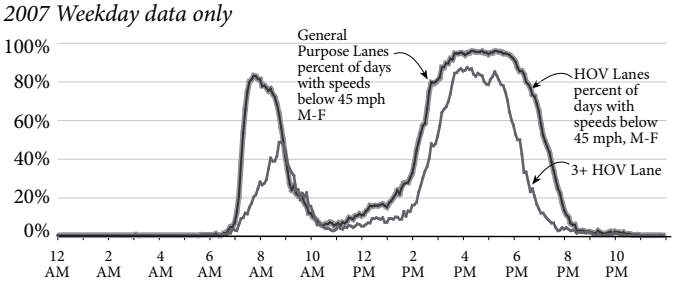
2007 Weekday data only



* Monday-Friday Hours of Operation: Westbound - 1am to 12:30 pm; Eastbound - 2 pm to Midnight.

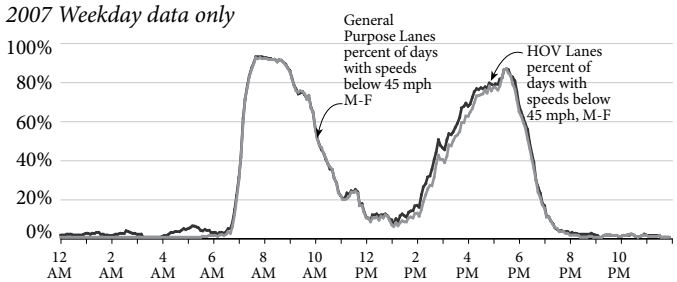
I-405/SR 520/I-5 Bellevue to Seattle

2007 Weekday data only



I-5/SR 520/I-405 Seattle to Bellevue

2007 Weekday data only



Measuring Delay and Congestion Annual Update – 2007 Data

Throughput Productivity

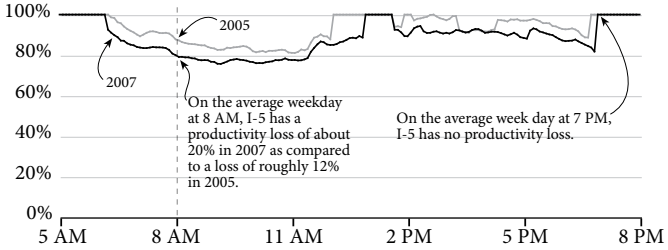
When a highway is congested it is serving fewer vehicles than it is designed to carry. Lost throughput productivity measures the percentage of a highway's vehicle throughput capacity that is lost due to congestion. This is calculated as the difference between the optimal capacity of the roadway observed at maximum throughput speeds as compared to the number of vehicles that the road is actually serving at a particular time of day. Under ideal conditions, the maximum throughput of vehicles moving through a freeway segment can be as high as 2,000 vehicles per lane per hour (vplph). This is observed when traveling at speeds in the range of 70%-85% of the posted speed (42-51 mph). Under congested conditions (41 mph and below), however, the volume of traffic moving through a given freeway segment can be as low as 700 vehicles per lane per hour. For more information on the concept of maximum throughput and why WSDOT uses it as a basis for measuring congestion please see the gray box to the right.

WSDOT uses highest observed optimal flow rate used to determine lost throughput productivity

In past editions of the *Gray Notebook* lost throughput productivity was determined based on the ideal maximum throughput capacity of 2000 vplph. However, not all lanes can achieve a maximum throughput of 2,000 vplph because highway capacity varies depending on prevailing roadway design and traffic conditions. For this reason, the congestion annual update uses the highest average five minute flow rate recorded for 2005 and 2007 as the basis for measuring lost throughput productivity. By using the highest observed optimal flow rate as the maximum throughput standard for each monitoring location, the lost throughput analysis can more accurately determine the loss in throughput productivity owed to increases in congestion between 2005 and 2007.

Lost vehicle throughput productivity: example

Based on the highest average five minute flow rates observed on I-5 at I-90, MP 164, for both directions of traffic in 2005 and 2007



Major Puget Sound freeways continue to see decreased throughput productivity during peak periods

The graphs on the following page compare observed average flow rates to the observed highest average five minute flow rate to show the loss in vehicle throughput productivity for each monitoring location. All evaluated locations show marginal decreases in vehicle throughput from 2005 to 2007.

I-405 at SR 169 in Renton continues to experience the greatest loss in throughput productivity, whereby congested conditions result in an approximate 50% reduction in vehicle throughput during the morning peak period. On I-405 in Kirkland increases in lost throughput productivity seen in 2007, particularly during the evening peak period, is likely due to construction activity in the area.

Maximum throughput as a basis for congestion measurement

From the perspective of operating the highway system as efficiently as possible, speeds at which the most vehicles can move through a highway segment (maximum throughput) is the most meaningful basis of measurement for WSDOT's management needs. It is logical for WSDOT to aim towards providing and maintaining a system that yields the most productivity (or efficiency) versus providing a free flowing system where not as many vehicles are passing through a segment during peak travel periods.

Maximum throughput is achieved when vehicles travel at speeds between 42-51 mph (roughly 70% and 85% of posted speeds). At maximum throughput speeds, highways are operating at peak efficiency because more vehicles are passing through the segment than there would be at posted speeds. This happens because drivers at maximum throughput speeds can safely travel with a shorter following distance between vehicles than they can at posted speeds.

Maximum throughput speeds vary from one highway segment to the next depending on prevailing roadway design and traffic conditions, such as lane width, slope, shoulder width, pavement conditions, traffic compositions, conflicting traffic movements, heavy truck traffic, presence or lack of median barriers, etc. It should also be noted that maximum throughput speed is not static and can change over time as conditions change. Ideally, maximum throughput speeds for each highway segment should be determined through comprehensive traffic studies and validated based on field surveys. For surface arterials, maximum throughput speeds are difficult to predict due to the fact that they are heavily influenced by conflicting traffic movements at intersections.

WSDOT uses the maximum throughput standard as a basis for measurement to assess travel delay relative to a highway's most efficient condition at optimal flow speeds (approximately 51 mph). For more information on changes in travel delay performance please see pp. 40-41.

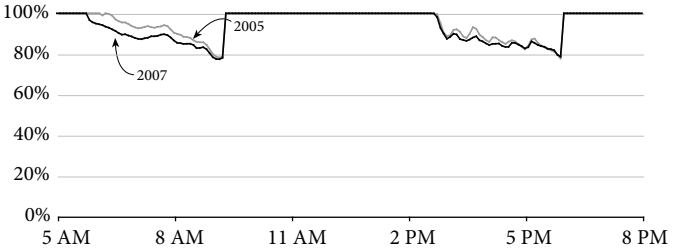
Throughput Productivity

Lost throughput productivity at selected central Puget Sound freeway locations

Based on highest observed five minute flow rates, 2005 vs. 2007

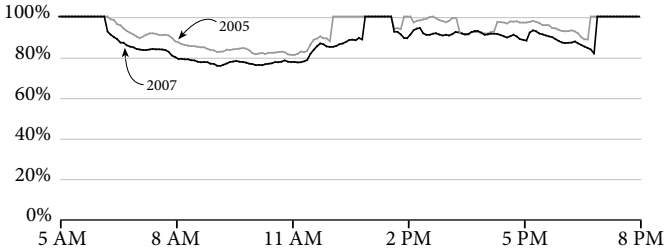
I-5 at S 188th Street, near Sea-Tac (MP 153.0)

Based on A.M. northbound 1,950 vplph and P.M. southbound 1,650 vplph



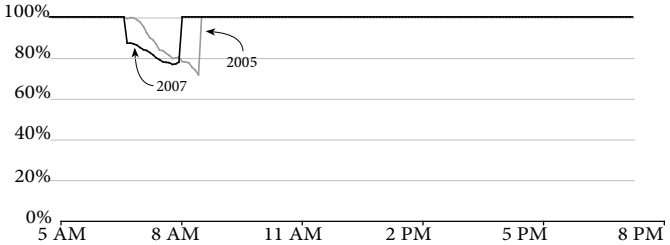
I-5 at I-90 (MP 164.0)

Based on A.M. northbound 1,730 vplph and P.M. southbound 1,500 vplph



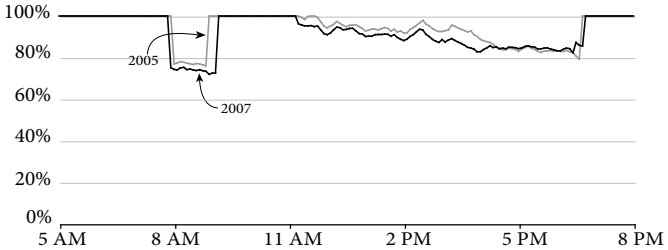
I-90 at SR 900, in Issaquah (MP 16.5)

Based on A.M. westbound 1,600 vplph and P.M. eastbound 1,660 vplph



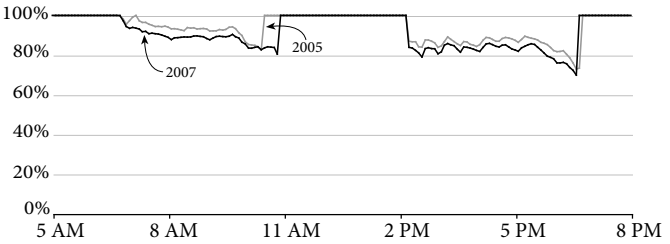
I-5 at NE 103rd Street, near Northgate (MP 172.0)

Based on A.M. southbound 1,560 vplph and P.M. northbound 1,620 vplph



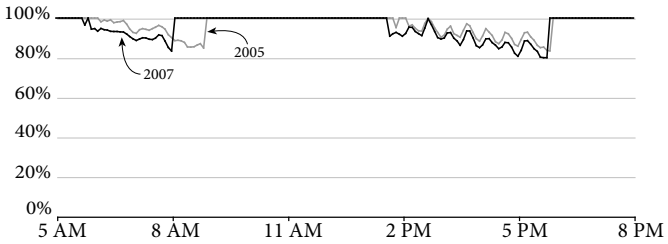
SR 520 at Evergreen Point Floating Bridge (MP 1.5)

Based on A.M. westbound 1,800 vplph and P.M. eastbound 1,800 vplph



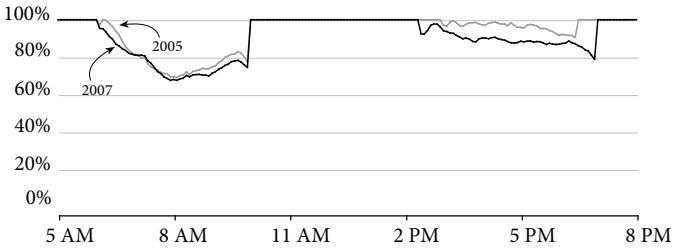
SR 167 at 84th Avenue SE (MP 21.5)

Based on A.M. northbound 1,600 vplph and P.M. southbound 1,600 vplph



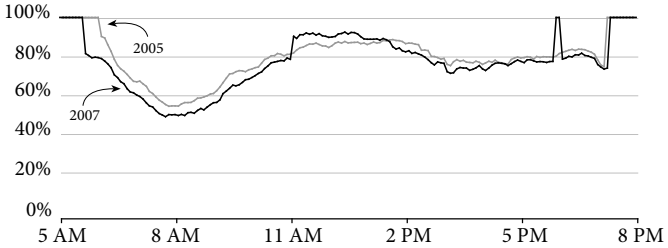
I-405 at NE 160th Street, in Kirkland (MP 22.5)

Based on A.M. southbound 1,780 vplph and P.M. northbound 1,700 vplph



I-405 at SR 169, in Renton (MP 4.0)

Based on A.M. northbound 1,970 vplph and P.M. southbound 1,480 vplph



Measuring Delay and Congestion Annual Update – 2007 Data

Measuring Travel Delay: Statewide

Drivers experience delay when congestion occurs. Simply put, delay is the extra period of time it takes a driver to get to her or his destination of choice. Delay is typically calculated as the difference between actual travel times and posted speed travel times. WSDOT uses the maximum throughput standard as a basis for measurement to assess delay relative to a highway's most efficient condition at optimal flow speeds. For the purpose of this analysis, delay is estimated based on both standards: relative to the posted speed limit and relative to maximum throughput speed. For both standards, WSDOT measures the sum of vehicle delay (in hours) across an average twenty-four hour day as one of the most basic measures for assessing congestion. The measure is used to demonstrate the extent, severity, and duration of congestion.

Statewide delay increases marginally between 2005-2007

Overall, there has been a slight increase in the amount of delay on state highways between 2005 and 2007. Statewide delay, relative to maximum throughput speeds and posted speeds, increased by 3% and 4% respectively. The increase relative to maximum throughput speeds indicate that many congested highways across the state became slightly more congested between 2005 to 2007.

Relative to optimal flow speeds, statewide delay cost drivers and businesses $617 million in 2007

In 2007, delay, relative to maximum throughput speeds, cost Washington businesses and drivers roughly $617 million—$13 million more than in 2005 ($604 million).

Relative to posted speeds, delay cost drivers and businesses $1,096 million in 2007, an increase of $42 million compared to 2005 ($1,054 million).

The cost of delay is calculated by applying monetary values to the estimated hours of delay incurred in passenger and truck travel plus additional vehicle operating costs. The value of time for passenger

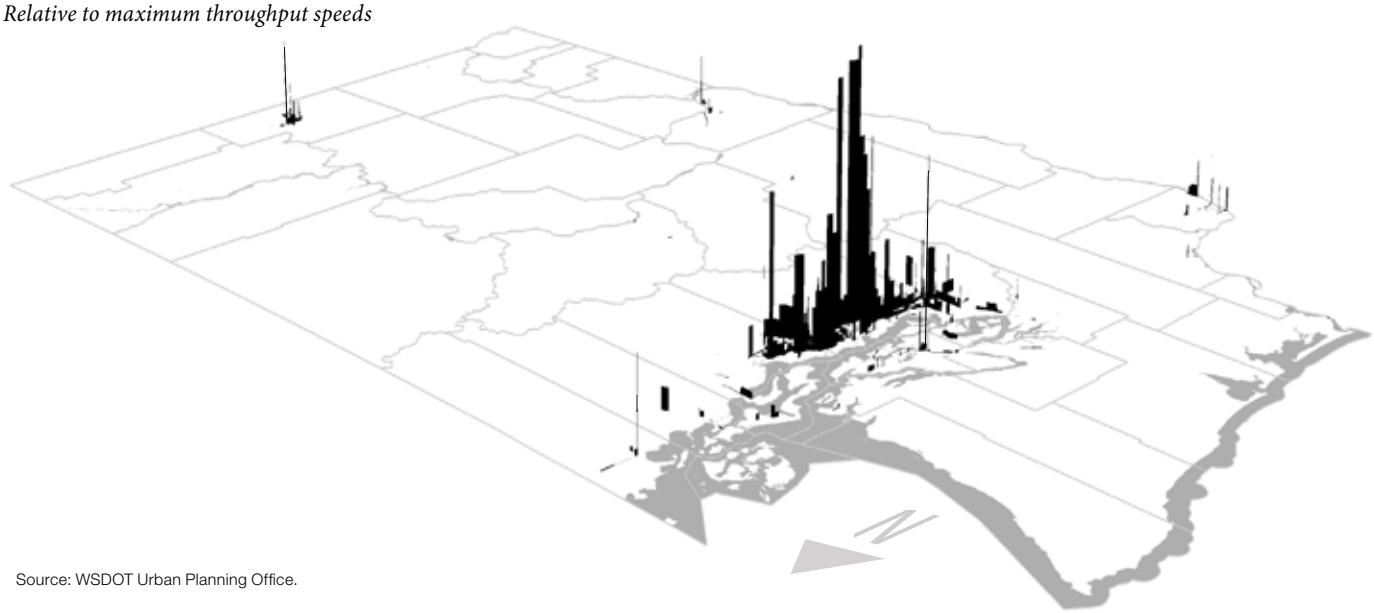
All state highways: average weekday delay comparison (daily and annual) and estimated cost of delay on state highways (annual), 2005 and 2007

	Daily average vehicle hours of delay (weekdays)			**Total annual weekday vehicle hours of delay** (in thousands)			**Annual cost of delay on state highways** (in millions of 2007 dollars)		
Actual travel compared to	**2005**	**2007**	**%Δ**	**2005**	**2007**	**%Δ**	**2005**	**2007**	**%Δ**
Maximum throughput speeds (Approx. 51 mph)	99,400	101,960	+2.6%	24,847	25,490	+2.6%	$604	$617	+2.2%
Posted Speeds (60 mph)	173,800	181,020	+4.2%	43,450	45,255	+4.2%	$1,054	$1,096	+4.0%

Data Source: WSDOT Urban Planning Office.

Daily vehicle hours of delay per mile in Washington State

Relative to maximum throughput speeds



Source: WSDOT Urban Planning Office.

Measuring Travel Delay: Puget Sound

trips was assumed to be half of the average wage rate. Prior to the September 30, 2007 *Gray Notebook*, cost of delay was calculated by applying values to the estimated hours of delay incurred in passenger and truck travel plus additional vehicle operating costs; and the value of time for passenger trips was assumed to be half of the average wage rate.

Congestion, or delay, imposes costs for the lost time of travelers, higher vehicle operating costs from such things as wasted fuel, and other effects of stop and go driving. Truckers and shippers and their customers also bear large costs from traffic delay. It is generally recognized that delay has a variety of direct and indirect impacts, including:

- Increased travel time for personal travel.
- Increased travel time for business travel.
- Increased vehicle operating expense.
- Direct shipper/recipient productivity lost.
- Indirect (downstream) productivity lost.
- Local income/economy suffered from lost opportunities to attract new businesses.
- Increased vehicle emissions due to stop and go conditions.

Only the first three items were included in this year's delay estimates.

Increases in delay on major central Puget Sound corridors begin levelling off

There was a slight increase in the overall daily vehicle hours of delay on the major freeway corridors in the central Puget Sound region between 2005 and 2007. During this time period, vehicle hours of delay relative to the posted speeds (60 mph) and maximum throughput speeds increased by approximately 8% and 12% respectively. The increase in delay between 2005 and 2007 was much less severe than the increase experienced between 2004 and 2006. As was reported in last year's annual congestion report, comparing 2004 and 2006, overall delay on the central Puget Sound freeways increased by nearly 35% relative to maximum throughput speeds and by 20% relative to the posted speed limits.

Individual corridors experienced increases in delay ranging from 6% to 13% relative to posted speeds, and between 3% and 28% relative to maximum throughput speeds. Relative to posted speeds, I-90 saw the largest increase in delay at 12.6% between 2005 and 2007. Relative to maximum throughput speeds, SR 167 saw the largest increase in delay during this same time period at 28%. Because the lengths and widths of these corridors are different, it is not meaningful to compare and rank the corridors. The higher percentage increase relative to the maximum free flow speed indicates some of the most congested freeway sections became worse between 2005 and 2007.

Overall, VMT drops slightly in the central Puget Sound

Vehicle miles traveled (VMT) between 2005 and 2007 has dropped slightly overall in the central Puget Sound. This is a continuing trend seen in the prior two annual congestion reports. Increased travel demand associated with population and job growth from 2005 to 2007 may have been offset by rising gas prices that had the effect of dampening travel demand. The slight increase in travel delay in the absence of obvious VMT increases perhaps can be explained by the impacts from increased construction activities during the time period.

Central Puget Sound freeways: average weekday delay comparison, 2005 and 2007

		Vehicle hours of delay per day								
		Relative to posted speed limit (60 mph)			Relative to maximum throughput speed (approx. 51 mph)			Vehicle miles travelled[1] (in thousands)		
State Route	Lane Miles	2005	2007	% Δ 2005 vs. 2007	2005	2007	% Δ 2005 vs. 2007	2005	2007	% Δ 2005 vs. 2007
I-5	369	18,752	19,802	+5.6%	9,478	10,284	+8.5%	7,524	7,385	-1.8%
I-90	95	2,156	2,427	+12.6%	795	817	+2.8%	1,686	1,759	+4.4%
SR 167	41	2,660	2,916	+9.6%	957	1,223	+27.8%	997	970	-2.7%
I-405	152	13,108	14,421	+10.0%	7,753	8,841	+14.0%	3,640	3,605	-1.0%
SR 520	52	3,020	3,340	+10.6%	1,808	2,020	+11.7%	1,008	1,028	+1.9%
Total	709	39,696	42,905	+8.1%	20,791	23,184	+11.5%	14,856	14,749	-0.7%

Source: WSDOT Urban Planning Office.

Note: Because both the lengths and widths of these corridors are different, it is not possible to use the delay numbers to rank the corridors.

[1] VMT for delay was calculated differently than the VMT in the travel time analysis on pp. 18-31: VMT for delay looks at daily VMT, while the travel time analysis looks at peak period VMT; the delay article examines individual corridors while the travel time analysis examines commutes which can include multiple corridors; and the delay article examines VMT for all weekdays, while the travel time analysis looks at VMT for Tuesday-Thursday.

What WSDOT is doing to fight congestion: Add Capacity Strategically

WSDOT's program for addressing congestion is *Moving Washington*—a three part strategy comprised of adding highway capacity strategically, operating the system more efficiently, and managing demand. WSDOT performs before and after studies to assess the effectiveness of *Moving Washington* projects and strategies in reducing congestion and to report their impacts to the public. In April 2008, Governor Gregoire challenged WSDOT to broaden its reporting of Nickel and TPA project outcomes important to Washington citizens, specifically, measuring the results from the driver's perspective for each completed project. This includes measuring congestion benefits.

Moving Washington

Add Capacity Strategically

As our state continues to grow, it is necessary to develop additional traffic capacity. To get the most from limited resources, WSDOT plans projects wisely by targeting the worst traffic-flow chokepoints and bottlenecks in our system. The following project examples show that this strategy is working to ease congestion.

Delivering congestion relief on state highways: Benefits of the 2003 and 2005 funding packages

Highway mobility projects funded by the 2003 and 2005 transportation funding packages include 116 projects statewide valued at over $10 billion, of which 35 have been completed. In the central Puget Sound alone, WSDOT has delivered 22 congestion relief projects valued at over $1 billion as of 9/30/2008. However, much more work remains to be done:

- 19 projects worth $1.4 billion are currently under construction.
- 14 projects worth $1.5 billion will be advertised by this same time next year.

These projects are having an impact: a study of 21 completed Nickel and TPA projects statewide save over 6,400 hours in combined travel times per day – a 10% improvement after construction was completed. These 21 projects, shown in the graph on the next page, do not include all completed mobility projects, but are limited to those with the data needed to perform the analysis. Highlights include the following projects:

I-405/SR 520 to SR 522 - Widening (King Co.)

This $82 million project, the first of the multi-stage Kirkland Nickel project, was completed in October 2007. This project added northbound lane from NE 70th Street to NE 124th Street and a southbound from SR 522 to SR 520.

Result: Based on travel speeds before and after the project was completed, drivers' speed have increased by 16%, from 37 mph to 43 mph.

SR 161/Jovita Blvd to S 360th St, Stage 2 (King Co.)

This project widened SR 161 to five lanes through the commercial area between Milton and Military Road in Federal Way, and to four lanes in residential areas in order to reduce congestion and accidents. This $26 million project was completed in July 2006.

Result: Speeds improved 133% from 15 mph before construction, to 35 mph. The project saves drivers an estimated 625 vehicle hours per day in travel times, a 34% improvement.

SR 24/I-82 to Keys Rd - Add Lanes (Yakima Co.)

This $50 million project was completed in June 2007, and added a lane to SR 24 (from I-82 to Riverside Road), reconstructed the SR 24/Nob Hill Boulevard interchange, and built a new, wider bridge over I-82 and the Yakima River.

Result: Drivers' travel speeds have improved 22% from 35 mph to 45 mph.

I-5/Salmon Creek to I-205 - Widening (Clark Co.)

This $44 million project, completed in October 2006, widened two miles of I-5 in Clark County to six through lanes, plus an extra lane in each direction between interchanges. In addition, the NE 129th Street overpass and the Salmon Creek/NE 117th Street bridges were replaced with structures that meet current design, safety and seismic standards. This project was one of several aimed at improving traffic flow in the I-5 corridor between the Main Street interchange in Vancouver and the I-205 junction.

Result: Speeds have improved 19% from 42 mph to 50 mph.

SR 9/SR 522 to 228th St SE, Stages 1a and 1b - Add Lanes (Snohomish Co.)

To improve safety and reduce congestion and the number and severity of accidents, this $25 million project widened SR 9 to four or five lanes from SR 522 to 228th Street SE, widened the westbound on-ramp to SR 522 to two lanes, and installed one new traffic signal and upgraded two existing signals.

Result: The project was completed in November 2007, and improved drivers' speed from 18 mph to 40 mph – a 122% increase.

I-90/Argonne Rd to Pines Rd and I-90/Pines Rd to Sullivan Rd – Add Lanes (Spokane Co.)

These projects added an additional lane in each direction of I-90 between Pines Road and Sullivan Road to reduce congestion on this major freight route.

Result: These two projects, worth $33.7 million, were delivered in November 2005. Upon completion, they improved travelers' speeds by 22% and travel times by 11%.

What WSDOT is doing to fight congestion: Add Capacity Strategically

Before and After analysis of 21 selected Nickel and TPA congestion relief projects statewide

Dollars in thousands.

		Estimated minimum speed (MPH)			Vehicle hours per day		
	Cost	Before	After	% Δ	Before	After	% Δ
SR 240/I-182 to Richland Y - Add lanes (Benton Co.)	$22,616	30	38	27%	2,114	1,888	-11%
SR 240/Richland Y to Columbia Center I/C - Add lanes (Benton Co.)	$43,159	42	50	19%	1,105	1,012	-8%
I-5/Salmon Creek to I-205 - Widening (Clark Co.)	$43,951	42	50	19%	2,817	2,502	-11%
SR 17/Pioneer Way to Stratford Rd - Widen to four lanes (Grant Co.)	$21,025	43	47	11%	810	736	-9%
I-5/NE 175th St to NE 205th St - Add northbound lane (King Co.)	$8,733	35	35	0%	2,219	2,037	-8%
SR 161/Jovita Blvd to S 360th St, Stage 2 - Widen to five lanes (King Co.)	$26,159	15	35	133%	1,819	1,194	-34%
I-405/SR 520 to SR 522 - Widening (King Co.)	$81,762	37	43	16%	34,862	32,081	-8%
I-90/Highline Canal to Elk Heights (Kittitas Co.)	$4,961	51	52	2%	918	891	-3%
I-90/Ryegrass Summit to Vantage (Kittitas Co.)	$9,615	55	56	1%	2,672	2,623	-2%
SR 161/204th St to 176th St - Widen roadway (Pierce Co.)	$15,264	30	42	40%	1,593	1,274	-20%
SR 161/234th St to 204th St E - Add lanes (Pierce Co.)	$15,634	36	44	24%	962	831	-14%
SR 9/SR 522 to 228th St SE, Stages 1a and 1b - Add lanes (Snohomish Co.)	$24,471	18	40	122%	649	478	-26%
SR 9/228th St SE to 212th St SE (SR 524), Stage 2 - Add lanes (Snohomish Co.)	$31,319	28	41	46%	577	470	-19%
SR 527/132nd St SE to 112th St SE - Add lanes (Snohomish Co.)	$20,528	43	45	5%	592	575	-3%
I-90/Pines Rd to Sullivan Rd - Add lanes (Spokane Co.)	$15,821	38	46	22%	3,731	3,326	-11%
I-90/Argonne Rd to Pines Rd - Add lanes (Spokane Co.)	$17,844	38	46	22%	3,090	2,752	-11%
US 12/SR 124 to McNary Pool - Add lanes (Walla Walla Co.)	$12,091	47	55	18%	915	809	-12%
US 12/Attalia Vicinity - Add lanes (Walla Walla Co.)	$16,200	53	57	9%	250	236	-6%
SR 270/Pullman to Idaho State Line - Add lanes (Whitman Co.)	$31,188	39	53	37%	1,778	1,522	-14%
SR 24/I-82 to Keys Rd - Add lanes (Yakima Co.)	$50,233	37	45	22%	710	498	-30%
SR 543/I-5 to Canadian Border - Add lanes (Whatcom Co.)	$50,806	39	46	18%	154	139	-10%
Total					**64,336**	**57,874**	**-10%**

*Dollars in thousands

Note: Volume information is based on traffic counts and speed information is based on modelled data. These 21 projects are those completed mobility projects with the necessary data to support a Before and After analysis. WSDOT received funding to purchase additional equipment to perform a greater number of and more precise Before and After studies in the future, and began actively collecting data this summer.

What WSDOT is doing to fight congestion: Add Capacity Strategically

I-5 – Everett, SR 526 to US 2 HOV lanes

I-5 in Everett between SR 526 and US 2 was a major traffic chokepoint, prone to rear-end collisions when the highway and ramps backed-up. To relieve congestion and improve safety, WSDOT extended the northbound and southbound HOV lanes, modified the I-5/41st Street interchange, added an auxiliary lane, and built a direct access ramp.

In the northbound direction, six miles of high occupancy vehicle (HOV) lane was constructed from near Highway 526 to US 2. Over four miles of HOV lane were added in the southbound direction from Marine View Dr. to near Highway 526. These HOV lanes were completed in June 2008. A general purpose lane was added in each direction from 41st Street to US 2.

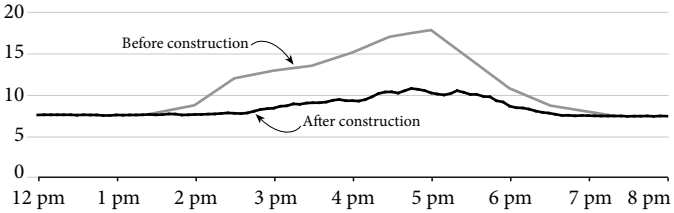
The interchange at 41st Street was redesigned as a "single point urban interchange" (SPUI), where through traffic and freeway on and off-ramp traffic is controlled by a single signal. Embedded traffic loops/sensors and seventeen new traffic cameras were installed. Nine ramp meters were added to new and existing ramps in the area to further improve traffic flow.

The previous left-side ramps at Broadway Ave. were modified to an HOV direct access interchange and were opened to traffic in June 2008. The direct access ramps connect the new HOV lanes directly with Broadway, thus reducing the need to weave though three lanes of traffic. More than 2,500 HOVs use the ramps each day, including five transit routes.

Southbound traffic during the morning peak saw an increase of average speed from 25 mph to free flow speeds in the two mile stretch north of 41st Street. General purpose travel times improved by 2-4 minutes heading southbound in the morning commute. During the evening peak, northbound general purpose traffic has seen benefits of 5-9 minutes through the eight mile stretch of I-5 between 128th St. and Marine View Drive. The graph below shows northbound general purpose travel times before and after construction through the evening hours.

I-5 in Everett: northbound travel times

128th St. to Marine Drive (8 miles)
Travel times (mins.)



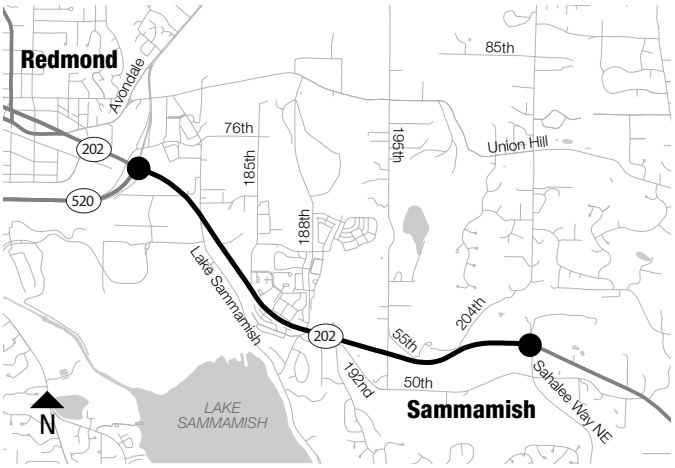
Data Source: WSDOT Northwest Region Traffic Office.

This project has provided a necessary increase in capacity on I-5, a reduction in traffic congestion, and is expected to improve safety by reducing congestion-induced rear-end collisions.

SR 202 – SR 520 to Sahalee Way widening

Commuters driving between downtown Redmond and the Sammamish Plateau via SR 202 have faced heavy congestion for more than a decade. One lane in each direction was not enough to accommodate the tens of thousands of vehicles that were using it each day. This project addressed the needs of this growing area by widening almost three miles of SR 202 from SR 520 to Sahalee Way NE, building a flyover ramp connecting westbound SR 202 to westbound SR 520 and coordinating signal timings along the corridor.

SR 202 project location



One lane was added in each direction to widen SR 202 from SR 520 to Sahalee Way NE. This doubled the capacity of the highway, resulting in saving drivers time and frustration. The westbound lanes carry nearly 500 more cars per hour than before the construction.

The flyover ramp connecting westbound SR 202 to westbound SR 520 avoids long queues at the left turn bay on-ramp signal by allowing drivers to directly access SR 520. The ramp eliminates the chokepoint on SR 202 and NE 76th St and reduces collisions caused by drivers running the red light through the intersection. An additional 500 vehicles per hour now enter onto westbound SR 520 from westbound SR 202, bringing the peak volume on the ramp to 2500 vph. The images on the following page show the intersection of SR 202 and SR 520 before and after construction of the flyover ramp.

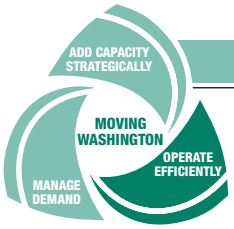
What WSDOT is doing to fight congestion: Operate Efficiently

WSDOT and the city of Redmond coordinated efforts to synchronize all nine signals along the widened portion of SR 202. The results caused reduced travel times during peak congestion times from SR 520 to Sahalee Way NE and vice versa.

These combined projects have greatly improved congestion and safety along SR 202 between SR 520 and Sahalee Way. There have been observed benefits of up to 20 minutes of travel time savings during peak hours between downtown Redmond and the Sammamish Plateau.

Before: SR 202 at SR 520 was a major chokepoint prior to construction.

After: Drivers see benefits of up to 20 minutes of travel time savings during peak hours between downtown Redmond and the Sammamish Plateau.



Moving Washington

Operate Efficiently

Efficiency means taking steps to smooth traffic flow and avoid or reduce situations that constrict road capacity. Collisions account for at least 25% of traffic backups, so making our roads safer will go a long way toward easing congestion. Technology, such as driver information signs, enables WSDOT to react quickly to unforeseen traffic fluctuations. Among the tools that provide this efficiency are metered freeway on-ramps, incident response teams, variable speed-limit systems, variable tolling and integrated traffic signals.

SR 167 HOT Lanes

The state's first-ever high occupancy toll (HOT) lanes opened to SR 167 drivers on Saturday, May 3, 2008. This four-year pilot project, located in south King County, provides a new option for solo drivers on SR 167, while WSDOT can evaluate how effectively HOT lanes and variable tolling can improve traffic flow and ease congestion.

A single HOT lane runs in each direction of SR 167 for approximately nine miles between Renton and Auburn. The highway's two general purpose lanes in each direction remain toll-free and open to all vehicles.

Carpools of two or more people, vanpools, transit and motorcycles use HOT lanes toll-free as they do with standard HOV lanes, and they do not need a transponder. HOT lanes operate daily between 5 a.m. to 7 p.m.

Toll rates automatically increase and decrease with the level of congestion to ensure that traffic in the HOT lane always flows smoothly, so that buses and carpools enjoy the same fast and reliable trip they depended on in SR 167's HOV lanes before the lanes were converted to HOT lanes.

This summary includes data from the first three months of HOT lanes operations, May 3 through July 31, 2008.

- Drivers paid an average of $1 to save 10 minutes of travel-time during the peak-hour commutes.
- Travel times for carpools and transit have been maintained.
- There is room in the HOT lane for additional carpool vehicles, transit, or toll-paying solo drivers.
- Collisions did not measurably increase or decrease.
- The average number of peak-hour toll transactions has increased each month.

What WSDOT is doing to fight congestion: Operate Efficiently

The HOT lanes still have capacity for additional vehicles; just short of 1,000 total vehicles per hour are using each HOT lane during the peak hour. Because each lane has the capacity to move more than 1,400 vehicles per hour without becoming congested, roadway space exists for transit, carpool vehicles and toll-paying solo drivers.

SR 167 HOT Lanes average weekday performance by month

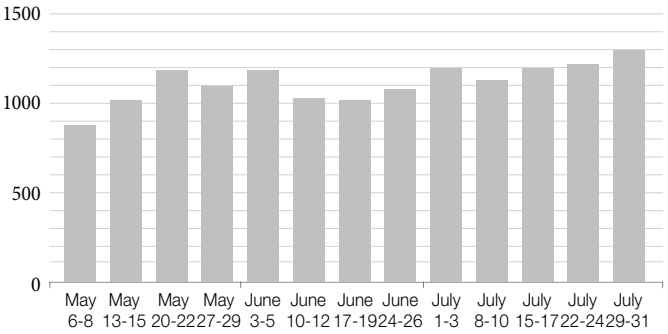
Tuesday -Thursday	May 2008	June 2008	July 2008
Average toll paid	$1.00	$1.25	$1.00
Highest toll paid	$5.75	$9.00	$9.00
Average number of daily toll trips	1,050	1,080	1,210
Highest number of daily toll trips	1,220	1,260	1,390
Daily northbound toll trips	580	590	680
Daily southbound toll trips	470	490	570
Average peak-hour toll trips	100	140	160

Source: WSDOT Northwest Region Traffic Office.

Travel time performance

WSDOT measured travel times in the three-month period for the HOT and general purpose lanes on SR 167. The HOT lanes do not run the full length of the corridor between Auburn and Renton, so HOT lanes travel times in this report were calculated using the lengths of the HOT lanes (11 miles Northbound, eight miles southbound) plus additional travel in the general purpose lanes. This analysis shows that average travel times between the two cities in using the HOT lanes in about 40% faster than in the general purpose lanes only; 95% reliable travel times are 45%-57% faster.

SR 167 HOT lanes average daily tolled trips
May-July, 2008



Source: WSDOT Northwest Region Traffic Office

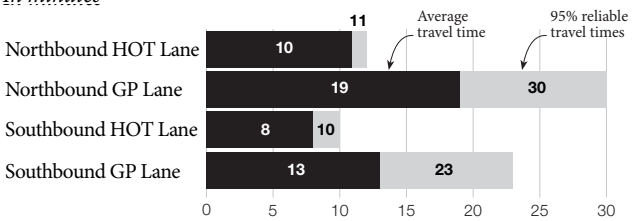
Corridor Performance

One anticipated benefit of HOT lanes was an increase in the overall efficiency of the SR 167 corridor. The HOT lanes have not been open long enough for definitive conclusions to be reached, and the contractor is currently evaluating corridor performance. Performance updates on the SR 167 HOT lanes pilot project will be reported in upcoming editions of the *Gray Notebook*. Some preliminary performance results include:

- During the morning peak-hour for the first three months of operation, northbound toll customers accounted for nearly four percent of the SR 167 traffic. Toll customers accounted for three percent of the afternoon peak-hour commuters.
- Transit and carpool vehicles continue to operate at free-flow speeds greater than 90% of the time.

For more information about the SR 167 HOT Lanes pilot project, please see: http://www.wsdot.wa.gov/Projects/SR167/HOTLanes/VariableTolling.htm

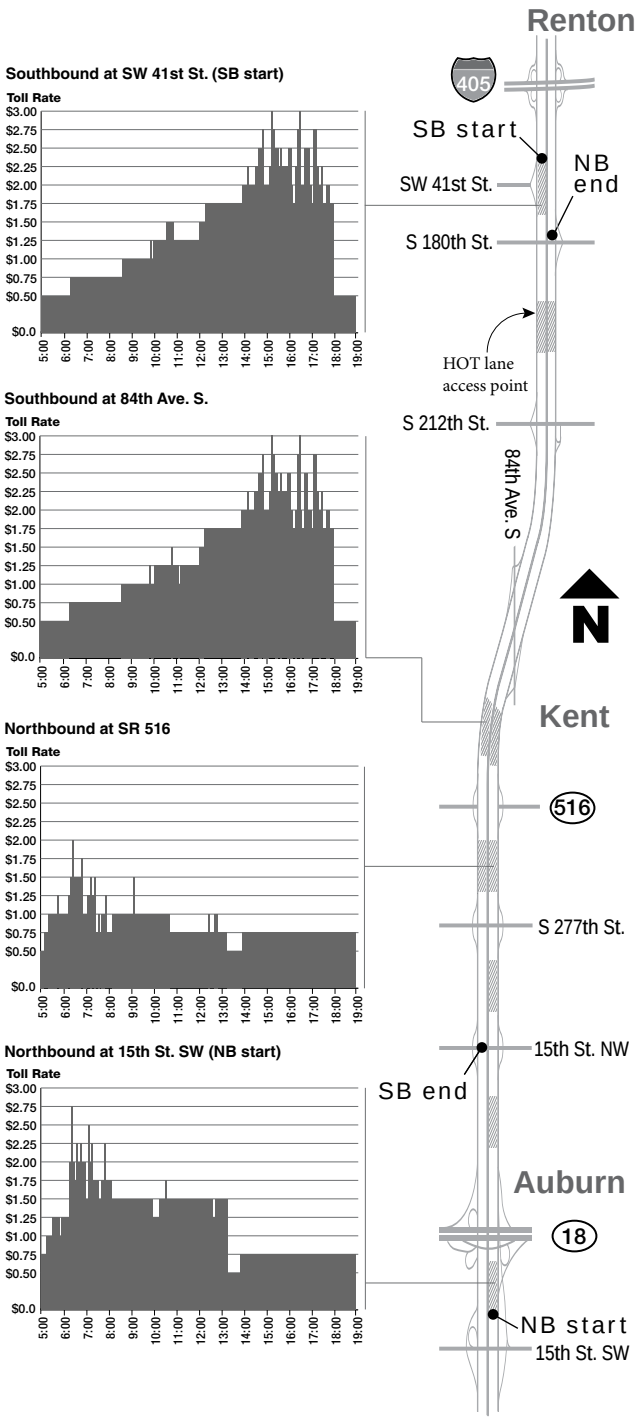
SR 167 travel times: HOT lanes vs. GP lanes
Average and reliable peak hour travel times for May 2008 - July 2008
In minutes



NB travel times were calculated from SR 18 (MP 14.31) to S. 34th St. (MP 25.07)
SB travel times were calculated from S. 34th St. (MP 25.07) to 43rd St. NW (MP 17.38)
Peak hour used: 7:00 - 8:00 am for NB and 4:00 - 5:00 pm for SB
Data used: May - July 2008, Monday - Friday
Data Source: NW Region Traffic Operations.

What WSDOT is doing to fight congestion: Operate Efficiently

SR 167 HOT lanes: average daily toll rates at selected HOT lane access points



Source: WSDOT Northwest Region

SR 522 signal retiming

Signal coordination is a technique used to move vehicles through a series of signalized intersections in the shortest amount of time by timing the signals to work together so that vehicles make the least number of stops. The SR 522 corridor is an important route that carries an average of 60,000 vehicles per day and connects northeastern King County cities with Seattle. It is also an alternate route around Lake Washington opposed to crossing the SR 520 or I-90 bridges. The SR 522 corridor from NE 153rd St. to 83rd Pl. NE was analyzed and nine signals were retimed. The following graphs at the bottom of this page show the before and after trip times through the corridor.

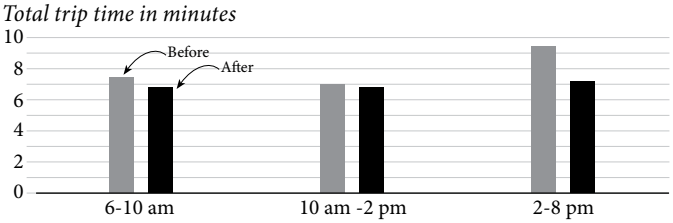
After retiming, peak period travel times generally decreased in both directions, with the exception of westbound morning traffic, when travel times increased 2.5 minutes between 7:00 am and 8:00 am. This increase, plus the fact that westbound morning travel times remained fairly constant at about 6.5 and 7 minutes, raised the average westbound trip time slightly, as shown in the graph.

During the morning peak in the eastbound direction, overall trip time decreased by an average of 30 seconds with the largest savings (up to 1.5 minutes) between 6:00 am and 7:00 am. The eastbound midday peak saw a 15 second decrease in trip time during the 10:00 am-2:00 pm period, and the westbound traffic saw an average decrease of 30 seconds. The eastbound afternoon peak saw the largest decrease in travel time overall with an average of over 2 minutes. From 4:00 pm-5:00 pm, trip time decreased by as much as 3.5 minutes. Westbound traffic during

SR 522 signal re-timing Before and After results

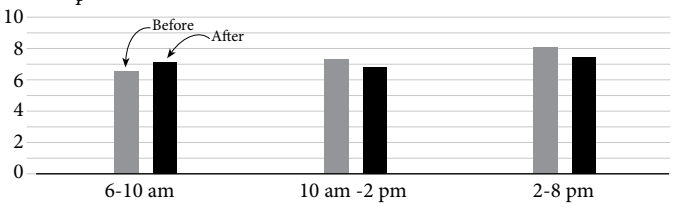
Eastbound SR 522 Before and After coordination trip time through nine intersections

Total trip time in minutes



Westbound SR 522 Before and After coordination trip time through nine intersections

Total trip time in minutes



Data Source: WSDOT Northwest Region Traffic Office.

What WSDOT is doing to fight congestion: Operate Efficiently

this time also saw a decrease in trip time on average of 1 minute, with up to 3 minutes of savings between 3:00 pm and 4:00 pm. Overall, updated signalization along SR 522 between NE 153rd St and 83rd Pl NE has decreased trip times through the corridor.

Direct access ramp performance update

HOV lane users save up to 8 minutes using direct access ramps

WSDOT has been building high occupancy vehicle (HOV) lane direct access ramps throughout the Puget Sound area for Sound Transit, with the first opening in the fall of 2004. The following analysis provides an update on how direct access ramps are performing, which was last reported in the September 30, 2006, *Gray Notebook*. Direct access ramps allow buses, carpools, and vanpools to directly access the HOV lanes from park and ride lots and local streets. Direct access ramps eliminate weaving across the general purpose lanes by carpools, vanpools, and buses. Direct access ramps improve safety, reduce congestion, save time, and increase reliability for both HOVs and general-purpose traffic.

Ten major HOV lane direct access ramps in the Puget Sound area have opened in the past few years. Ten more direct access ramps are planned. The map on the next page shows the locations of direct access ramp projects, completed and planned.

Preliminary performance evaluations have been completed for each of the complete direct access ramps. Substantial savings have been achieved allowing Sound Transit and Community Transit to adjust their transit schedules. Travel time savings at the Federal Way direct access ramps are not available because the opening of the new park and ride has rerouted buses, so current routes cannot be compared to routes before the construction of the direct access ramps. The table below shows the weekday volume of buses and total vehicles along with the travel time savings at each direct access ramp.

Direct access ramp volumes and travel time savings

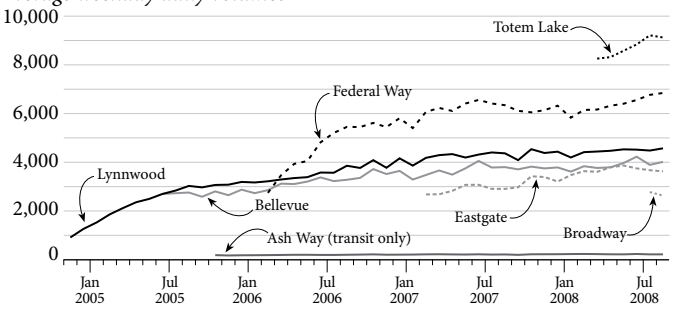
Location	Transit Daily Volume	Total Daily Volume	Time Savings
Lynnwood	212	4,570	4-8 minutes
Bellevue	334	4,020	1-2 minutes
Ash Way*	129	220	2-6 minutes
Federal Way	257	6,850	N/A
Eastgate	293	3,630	5-6 minutes
Totem Lake	303	9,130	2-6 minutes
Broadway	126	2,630	3-7 minutes

Source: WSDOT Northwest Region Traffic Office
*Transit only traffic.

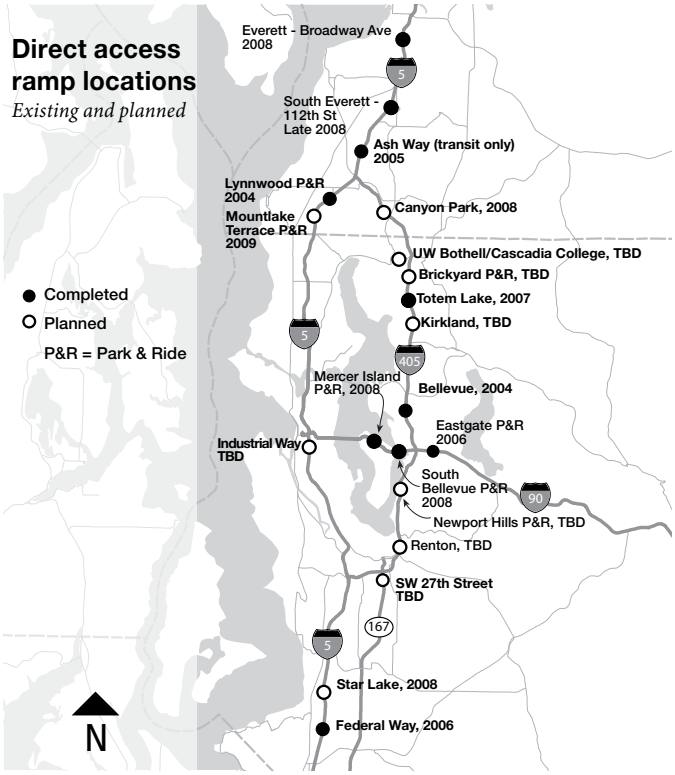
The graph below shows the steady and in some cases rapid growth of the direct access ramps upon their opening. Currently, the Lynnwood direct access ramps carry approximately 4,600 vehicles per day, Bellevue carries 4,000 vehicles, Federal Way carries 6,800 vehicles, Eastgate carries 3,800 vehicles and the Broadway ramps in Everett opened to about 2,600 vehicles per day. The Totem Lake ramps lead with carrying up to 9,000 vehicles per day, but there has been speculation of high numbers of HOV violation. The Ash Way ramps, which are restricted to transit vehicles, carry approximately 200 vehicles per day.

Direct access ramp volumes

Average weekday daily volumes



Data Source: Northwest Region Traffic Office.



What WSDOT is doing to fight congestion: Intelligent Transportation Systems

Intelligent Transportation Systems are a key component of Moving Washington

Operating our highways efficiently is one of the three *Moving Washington* strategies WSDOT uses to fight congestion. One element of operating efficiently is using Intelligent Transportation Systems (ITS)—a set of technology-based tools for smoothing traffic flows, managing situations such as collisions that constrict traffic, and providing information to the traveling public. ITS relies on a technology infrastructure that runs parallel to the state highway network. Key ITS elements include:

- ***Communications Backbone***–The backbone of ITS is a communication system composed of radio, microwave and fiber optics elements that touches most sections of the highway network. The backbone provides radio communications for those maintaining the roads and data transmission for those managing the roads. The data that is transmitted over the system comes from many ITS elements that are part of our overall traffic management efforts.
- ***Traffic cameras***–Closed-circuit television cameras across the state help WSDOT detect congestion and accidents and be constantly aware of traffic and road conditions. The camera images are shared with other agencies such as the Washington State Patrol, and sent to our traffic management centers and emergency responders for operations monitoring, to the web for travelers, and to the media.
- ***Variable message signs***–A variable message sign is an electronic traffic sign used on roadways to provide motorists with important information about traffic congestion, incidents, roadwork zones, travel times, special events, or speed limits on a specific highway segment. They may also recommend alternative routes, limit travel speed, warn of duration and location of problems, broadcast AMBER Alerts, or simply provide alerts or warnings.
- ***Highway advisory radios***–Highway advisory radios are licensed low-power AM radio stations installed along the roadway to provide alerts and general information regarding traffic and travel.
- ***Road and weather information systems***–These systems use specialized instruments installed along highways to detect weather and road surface condition observations. This information is used to guide decisions on maintenance strategies and to provide information to drivers.
- ***Ramp Meters***–Ramp meters are traffic signals on freeway on-ramps that control the flow of vehicles entering the freeway mainline. Metering rates are automatically adjusted based on prevailing freeway traffic conditions.
- ***Traffic Data Detectors***–These instruments track traffic flow on highways. The most common detector is the induction loop, a low-voltage wire coil buried in the roadway that creates an electrical pulse when a vehicle passes over it. Other, less common instruments use infrared, radar, sound, or video imaging to detect vehicles.
- ***Traffic Management Centers***–WSDOT operates seven regional traffic management centers—the nerve centers for WSDOT's operations activities. Real-time information is gathered 24 hours a day, 7 days a week from the ITS components above as well as the Washington State Patrol, road crews, incident response teams, and media traffic reporters. WSDOT uses this information to operate the highway system, coordinate responses to clear incidents, and notify the public and the media of these events.

Number of CCTVs, variable message signs, and traffic data stations increase

The overall number of closed-circuit television cameras (CCTVs) increased because many new cameras were added in the Seattle area, and, in some cases, existing devices that had not previously been recorded were added to the database.

WSDOT added 24 traffic detection devices, mostly on I-5 from the King County line to Tumwater. This information is now in the flow maps available on WSDOT's traffic website: http://www.wsdot.wa.gov/traffic. The number of variable message signs (VMS) increased from 165 to 181 because WSDOT added several VMSs in Olympia and I-90 in Seattle.

ITS elements inventory

As of October 2008, WSDOT owned elements and WSDOT maintained elements

Device Type	Number of Devices or Sites 2007[1]	2008	Approximate Cost per Device or Site
Closed Circuit Television Cameras	521	542	$15,000-$30,000
Variable Message Signs (VMSs)	179	181[3]	$100,000
Highway Advisory Radio Transmitters	70	72	$50,000
Road/Weather Information Systems	94	97	$25,000-$50,000
Metered Ramps	137	137	$10,000-$100,000
Traffic Data Stations	530	554	$10,000-$20,000
Traffic Management Centers (TMCs)[2]	8	8	N/A

Data Source: WSDOT Traffic Operations Office.

[1] Some local cities and counties pay WSDOT to maintain their CCTVs and VMSs. The 2007 numbers in last year's report included both WSDOT-owned and WSDOT-maintained elements. 2008 numbers reflect only WSDOT-owned elements.

[2] This includes one winter operations site at Snoqualmie Pass.

[3] Last year's number included 14 inactive signs. This year's number does not include inactive signs. These signs are not scheduled to be repaired and used again.

What WSDOT is doing to fight congestion: Intelligent Transportation Systems

Planning for the future of ITS in Washington

WSDOT's current and future initiatives to expand and improve ITS are described in its 2009-15 Strategic Plan: Business Directions, available on WSDOT's website at http://www.wsdot.wa.gov/Accountability/PerformanceReporting/StrategicPlan.htm.

WSDOT prepares new ITS plan

WSDOT's statewide ITS plan identifies the near- and long-term ITS improvements necessary to meet the objectives and strategies identified in WSDOT's 2009-2015 Strategic Plan and in the congestion-fighting program Moving Washington.

Several key improvements have been identified. The plan calls for expanding ITS communication capabilities for delivering real-time information to the traveling public. It also recommends installing new ITS field devices and adding incident response vehicles in areas without current coverage, and the replacement of aging devices that are becoming obsolete. Meanwhile, upgrading the two Traffic Management Centers in the Seattle and Tacoma areas will help in managing traffic demands. Finally, the plan recommends implementing Active Traffic Management techniques such as those discussed in the September 30, 2007 *Gray Notebook* (p. 82), including the variable speed limits described on this page. The plan is currently in draft form and will be published soon.

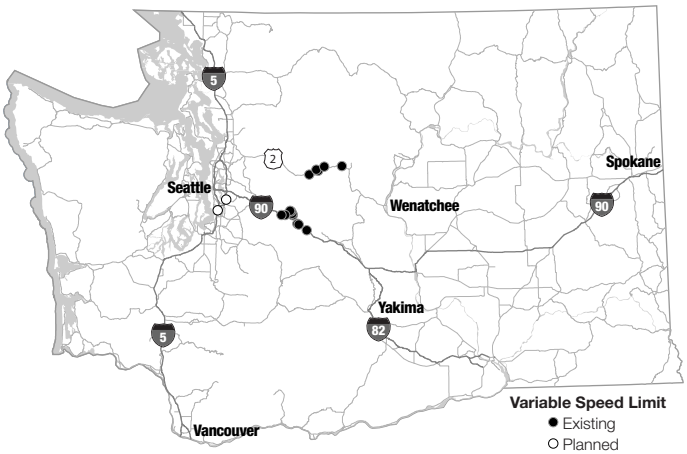
ITS supports Active Traffic Management

Active Traffic Management (ATM) expands the use of ITS technology to dynamically manage traffic based on the prevailing conditions. WSDOT is studying ways to use ATM to improve traffic flow and is testing new techniques to manage traffic on the region's busiest routes.

WSDOT is currently using several ATM tools on Washington highways including Variable Speed Limits, Lane Control, and Queue Warning. These signs are intended to slow quickly-moving vehicles when the system has registered the presence of traffic back-ups ahead. This helps prevent collisions that result from drivers running into the back of a queue of vehicles. By reducing collisions, they also improve traffic flow and travel time reliability.

Variable Speed Limit signs are already in use on Stevens and Snoqualmie Pass, and soon Variable Speed Limit, Lane Control, and Queue Warning signs will be in place on SR520 and I-90 as part of the Urban Partnership Agreement, and on I-5 to help mitigate traffic congestion during the replacement of the aging Alaskan Way Viaduct. Based on similar ATM practices already in use in Europe, WSDOT believes that by implementing the variable speed limits and lane control, there will be a drop in collisions by up to 30% which in turn will improve travel flow by 10%.

Locations of variable speed limit signs on WSDOT highways



Data source: WSDOT Traffic Operations

Lake Washington Urban Partnership Agreement

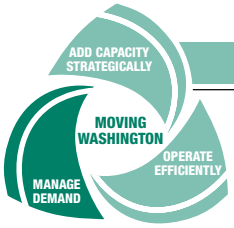
The Lake Washington Urban Partnership is a cooperative agreement among the federal government, WSDOT, King County and the Puget Sound Regional Council to employ innovative traffic management tools for improving traffic flow along State Route 520 and Interstate 90 between Seattle and the Eastside. The four strategies are:

- Transit: Additional transit service and improved peak period frequency including new bus rapid transit facilities and park-and-ride improvements.
- Telecommuting: Emphasized telecommute and travel demand reduction programs with major employers already committed to these strategies.
- Tolling: Electronic tolling on SR520, if approved by the Legislature, will help finance the new bridge and improve throughput, reliability and speed for cars and transit.
- Technology: Technologies, such as Active Traffic Management tools, will improve system efficiency and optimize traffic performance on the SR520 and I-90 corridors by reducing collisions.

U.S./Canada border crossing

In preparation for the 2010 Winter Olympics in Vancouver, B.C., Canada, WSDOT and British Columbia's Ministry of Transportation are now providing real-time border crossing wait times on the web. The website opened earlier this year and can be viewed here: www.wsdot.wa.gov/traffic/border/

What WSDOT is doing to fight congestion: Manage Demand



Moving Washington

Manage Demand

We can make the best use of our highway capacity if we better distribute the demand we place on our most congested bridges and highways. That means offering commuters more choices, such as convenient bus service, incentives to carpool or vanpool, and promoting workplace environments more conducive to telecommuting. Managing demand strategies encourage drivers to use less congested routes and times to travel by displaying real-time traffic information on the Internet and electronic road signs.

Growth and transportation efficiency centers

Expanding trip reduction in urban centers

WSDOT is collaborating with local governments, transit agencies, and businesses to help reduce drive-alone trips and vehicles miles traveled (VMT) in growing urban centers. The new Growth and Transportation Efficiency Center (GTEC) program, which is part of the CTR law, works with businesses to encourage employees to ride the bus, vanpool, carpool, walk, bike, work from home, and use other commute options besides driving alone.

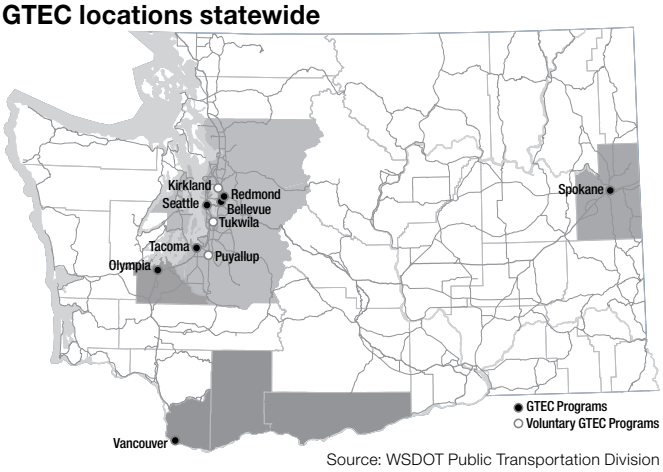
While the existing statewide CTR program focuses on commuters traveling to major employers, GTECs promote the same types of comprehensive commute options programs with an emphasis on smaller employers, residents and students. By working with small businesses, neighborhoods and schools, the program is providing services and incentives to more than 235,000 commuters around the state who are not currently part of a regional CTR program. The goal of the program is to reduce more than 14,000 trips by 2011 that would otherwise be traveling on some of the state's most congested highways. Achieving this goal will mean a reduction of nearly 95 million annual VMT.

The GTEC program is one of WSDOT's *Moving Washington* strategies for reducing traffic congestion by managing demand. Offering more choices to commuters will make the best use of highway capacity by better distributing the demands placed on our roadways. The program will also help communities meet their local goals for growth and economic development, reduce their carbon footprint, improve air quality and public health.

Statewide implementation

Fourteen cities from around the state developed GTEC plans and applied for funding from the Governor's Commute Trip Reduction Board in 2007. The board selected seven GTECs for funding, using the $2.4 million one-time allocation provided in the 2007-2009 Legislative transportation budget. The seven funded GTECs are located in downtown areas throughout the state. These programs are reaching out to small businesses, and providing them with the services and information to help support their employees as they shift to alternative commute modes.

GTEC locations statewide



Source: WSDOT Public Transportation Division

Program strategies

The GTECs provide benefits for the state highway system while supporting local goals and policies to direct growth and economic development into their urban centers. These GTECs are implementing a number of strategies that: provide trip reduction incentives for commuters; ensure investment for increased transit services to meet employer needs; and align local jurisdiction policies to address transportation and land use goals.

Measurement

Like the CTR program, WSDOT will rely on commuter surveys to track progress toward trip reduction and VMT reduction goals in each GTEC. In summer and fall 2008, each of the seven funded GTECs and the three voluntary GTECs distributed surveys and collected baseline data about travelers within the area GTEC. WSDOT will analyze the baseline data from the surveys and will use it as a benchmark to determine future performance of the program in reducing drive-alone trips and VMT.

Next steps

WSDOT will deliver a report on the initial program deployment and recommendations on future funding levels to the legislature by January 2009. The report will include progress reports from the seven programs as well as pertinent baseline data. The initial experience of the program indicates a need for greater levels of technical support and data collection, as well as implementing regional parking management, multimodal concurrency, and the inclusion of GTECs in state, regional, and local funding priorities.

Measuring Delay and Congestion: Moving Washington

WSDOT's balanced strategies to fight congestion

Washington depends on mobility

Effective transportation is critical to maintaining our economy, environment and quality of life. *Moving Washington* is the WSDOT's vision of investments and priorities for the next 10 years. It integrates new capacity, efficiencies, and commute options to address congestion head-on and improve the performance of our state's transportation system. The program's primary objective is mobility, one of the state Legislature's five transportation priorities along with preserving our transportation infrastructure, making the system safe for all, protecting the environment, and practicing sound stewardship.

The transportation improvements outlined here are necessary for us to continue to enjoy all that our state has to offer. From the coastal rain forests of the Olympic Peninsula to the river gorges in the south and east, Washington State is rich with landscapes and a diverse economy. We depend on a reliable trip to work, and we want to spend time with our families when our work is done. Businesses from agriculture and manufacturing to retail and tourism rely on our transportation system. More information on *Moving Washington* can be found at: http://www.wsdot.wa.gov/movingwashington/

Washington drivers are already seeing benefits

The *Moving Washington* 10-year transportation program will improve current traffic conditions and prepare our system for heightened demands in the future. The program includes specific actions that can achieve tangible early results. WSDOT has already started to realize results from the program's strategies with the completion of numerous highway construction projects. Examples of the benefits that these projects are having can be found on pages 42-51. Many more projects are under construction, and drivers will soon see their benefits as well.

What WSDOT is already doing to fight congestion

Building additional highway capacity:

- The 392 construction projects of the 2003 and 2005 transportation funding packages include 116 mobility projects to fight congestion, of which 35 have now been completed.

Using intelligent transportation systems to operate the system more efficiently:

- Traffic cameras
- Traffic management centers
- Variable message signs
- Integrated traffic signals
- Ramp meters
- Traffic data collectors

Providing commute choices to manage demand:

- Vanpools
- Park & rides
- Transit partnerships
- Telecommuting programs
- Commute trip reduction
- HOV/carpooling

The Program

There is no single solution for traffic congestion, that is why WSDOT reduces congestion by focusing on three key balanced strategies, which are the basis for the *Moving Washington* program:

Add Capacity Strategically

As our state continues to grow, it is necessary to develop additional traffic capacity. However, budgetary constraints and other factors mean we cannot simply build our way out of congestion. WSDOT plans projects wisely by targeting the worst traffic-flow bottlenecks and chokepoints in the transportation system. The 2003 and 2005 transportation funding packages include 116 mobility projects that add capacity where it makes the most sense statewide. Washington continues to invest in improvements to I-5, I-405, and SR 520 in the central Puget Sound and US 395 through Spokane, among others around the state.

Operate Efficiently

Efficiency means taking steps to smooth traffic flow and avoid or reduce situations that constrict road capacity. Collisions account for roughly 25% of traffic backups, so making our roads safer will go a long way toward easing congestion. Technology, such as driver information signs, enables WSDOT and the traveling public to react quickly to unforeseen traffic fluctuations. Among the tools WSDOT employs to provide this efficiency are metered freeway on-ramps, incident response teams, variable speed-limit systems, variable tolling, and integrated traffic signals.

Manage Demand

WSDOT seeks to make the best use of highway capacity by better distributing the demand placed on our most congested bridges and highways. That means offering commuters more choices, such as convenient bus service, incentives to carpool or vanpool, and promoting workplace environments more conducive to telecommuting. WSDOT continues to expand its programs to encourage drivers to use less congested routes and times to travel by displaying real-time traffic information through various means including via the Internet and variable message signs.

WSDOT's balanced strategies to fight congestion

Moving Washington: Corridor Performance

The *Moving Washington* program targets congestion on Washington State's busiest corridors. For each corridor, WSDOT utilizes the three strategies to fight congestion: add capacity strategically, operate efficiently, and manage demand. Projects listed are not comprehensive, but are only selected projects for the corridors. For more information on the *Moving Washington* program and the strategic corridors, please see: http://www.wsdot.wa.gov/movingwashington.

Westside Corridor: I-5 between Arlington and Tumwater, SR 99, US 2

Corridor performance highlights

		2005	2007	%Δ
Average Travel Times (minutes)				
I-5 Everett-Seattle (AM)		46	47	+2%
I-5 Seattle-Everett (PM)		44	43	-2%
I-5 Federal Way-Seattle (AM)		43	47	+9%
I-5 Seattle-Federal Way (PM)		36	37	+3%
*Delay**	I-5	18,752	19,802	+5%

Before and After Case Study: I-5 Everett HOV project improves travel times by 5-9 minutes during the evening commute (p. 44).

*Daily hours of delay (in thousands) relative to posted speeds.

Selected congestion relief projects programmed to improve corridor performance:

Add Capacity Strategically

- SR 99 Alaskan Way Viaduct Replacement.
- SR 512 westbound to southbound flyover ramp.
- I-5 HOV lanes Lakewood to Fife.
- I-5/SR 18 westbound to southbound flyover ramp.
- SR 509 connection to Sea-Tac Airport.
- Complete Business, Access and Transit Lanes on SR 99 in Shoreline.
- SR 518 third lane from I-5 to Sea-Tac Airport.
- New HOV lanes on SR 99.
- Interchange reconstruction at SR 531.

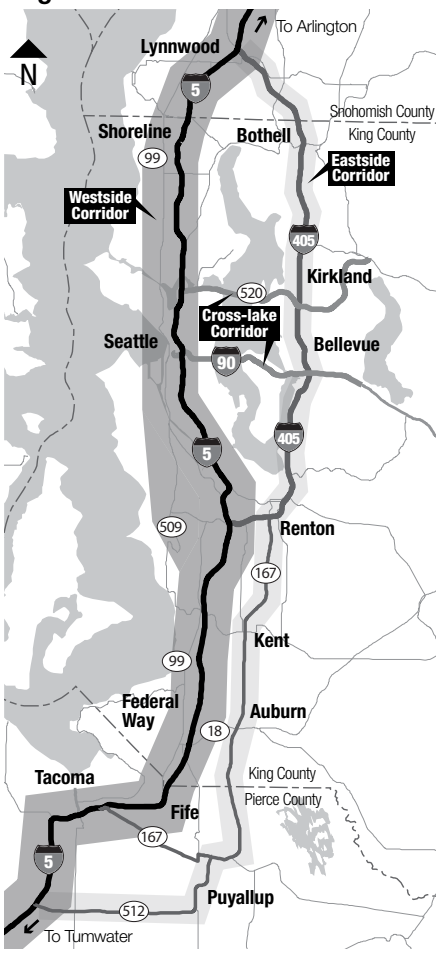
Operate Efficiently

- I-5 Active Traffic Management.
- I-5 Express Lane Tolling.
- Install additional ramp meters.
- Automate operation of reversible lanes.
- Integrate ramp arterial signals.

Manage Demand

- WSDOT provides rights of way and works with transit agencies to improve access and performance.
- Transit uses shoulder during peak periods from Olive Way to SR 520.
- Construct an Industrial Way HOV direct access ramp.
- Further expand the vanpool program in the Central Puget Sound region.
- Expand Park & Ride lot capacity.
- Support established growth and transportation efficiency centers (GTECs).

Moving Washington: Puget Sound Corridors



Cross-Lake Corridor: I-90 and SR 520 between Seattle and Bellevue

Corridor performance highlights

		2005	2007	%Δ
Average Travel Times (minutes)				
I-90 Bellevue-Seattle (AM)		16	17	+6%
I-90 Seattle-Bellevue (PM)		18	17	-6%
SR-520 Bellevue-Seattle (AM)		18	18	0%
SR-520 Seattle-Bellevue (PM)		20	19	-6%
*Delay**	I-90	2,156	2,427	+12%
	SR 520	3,020	3,340	+10%

Before and After Case Study: SR 202 to SR 520 project saves drivers up to 20 minutes during peak periods (pp. 44-45).

*Daily hours of delay (in thousands) relative to posted speeds.

Selected congestion relief projects programmed to improve corridor performance:

Add Capacity Strategically

- SR 520 HOV and Bridge Reconstruction.
- Complete the I-90 HOV and Two Way Transit project.
- Extend the I-90 HOV Lane in Issaquah
- Widen SR 900 in Issaquah by one lane in each direction with HOV lanes.
- Phase 2 of the SR 519 South Seattle Intermodal Access to Port of Seattle.
- New interchange between SR 520 and SR 202.

Operate Efficiently

- I-90 and SR 520 Active Traffic Management.
- Automate operation of the I-90 reversible lanes.
- Direct ramp connection between the new SR 520 HOV Lane and the I-5 reversible lanes.
- Move HOV lanes to the inside on SR 520 east of I-405.

Manage Demand

- Begin variable time-of-day tolling on I-90 at I-5 to I-405.
- Support the implementation of Bus Rapid Transit service on SR 520.
- Increase capacity of Park & Ride lots

Measuring Delay and Congestion: Moving Washington

WSDOT's balanced strategies to fight congestion

Puget Sound Eastside Corridor: I-405, SR 167, and SR 512

Corridor performance highlights

		2005	2007	%Δ
Average Travel Times (minutes)				
I-405 Tukwilla-Bellevue (AM)		38	42	+11%
I-405 Bellevue-Tukwilla (PM)		31	34	+10%
SR-167 Auburn-Renton (AM)		17	18	+6%
SR-167 Renton-Auburn (PM)		18	19	+6%
*Delay**	I-405	13,108	14,421	+10%
	SR 167	2,660	2,916	+10%

Before and After Case Study: SR-167 HOT lanes users save 10 minutes in travel times on average compared to commuters using GP lanes during the peak period (pp. 45-47).

*Daily hours of delay (in thousands) relative to posted speeds.

Selected congestion relief projects programmed to improve corridor performance:

Add Capacity Strategically
- Improve ramp connections on SR 512 at SR 7 and at Canyon Road.
- Extend the SR 167 HOV/HOT Lanes.
- I-405 Corridor Express Lanes.
- Additional Lanes on I-405 in Renton and Bellevue vicinities.
- Build a new freeway connection from the Port of Tacoma to Puyallup.
- New bridge over NE 10th Street in downtown Bellevue.

Operate Efficiently
- I-405/SR 167 Active Traffic Management.
- Use SR 512 shoulders during peak commuting periods as additional lanes.
- Construct an HOV Bypass and signal improvements on SR 169 at I-405.

Manage Demand
- Support the implementation of bus rapid transit service on the I-405 corridor.
- Help identify new GTECs along the SR 167 and I-405 corridors.
- Expand Park and Ride lot capacity.
- Better manage existing Park and Ride lot space.

For more information on the I-405 congestion relief project please see p. 112.

Spokane: I-90 and North Spokane Corridors

Corridor performance highlights

	2005	2007	%Δ
Average Travel Times (min : sec)			
I-90 Argonne-Division (AM)	7:44	8:20	+8%
I-90 Division-Argonne (PM)	8:24	8:10	-3%

Before and After Case Study: Adding lanes on I-90/Argonne Rd to Sullivan Rd improved travelers' speeds by 22% and travel times by 11% (pp. 42-43).

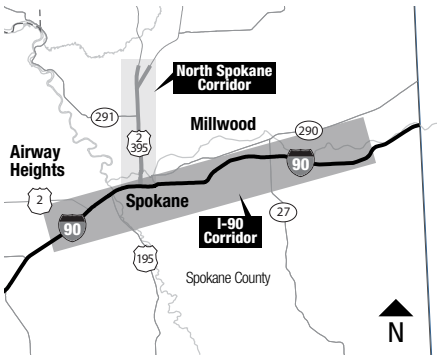
Selected congestion relief projects programmed to improve corridor performance:

Add Capacity Strategically
- US 395 North-South Freeway
- I-90/US 2 interchange eastbound off-ramp and terminal improvements

Operate Efficiently
- Intelligent transportation systems upgrades.
- TMC expansion and security enhancements
- I-90 Sullivan interchange to Idaho state line- enhanced incident response.
- I-90 / Spokane port of entry weigh station relocation.

Manage Demand
- US 195 Hatch Road to I-90 – park and ride facilities.
- North Spokane Corridor–new Park & Ride and pedestrian/bike paths.

Moving Washington: Spokane Corridors



Other Moving Washington corridors: selected congestion relief projects to improve performance

Vancouver Corridors: I-5/I-205 North-South, SR 500, and SR 14

Add Capacity Strategically
- Columbia River Crossing.
- SR 500/St. Johns Blvd.–Interchange.

Operate Efficiently
- Clark Co. and Vancouver signal optimization.

Manage Demand
- Advanced Traffic Information System infill.

Cross-State Corridors: I-90, US 2, and SR 97

Add Capacity Strategically
- I-90 Snoqualmie Pass East Project.
- US 2/US 97 Peshastin East Interchange.
- US 97 Blewett Pass add passing lanes.

Operate Efficiently
- TMC improvements for Yakima and Wenatchee.
- I-90 IRT from North Bend to Spokane.
- US 2 Variable Speed Limit System.

Manage Demand
- Traveler information including flow maps, VMS and web messaging on I-90 and US 2.
- I-90/SR 17 Park & Ride.

Connecting Communities Program

Add Capacity Strategically
- I-82/Valley Mall Blvd - interchange.
- SR 240 Columbia Ctr Blvd to US 395-construct interchange.
- Additional lanes on SR 28 at Sunset Highway.

Operate Efficiently
- SR 17 signal retiming.
- I-5 Lewis County ITS Infill.
- Add Tri-Cities Incident Response Teams.
- SR 21 Ferry Boat replacement.

Manage Demand
- Chuckanut Park & Ride.
- Tri-Cities traveller information enhancements.
- New Park & Ride lots for US 97/SR 970, Alger and Conway.

Summary of WSDOT's congestion performance measures

WSDOT collects real-time data for 52 commute routes in the Puget Sound region and two in Spokane. In the central Puget Sound, data are collected from over 5,000 loop detectors embedded in the pavement of the 709 centerline miles. Using this quality controlled data, WSDOT analyzes system performance by using a variety of performance measures. In tracking and communicating performance results, WSDOT adheres to the congestion measurement principles the agency established. These principles call for the use of accurate, real-time data rather than modeled data in order to better communicate with the public, and using language and terminology that is meaningful to the public ("Plain English").

Measuring speed, travel times, and reliability

Travel times and reliable travel times are important measures to commuters and businesses in Washington State. In addition to reporting on the 38 key Puget Sound commute routes and the two Spokane commutes, this year's congestion annual update looks at travel times for the "other 14" commutes (of the 52 tracked Puget Sound commutes) and for HOV lanes. The metrics used in travel time analysis include the average travel time, 95% reliable travel time, the duration of peak period congestion, and the percent of weekdays when average travel speeds fell below 35 mph. The performance of an individual route is compared to data from previous years.

Real-time travel times for key commutes around Puget Sound, Spokane, and Vancouver are available to the public and updated every five minutes on the WSDOT web site at http://www.wsdot.wa.gov/traffic/seattle/traveltimes/.

Measuring traffic volumes and vehicle miles traveled

WSDOT examines two volume metrics for each commute route: volume during peak hours and the total daily volume. WSDOT continues to analyze factors such as the use of public transportation, population change, job growth, and fuel prices as they relate to volume and travel time changes.

Traffic volume is a vehicle count at a given roadway location. It is measured by a detector in each lane at the location. WSDOT has loop detectors spaced at approximately half-mile intervals throughout the Puget Sound freeway network.

Vehicle miles traveled (VMT) is a metric WSDOT uses to quantify travel along a route. It is simply the vehicle count multiplied by a length of roadway. Because traffic volumes vary along a route, each location's traffic volume is multiplied by the representative length of the route, and these values are added up to obtain a route's VMT. WSDOT uses this measure to better understand the number of trips taken for certain commute routes, as well as total miles traveled on state highways to predict future demands and establish needs.

In 2008, the Legislature established per capita VMT as the primary measure connecting congestion and greenhouse gas emissions.

WSDOT's congestion measurement principles

- Use real-time measurements (rather than computer models) whenever and wherever possible.
- Use maximum throughput as the basis for congestion measures.
- Measure congestion due to incidents (non-recurrent) as distinct from congestion due to inadequate capacity (recurrent).
- Show how reducing non-recurrent congestion from incidents will improve the travel time reliability.
- Demonstrate both long-term trends and short-to-intermediate-term results.
- Communicate about possible congestion fixes using an "apples-to-apples" comparison with the current situation (for example, if the trip takes 20 minutes today, how many minutes less will it be if WSDOT improves the interchange?
- Use "Plain-English" to describe measurements and results.

Key congestion performance measures

Measure	Definition
Average Peak Travel Time	The average travel time on a route during the peak travel period.
95% Reliable Travel Time	Travel time with 95% certainty (i.e. on-time 19 out of 20 work days).
Maximum Throughput Travel Time Index (MT^3I)	The ratio of peak commute period travel time compared to maximum throughput speed travel time
Percent of Days When Speeds Fall Below 35 mph	Percentage of days annually that observed speeds fall below 35 mph (severe congestion) on key highway segments.
Vehicle Throughput	Measures how many vehicles move through a highway segment in an hour.
Lost Throughput Productivity	Percentage of a highway's lost vehicle throughput due to congestion.
Delay	The average total daily hours of delay per mile based on the maximum throughput speed of 51 mph measured annually as cumulative (total) delay.
Duration of Congestion	The period when speeds fall below 70% of the posted limits (41 mph and less).
HOV Lane Reliability	An HOV lane is deemed "reliable" so long as it maintains an average speed of 45 mph for 90% of the peak period.
Person Throughput	Measures how many people, on average, move through a highway segment during peak periods.
Before and After Analysis	Before and after performance analysis of selected highway congestion relief projects and strategies.

Measuring Delay and Congestion: Annual Update

Summary of WSDOT's congestion performance measures, continued

Maximum throughput and evaluating vehicle throughput productivity

WSDOT's goal is to achieve maximum throughput whenever possible. Highways are engineered to move specific volumes of vehicles based on the number of lanes and other design aspects. Many people are surprised to learn that highways do not operate at their maximum efficiency when vehicles are moving at 60 mph (the typical urban highway posted speed limit in Washington State). Maximum throughput, where the greatest number of cars pass through an individual lane every hour, actually occurs at roughly between 42-51 mph (70% and 85% of posted speeds). As congestion increases, speeds decrease and fewer vehicles pass through a corridor. Throughput productivity may decline from a maximum of roughly 2,000 vehicles per lane per hour traveling at speeds between 42-51 mph (100% efficiency) to as low as 700 vehicles/lane/hr (35% efficiency) when traveling at speeds less than 30 mph. For a more detailed discussion of why WSDOT uses maximum throughput as a basis for measuring congestion see the September 30, 2007, *Gray Notebook*, p. 60.

In the 2008 Congestion Report, WSDOT uses maximum throughput as a basis of measurement for the following measures:

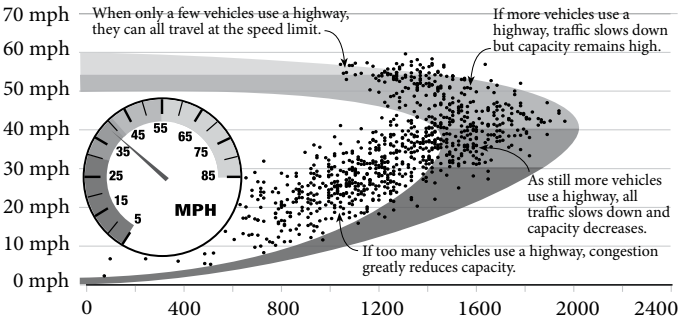
- Lost throughput productivity;
- Maximum Throughput Travel Time Index—MT^3I (For a more detailed discussion of this measure, please see p. 38);
- Duration of Congestion;
- Delay (both statewide and for individual corridors).

Measuring delay

Typically, delay has been calculated based on the difference between actual travel times and posted speed travel times. WSDOT uses maximum throughput standards as the measurement basis, rather than posted speeds, to assess relative delay against the highway's most efficient condition. WSDOT measures delay on the 38 key Puget Sound commute routes, and produces regional calculations of average delay.

An adaptation of the speed/volume curve: relating speed and volume

I-405 northbound at 24TH NE, 6-11 AM weekdays in May 2001
Hourly volume/lane



Measuring HOV lane performance

WSDOT utilizes two measures to evaluate HOV lane performance. WSDOT and the Puget Sound Regional Council adopted a reliability standard for HOV lanes which states that for 90% of the time, HOV lanes should maintain an average speed of 45 mph. This is the basis for WSDOT's HOV reliability measure. WSDOT also measures person throughput to gauge the effectiveness of HOV lanes in carrying more people compared to general purpose lanes. New to this year's congestion annual update, HOV lane travel times are being reported.

Before and after analysis of congestion relief projects

The 2003 Nickel and the 2005 Transportation Partnership Account funding packages provide over $10 billion in funding for 116 congestion relief projects statewide. To measure the extent to which these investments are mitigating congestion, WSDOT is implementing before and after project studies to analyze impacts on travel times and delay. On highway segments without in-pavement loop detectors, data will be collected through the use of automated license plate recognition cameras. Where real-time data are unavailable, modelled data are used. Before and after analysis will be expanded to all congestion relief capacity projects in the coming years.

WSDOT congestion measurement speed thresholds*

Posted speed	Approx. 60 mph	Vehicles are moving through a highway segment at approximately the posted speed. However since there are fewer vehicles on the highway, the highway segment is not reaching its maximum productivity under these conditions.
Maximum throughput speeds	42-51 mph (70%-85% of posted speed)	Vehicles are moving slower than the posted speed and the number of vehicles moving through the highway segment is higher. These speed conditions enable the segment to reach its maximum productivity in terms of vehicle volume and throughput.
Duration of congestion speeds	Under 42 mph (less than 70% of posted speed)	Average vehicle speeds are below 42 mph (70% of the posted speed). Drivers have less-than-optimal spacing between cars, and the number of vehicles that can move through a highway segment is reduced. The highway begins to operate less efficiently because fewer vehicles are moving through a highway segment under these conditions than they would at maximum throughput.
Severe congestion speeds	35 mph or below (Less than 60% of posted speeds)	Speeds and spacing between vehicles continue to decline in a highway segment and highway efficiency operates well below maximum productivity.

*Based on a posted speed limit of 60 MPH.

Incident Response Quarterly Update

Statewide Incident Response

The mission of WSDOT's Incident Response (IR) program is to safely and quickly clear traffic incidents on state highways. Quick clearance minimizes congestion and dangerous traffic blockages that can lead to secondary collisions. IR roving units, which operate during peak traffic periods, also offer a variety of free assistance that reduces motorists' exposure to risk, such as providing fuel and jump starts, changing flat tires, and moving blocking vehicles safely off the roadway. Additionally, IR units are trained and equipped to assist Washington State Patrol (WSP) troopers at collisions and other traffic emergencies. Available for call out 24 hours a day, seven days a week, IR units assist WSP with traffic control, mobile communications, clean-up, and other incident clearance functions as needed during major incidents.

More information on the IR program can be found at www.wsdot.wa.gov/Operations/IncidentResponse/.

Statewide average clearance times: 12.6 minutes for Quarter 3, 2008, up 6.8% from last quarter

In Quarter 3 of 2008, the average clearance time for all incidents statewide was 12.6 minutes, up 6.8% from last quarter's historic low of 11.8 minutes, but this is lower than the range of clearance times for the past three years: 12.9-14.4 minutes. This is especially significant for Quarter 3, which typically has longer clearance times due to the higher traffic demand of the summer months.

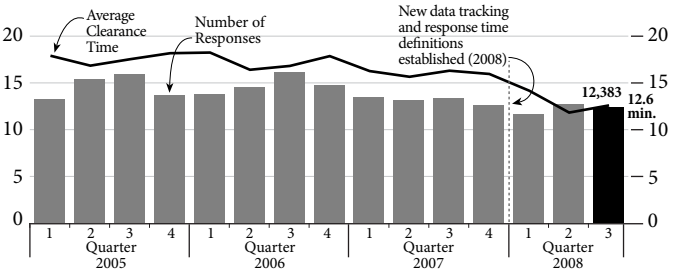
Once again, quicker clearance by IR drivers and lower collision rates contributed to this lower clearance time. WSDOT believes that concerted efforts to quickly clear incidents are beginning to be reflected in the clearance time numbers. Meanwhile, the rate of collisions in the state, including fatal and severe collisions, is dropping, as can be seen in the table on p. 58.

Again this quarter, the proportion of statewide over-90-minute incidents that WSDOT responded to in Quarter 3 of 2008 is relatively low. Fewer long-duration incidents in the data results in a lower average clearance time, because those incidents are not pulling the average up. Over the past two years, over-90-minute incidents represented 1.3% to 1.8% of all quarterly responses. In Quarter 3 of 2008, over-90-minute incidents represented only 1.2% of all incidents that WSDOT responded to. This was up slightly from the 1.0% proportion reported last quarter but again lower than the range for the past two years.

WSDOT responds to 23% fewer fatality collisions statewide compared to the same quarter last year

During Quarter 3 of 2008, WSDOT's Incident Responders attended 27 fatality collisions statewide. This is a 58% increase from last quarter's historic low of 17 responses to fatality collisions, but a 23% drop from the 35 fatality collision responded to in Quarter 3 of last year. This may be attributable to the lower number of fatality incidents that appears to be a recent statewide trend, or it may indicate that IR assistance was not necessary at all fatality incidents.

Number of responses & overall average clearance time
January 2005 - September 2008
Number in thousands, clearance time in minutes



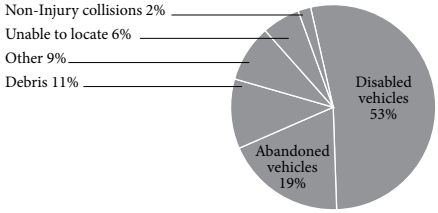
Data Source: Washington Incident Response Tracking System, WSDOT Traffic Office.

Note: Program-wide data is available since January 2002. Prior to Q3 of 2003, the number of responses by IRT are shown. From Q3 2003 to Q2 2007, responses by Registered Tow Truck Operators and WSP Cadets have been reported in the total. From Q1 2002 to Q4 2007, Average Clearance Time do not include "Unable-to-Locate" (UTL) responses into calculation. Average number of responses does include UTLs, because this represents work performed on behalf of the Incident Response Program. In Q1 2008, WSDOT's Incident Response Program moved to a new database system and began calculating average clearance time in a different way. This accounts for the apparent decrease in the average clearance time value.

IR responses to incidents statewide broken out by duration and type of incident
Quarter 3, 2008

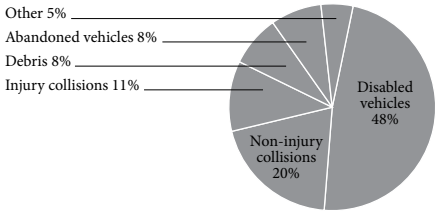
Incidents Lasting Less Than 15 Minutes (9,490)

Fatality, Injury and Police Activity were less than 1% (not shown). There were 16 Fires, 2 Hazardous Materials events involved incidents in addition to or as a result of above incidents. 4 incidents involved WSDOT property damage, and 302 were located in work zones.



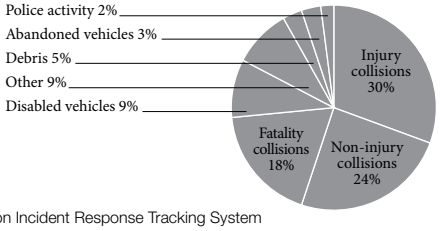
Incidents Lasting 15 to 90 Minutes, (2,746)

Fatality and Police Activity were less than 1% (not shown). There were 8 Hazardous Materials and 72 Fire involved incidents in addition to or as a result of above incidents. 48 incidents involved WSDOT property damage, and 98 were located in work zones.



Incidents Lasting 90 Minutes and Longer (148)

There were 10 Hazardous Materials and 14 Fire involved incidents in addition to or as a result of above incidents. 20 incidents involved WSDOT property damage, and 14 were located in work zones.



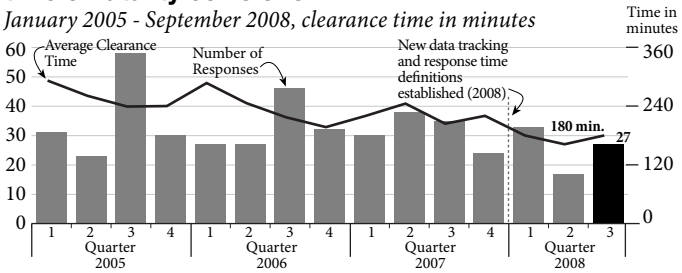
Data Source: WSDOT Washington Incident Response Tracking System

Incident Response Quarterly Update

The Nine Key Congested Corridors

Number of responses and average clearance time of fatality collisions

January 2005 - September 2008, clearance time in minutes



Data Source: Washington Incident Tracking System, WSDOT Traffic Office.

Note: In Q1 2008, WSDOT's Incident Response Program moved to a new database system and began calculating average clearance time in a different way. This accounts for the apparent decrease in the average clearance time value.

Annualized average duration of over-90-minute incidents on 9 key routes drops below new target during Quarter 3, 2008

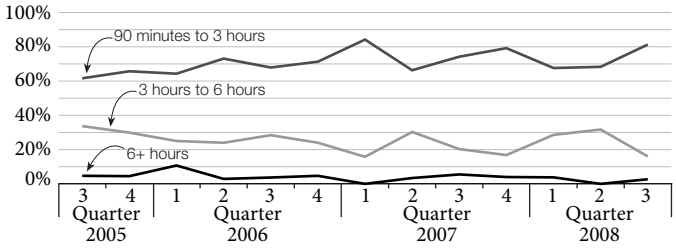
In Quarter 3 of 2008, the average duration of the 74 over-90-minute lane-blocking incidents was 147 minutes. This is a drop of 4% from last quarter, and a drop of 11.8% from the same quarter last year. The annualized average for the three quarters of 2008 to date is 154 minutes, just below the Governor's target of 155 minutes.

Two extraordinary incidents during Quarter 3, 2008

This quarter saw two extraordinary (6+ hour) incidents. These incidents exert a strong influence on the quarterly average so WSDOT and WSP generally highlight them to explain why they were so time-consuming. Both involved semi diesel leaks that resulted in investigations by the Department of Ecology. Without these incidents in the data set, the average duration for Quarter 3 of 2008 would have fall from 147 minutes to 139 minutes.

Duration of blocking incident by type and percentage

Quarter 3, 2005 - Quarter 3, 2008



Data Source: WSDOT Traffic Office and WSP.

Extraordinary (6+ Hour) incidents on the GMAP routes

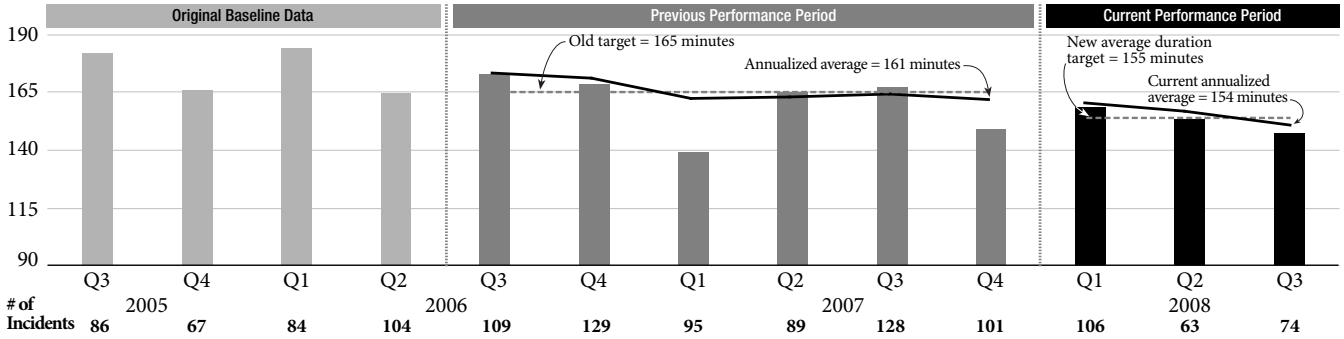
Quarter 3, 2008; Duration in minute

Date	Location	Duration	Brief Description
Aug 1	NB I-5, Tumwater	462 min.	Three-car injury collision. Fully loaded semi involved, spilled drywall across two lanes. DOE came to scene for 40 gallon diesel spill. Semi required two class C and one class S tow for removal.
Aug 20	NB I-5, 41st St.	403 min.	Semi went over embankment. DOE came to scene for 40-gallon diesel spill. Vehicle required class C tow.

Source: WSP and WSDOT Traffic Office

Progress towards GMAP goal or reducing average clearance time for over-90-minute incidents on the nine key highway segments

July 2005 - June 2008; Average duration in minutes



Data Source: Washington State Patrol and WSDOT Traffic Office.

The Nine Key Congested Corridors

Property damage collisions make up 26% of over-90-minute blocking incidents on the 9 key corridors

Since WSDOT and WSP began tracking over-90-minute blocking collisions on the 9 key routes, 325 (26.3%) of the 1235 total incidents have been incidents which involved non-injury, property-damage-only collisions.

In order to determine the contributing factors causing these incidents to last 90+ minutes, the agencies reviewed the 85 property damage collision incidents that occurred between September 2007 and August 2008; these make up 23.8% of the 357 incidents that occurred during that time period.

Commercial Motor Vehicle (CMV) Involvement – 55%

These collisions had a Commercial Motor Vehicle involved in the incidents. Often these incidents involved rollovers, damage to the trailer or cab, spilled loads, or diesel spills (see below). Often these vehicles required specialized tow trucks that were capable of up righting overturned trailers and hauling away these heavy vehicles. WSDOT and WSP began the Major Incident Tow program in July 2007 in order to expedite the clearance of these common blocking incidents.

Hazardous Material and Fuel Spills – 20%

In most instances, these events involved a CMV; either diesel fuel is leaking from the CMV's gas tanks, or liquids being hauled in the trailers were spilled in the course of a collision. When spills occur near waterways, responders take extra precautions in order to prevent or limit contamination. If the Department of Ecology is called to the scene, extra time is spent waiting for their arrival and review of the situation. Sometimes, contractors and special equipment are required to clean up the spill.

Pickup/SUV hauling trailers or other items – 13%

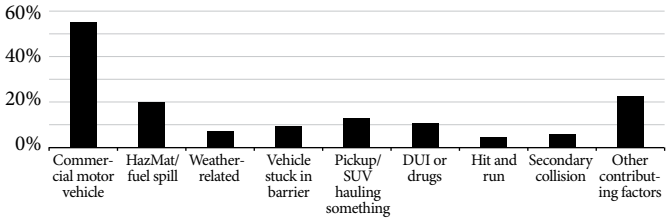
The events involved passenger vehicles that were hauling items lost them or became too damaged to continue hauling them. These items included U-Hauls, heavy equipment, trailers, campers, and boats. Removal of the often-damaged hauled item took special accommodations and therefore extra time. Almost all of these events took place between April and September.

Alcohol or Drugs – 11%

Property damage incidents involving alcohol or drug use required extra time for WSP to conduct investigations and make any necessary arrests.

Factors affecting over-90-minute property damage collisions on 9 key routes

September 2007 - August 2008



Out of 85 incidents from September 2007 - August 2008

Number will not add up to 100% because many incidents involve more than one variable

"Other" includes: DOT property damage; WSP trooper involved in collision; non-DUI/drug criminal activity; involved parties fleeing scene on foot; uninjured driver trapped in vehicle; leakage of non-hazardous cargo; and construction zone preventing timely arrival of responders.

Vehicle stuck in barrier – 9%

In these incidents, vehicles became wedged in guardrails, tangled in cable median barriers, or high-centered on jersey barriers, and required extra time for removal.

Weather-related – 7%

All of these events occurred between December and March. In some instances, snow and/or ice caused a property damage collision, and responders closed the roadway for de-icing as a safety precaution. Also, the weather sometimes hindered the response effort, making it difficult for responders to arrive at the scene or for damaged-but-drivable vehicles to leave it.

Secondary collision – 6%

Initial incident caused another (secondary) event or collision. This might be under-reported in the data because incidents are not coded for this. It is voluntary information offered by the WSP troopers.

Hit & Run – 5%

In these events, when a vehicle left the scene, the incident became a criminal investigation and this required extra time to secure the scene and investigate.

Other Contributing Factors – 22%

"Other" incidents included: DOT property damage, such as guardrail, cable median barrier, signs, and bridges, which must be fixed before reopening in order to protect public safety; a law-enforcement officer involved in the collision; criminal behavior by involved parties or outstanding warrants against them; involved parties fleeing the scene on foot; uninjured drivers trapped in vehicles and needing to be cut out; leaking cargo that is not hazardous; and barriers in the construction zone preventing responders from reaching the scene.

Rail: Quarterly Update

State-supported Amtrak *Cascades*

Washington State is one of 13 states to provide operating funds to Amtrak for intercity passenger rail service. Amtrak *Cascades* train operations span 466 miles of rail between Eugene, Oregon and Vancouver, BC. Amtrak uses five European-designed, Talgo trains for daily operations. Three are owned by Washington State, and the other two by Amtrak.

Amtrak *Cascades* service is jointly funded by Amtrak, and the states of Washington and Oregon. Amtrak provides operating funds for one daily round-trip route, Oregon provides for two routes, and Washington, through WSDOT, provides for four.

Amtrak *Cascades* third quarter ridership sets new record

State-supported Amtrak *Cascades* service demonstrated record growth in ridership during the quarter. There were 154,315 riders in the third quarter of 2008, an all-time high that represents a 21.9% increase over the same period in 2007. Overall Amtrak *Cascades* ridership increased 24.4%, at 226,607 for the quarter. Ridership during each month of the quarter represented all-time records for the service, and August 2008 ridership was the first month ever that Amtrak *Cascades* exceeded 80,000 riders.

Although high gasoline prices have helped contribute to some ridership growth, customer feedback also indicates that riders perceive the service to be a great value and appreciate the fact that they are avoiding traffic. They are also beginning to view the service as an environmentally responsible travel option.

Overall U.S. rail ridership rises

National Amtrak ridership in FY 2008 increased to 28.7 million, an 11.1% increase over the previous year, marking the sixth straight year of gains and setting a record for the most passengers using Amtrak trains since operations began in 1971. Total ticket revenue for the fiscal year reached $1.7 billion, a 14.2% increase over the $1.5 billion in FY 2007.

Among the trains on the Amtrak national network, the *Empire Builder* is again the most popular overnight train. With more than 554,000 passengers, the daily Chicago-St. Paul-Seattle/Portland train showed an increase of 9.8%. Stops in Washington state include Spokane, Wenatchee, Everett, and Vancouver, among others.

Rail Highlights

Ridership on state-supported Amtrak *Cascades* was 154,315 for the third quarter of 2008, a 21.9% increase over the same period in 2007.

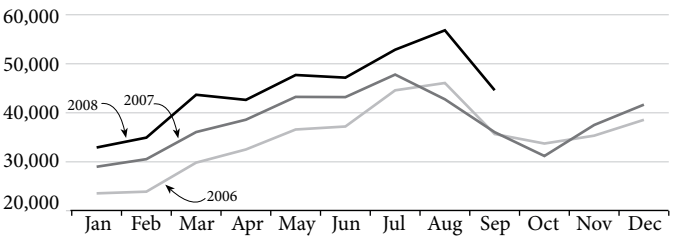
On-time performance declined slightly when compared to the third quarter of 2007, from 61.71% to 61.55% this quarter (on-time performance goal is 80%).

Revenue growth during May, June, and July of 2008 averaged 23.1% over those same months in the previous year.

Grain train carloads are down 41% compared to third quarter last year.

State-supported Amtrak *Cascades* monthly ridership

Number of passengers



Data Source: Amtrak and WSDOT State Rail and Marine Office.

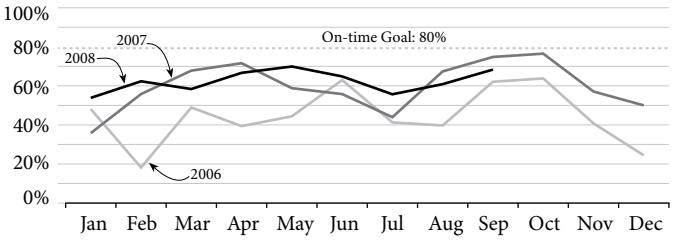
State-supported Amtrak *Cascades*

On-time performance

On-time performance for state-supported Amtrak *Cascades* trains was 61.55% for the quarter. This represents a slight decline of 0.16% when compared to the same period in 2007. In particular, August and September on-time performance was down approximately 6.5% from the same months last year.

State-supported Amtrak *Cascades* on-time performance

Percent on-time



Data Source: Amtrak and WSDOT State Rail and Marine Office.

Note: The on-time performance goal for Amtrak *Cascades* is 80% or better. A train is considered on-time if it arrives at its final destination within 10 minutes or less of the scheduled arrival time.

Substantial track improvements, including tie replacement and bridge work, were performed during the peak summer construction season. This construction contributed to slow track conditions in and around construction zones that hindered performance of Amtrak *Cascades* trains.

Amtrak *Cascades* ridership by funding entity

There are 11 daily Amtrak *Cascades* trains that connect major cities along the I-5 corridor. Washington, Oregon and Amtrak jointly fund their operation. The table below shows how many people are riding trains that are funded by each entity.

It is important to note that ridership during August and September 2007 was impacted by Talgo trains being out of service due to maintenance. Substitute equipment was made available for most but not all of the trains in the corridor during that time.

Amtrak *Cascades* ridership by funding entity

Funding Partner	3rd Quarter 2007	3rd Quarter 2008
State of Washington[1]	126,617	154,315
State of Oregon[2]	25,025	35,867
Amtrak[3]	30,530	36,425
Total Ridership	182,172	226,607

Data Source: Amtrak and WSDOT State Rail and Marine Office.

[1]Amtrak *Cascades* 501, 506, 507 (Seattle/Portland), 508, 510, 513, 516, and 517.

[2]Amtrak *Cascades* 500, 504, 507, and 509 between Portland and Eugene.

[3]Amtrak *Cascades* 500 and 509 between Seattle and Portland.

Thruway bus service enhances mobility options

In May, a new connecting bus service linking Bellingham, Mount Vernon, and Everett with Amtrak *Cascades* service was launched as a pilot project. The service enables riders traveling from as far away as Eugene, Oregon to get to these communities without excessive layovers, and provides a convenient, mid-day travel option. Transfers may also be made in Everett to Amtrak's *Empire Builder* bound for Spokane, Minneapolis/St. Paul, Milwaukee, and Chicago.

Ridership for the third quarter was 4,894, or an average of 53 riders a day. Just over half of the riders using the Thruway service are traveling between Seattle and Bellingham. In August, the farebox recovery for the service was 81%.

Stewardship

Amtrak *Cascades* monthly revenue

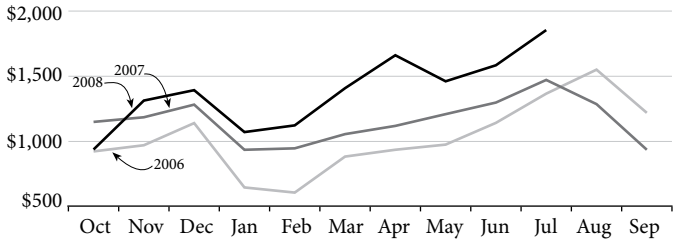
During the first ten months of Federal Fiscal Year (FFY) 2008 (October 2007-July 2008), total revenues for state-supported Amtrak *Cascades* trains were up 18.4% as compared to 2007. Revenue growth for May-July averaged 23.1% over the same months in 2007.

Revenue includes ticket receipts, income from on-board food and beverage sales, and proceeds from mail and express shipments on state-supported Amtrak *Cascades*. The data is generally received 60-90 days after a given month has passed due to the slower processing times for such receipts.

State-supported Amtrak *Cascades* revenue per month

FFY 2006 - FFY 2008 (Oct. 2007 - July 2008)

Dollars in thousands



Data Source: Amtrak and WSDOT State Rail and Marine Office.

Congress approves new rail legislation

On October 1, the U.S. Congress passed the Rail Safety Improvement Act of 2008, which will impact the delivery of Amtrak *Cascades* and intercity rail passenger service. It authorizes a

State-supported Amtrak *Cascades*/Washington State Grain Train

federal matching grant program (80% federal; 20% state) for intercity passenger rail development. The program is anticipated to provide $1.9 billion over five years, and the Amtrak *Cascades* program is well positioned to compete for these federal funds.

Rail projects aimed at reliability and capacity

Among the 40+ capital rail projects currently managed by the State Rail and Marine office, ten directly support Amtrak *Cascades*. When complete, these projects will reduce rail congestion, improve safety, upgrade track, improve reliability, and provide additional capacity.

Capital rail projects supporting Amtrak *Cascades* reliability and capacity are:

- Blaine Customs Facility Siding
- Everett Curve Realignments
- Kelso to Martin's Bluff
- King Street Station Track Improvements
- Mt. Vernon Siding Upgrade
- Point Defiance Bypass Project
- Stanwood New Station
- Stanwood Siding Upgrades
- Tenino High Speed Crossovers
- Vancouver Rail Project

For more information on WSDOT's capital rail projects, go to: www.wsdot.wa.gov/projects/rail. For project delivery information, please see page 80 of this *Gray Notebook*.

Amtrak *Cascades*.

Washington State Grain Train

The Washington State Grain Train is a financially self-sustaining, transportation program supporting the state's agricultural community while helping short-line railroads maintain a sufficient customer base for long-term financial viability.

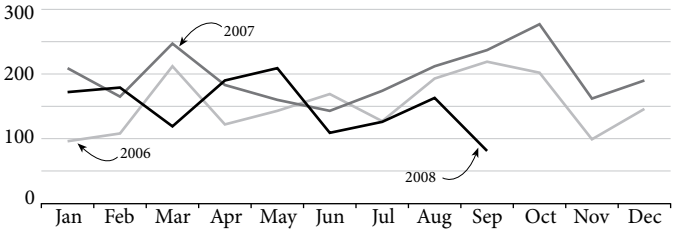
Grain train shipments decrease

Use of the WSDOT grain train cars was down over the third quarter of 2008. Total carloads for the third quarter of 2008 decreased 41% over the third quarter of 2007. There were 370 carloads shipped in the third quarter of 2008 compared with 623 in 2007.

This may be due in part to the price of wheat falling significantly over the past several months, causing many farmers to store their wheat rather than sell it.

Washington Grain Train carloads

Carloads per month for CY 2008 through Q3



Data Source: WSDOT State Rail and Marine Office.

Note: Cumulatively, there have been 1,348 carloads for CY 2008, compared to 1,389 in 2006 and 1,730 in 2007 through the third quarters.

National grain delivery is up

Nationally, railroad grain deliveries and carloads to ports are up for the year. However, weakening market conditions and hurricane-related impacts along the Gulf Coast have reduced shipments in every region but the Pacific Northwest (PNW). The United States Department of Agriculture (USDA) reports rail deliveries to PNW ports are up 39% from the same 4-week period a year ago and 27% above the 4-year average. More than half of all railroad deliveries to ports have been to PNW this year. Class I railroads have originated 19% more carloads of grain year-to-date above the same period in 2007. Ocean shipping rates from PNW to Japan are still lower than Gulf and East coast ports, but the gap is narrowing as the economy softens worldwide.

The USDA's weekly Grain Transportation Report can be accessed online at: http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=STELPRDC5072950&acct=graintransrpt.

Washington State Ferries Quarterly Update

Revenue & Ridership

Washington State Ferries highlights:

- Ridership was down 4.4% for the quarter.
- Farebox revenue was on-par with adjusted levels.
- The average number of complaints was 1.9 per 100,000 customers; a 60% reduction over the last fiscal quarter.
- The missed-trip reliability average improved to 1.1 annually per customer, a 50% improvement over the last fiscal quarter.
- On-time performance averaged 87%, a 4% improvement over the same sailing season last year.
- Both the vessel and terminal construction spending below biennial expectations by 8.4% and 9.9%, respectively.
- Emergency repairs are $0.2 million over biennial expectations.
- A total of 35 systems were replaced or refurbished as part of the WSF life-cycle preservation program. 38% of the expected 93 systems have been addressed so far this biennium.

Washington State Ferries (WSF) serves as both an extension of the state's highway system and as a regional mass-transit provider. It provides a critical link to communities separated by water or longer driving distances, and is essential to the movement of goods and people in the Puget Sound region. Currently, it is the largest operating auto-ferry fleet in the world, carrying over 10 million vehicles and 23 million passengers each year.

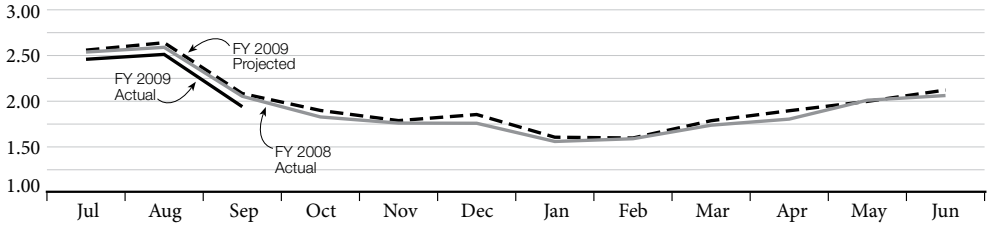
Stewardship

Ridership levels remain below expected levels

For the first fiscal quarter, 6.9 million persons traveled on the ferry system. For this quarter, WSF ridership was 4.4% below projected levels, or 318,561 fewer riders. Because WSF carries a large number of tourist passengers annually, the national decline in discretionary travel due to higher fuel prices has likely contributed to the reduction in ridership for the past few quarters. Projected ridership for fiscal year 2009 is 24.2 million riders, a reduction of 300,000 from last year's projection of 24.5 million.

WSF ridership by month

Actual ridership vs planned ridership for fiscal year 2009; numbers in millions



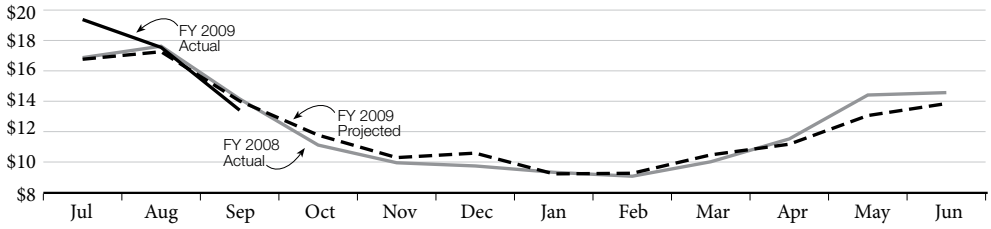
Data Source: WSDOT Ferry System.

Adjusted farebox revenue at forecasted levels

Farebox revenue was 4.8% above projected levels for the quarter, reversing the trend seen throughout fiscal year 2008. Farebox revenue was $50.3 million during the quarter, which is $2.3 million more than projected revenue of $48.0 million. Also, farebox revenue for the first quarter was $1.7 million more than the same quarter a year ago. WSF total farebox revenue for fiscal year 2009 is projected to be $147.7 million. The divergence between actual ridership and farebox revenue can be explained by an accounting prior-period adjustment in July. Not including the adjustment, revenues for the first quarter of FY 2009's would be $48,088,505. This is more in line with the planned revenue of $48,038,302, (0.1% higher than plan). The residual effects of the May 2007 fare increase account for the steady fare revenue in the face of reduced ridership.

WSF farebox revenues by month

Actual revenue vs planned revenue for fiscal year 2009; dollars in millions



Data Source: WSDOT Ferry System.

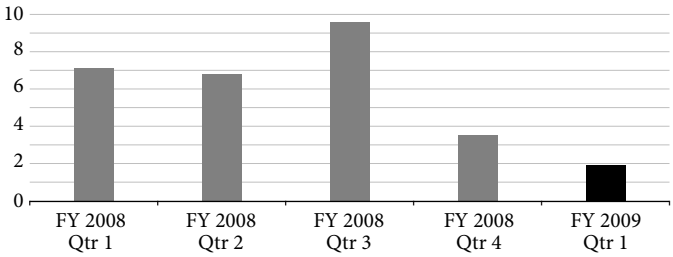
Washington State Ferries Quarterly Update

Customer Service

46% fewer complaints than last quarter

In the first fiscal quarter, WSF continued the trend of fewer complaints as reported in the fourth quarter of fiscal year 2008 (60% reduction over the fourth fiscal quarter). WSF had an average of 1.9 complaints per 100,000 customers during the first fiscal quarter. There were 132 complaints made during the quarter. This is a decrease of 46% over the previous quarter (3.5 complaints per 100,000 customers) and a 73% decrease from the same quarter one year ago (7.1 complaints per 100,000 customers).

Average number of complaints per 100,000 customers

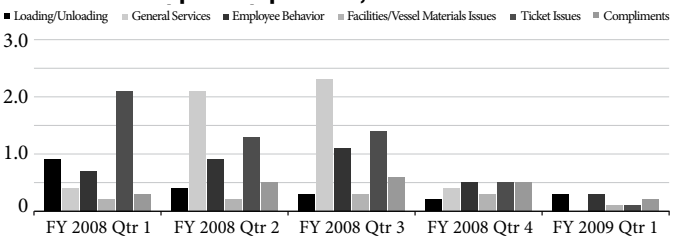


Data Source: WSDOT Ferry System.
Note: Beginning FY 2008 Quarter 4, WSDOT added four new complaint categories to its inventory that were not featured in previous quarters' calculations. They are 'Advertising', 'Vendors', 'Noise', and 'Reservations'.

The overall decrease in complaints was attributed to fewer customers complaining about 'general service' at WSF as well as ticketing issues, and employee behavior. There was a 50% reduction in complaints related to WSF's schedule this quarter a 37% reduction in complaints related to employee behavior, and a near 100% decline in 'general service' complaints.

During the previous fiscal quarter, WSF created four new specific complaint categories to track customer satisfaction: advertising, vendors, noise, and reservations. In the first fiscal quarter, WSF received only seven complaints total for these four new categories (5% of the total complaints received). Overall, WSF monitors individual customer complaints, comments, and compliments in order to evaluate its services within 30 categories. The department uses a quality ratio to measure the number of service complaints per 100,000 customers. This measure is used to make accurate performance comparisons over time and against other transportation service providers.

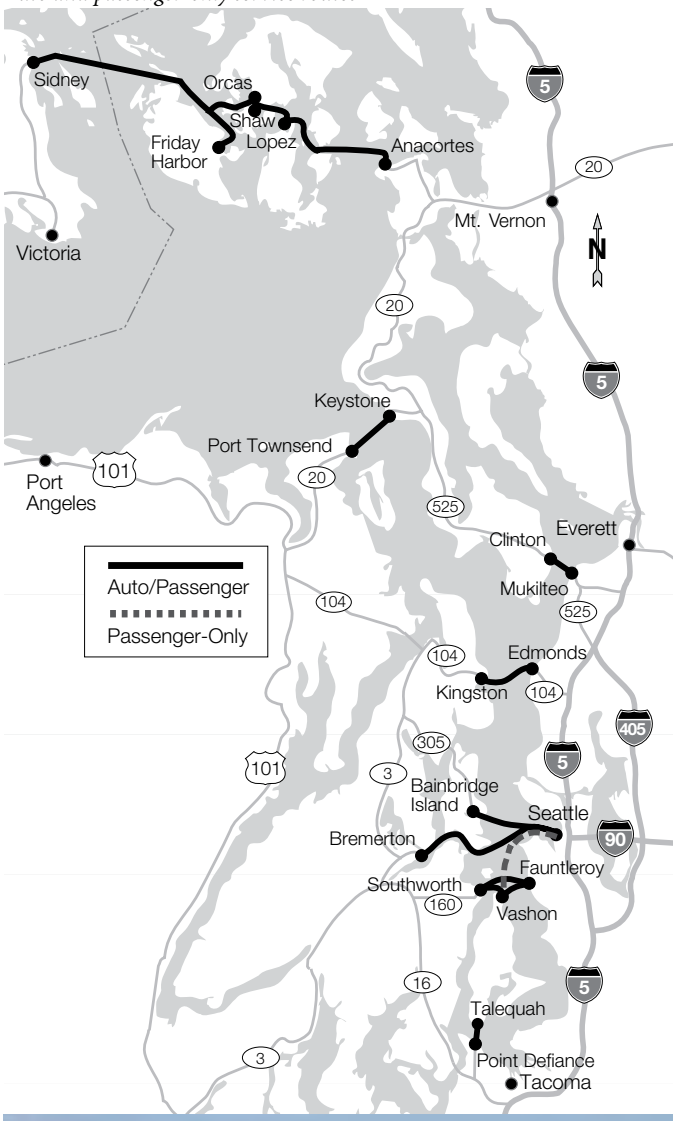
Common complaints per 100,000 customers



Data Source: WSDOT Ferry System.

Washington State Ferries Service Map

Auto and passenger-only service routes



Tribal canoes rest on the beach at Mukilteo with a ferry in the distance.

Service Reliability

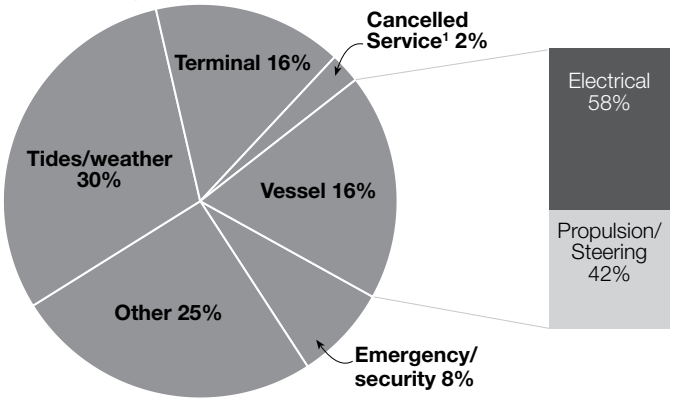
Mobility

Average number of missed trips reduced for second consecutive quarter

Trip reliability for the first fiscal quarter continued to improve dramatically with an annual average of 1.1 missed trips compared with the previous quarter, (2.2 missed trips/system-wide) a 50% decrease. WSF's missed trip index measures trip reliability averages, annualized based on quarterly data, and uses a transportation industry-based standard calculation to evaluate performance. Assuming 400 trips a year for each commuter. The improvement in missed trip reliability is an improvement upon the 60% reduction in the fourth fiscal quarter over the third fiscal quarter of 2008. In the first quarter of FY 2009, 42,845 sailing trips were scheduled. Of those, 163 were canceled and 41 were replaced, resulting in a total of 42,723 trips during the quarter (42,845 scheduled trips – 163 cancelled trips + 41 replacement trips = 42,723 net trips).

Nine of the 10 routes had an individual missed trip reliability average that was better than the system-wide average, and three routes had no missed trips this quarter (the Seattle-Bremerton route, the Seattle-Vashon Island passenger-only route, run on behalf of King County, and the Pt. Defiance-Tahlequah route). The operationally-challenging Port-Townsend-Keystone route concluded the quarter with a missed trip reliability average of 10.01, which was a 60% improvement in service reliability over the previous quarter. The Port Townsend – Keystone route encounters some of the strongest tidal conditions in Puget Sound in addition to challenging weather conditions (heavy fog and wind), which can sometimes overcome the operational abilities of the smaller *M/V Steilacoom II* ferry operating on this route.

Reasons for trip cancellations
First quarter, fiscal year 2009



Data Source: WSDOT Ferry System.
[1]Four trips were cancelled due to missed connections on the San Juan Islands (Domestic) route.

WSF missed-trip reliability comparison

	First quarter, fiscal year 2008			First quarter, fiscal year 2009		
Route	**Number of missed trips[1]**	**Missed trip index (average)[2]**	**Overall reliability average[3]**	**Number of missed trips[1]**	**Missed trip index (average)[2]**	**Overall reliability average[3]**
San Juan (Domestic)	15	0.77	99.80%	9	0.47	99.88%
Anacortes-Sidney, B.C. (International)	0	0.00	100.00%	1	1.11	99.73%
Edmonds - Kingston	8	0.69	99.83%	16	1.39	99.65%
Seattle - Vashon (Passenger Only)	0	0.00	100.00%	0	0.0	100.00%
Fauntleroy - Vashon - Southworth	28	1.04	99.74%	17	0.63	99.84%
Keystone - Port Townsend	264	46.15	89.66%	50	10.01	97.56%
Mukilteo - Clinton	5	0.29	99.92%	26	1.49	99.63%
Pt. Defiance - Tahlequah	14	1.80	99.55%	0	0.00	100.00%
Seattle - Bainbridge Island	10	0.96	99.76%	3	0.29	99.93%
Seattle - Bremerton	2	0.31	99.92%	0	0.0	100.00%
TOTAL	**346**	**3.22**	**99.20%**	**122**	**1.14**	**99.72%**

Data Source: WSDOT Ferry System.
[1]'Number of missed trips' is the difference (net) between the number of cancelled trips and the number of replaced trips.
[2] 'Missed trip index' is based on the number of missed trips per year for one commuter making 400 trips per year, including a departure and return trip on the same day, or 200 days per year. In previous editions of the *Gray Notebook*, this measure was referred to as the 'trip reliability index'.
[3]The overall reliability average is calculated by dividing the recorded number of net trips (scheduled trips - cancelled trips + make-up trips) divided by the number of scheduled trips.

Washington State Ferries Quarterly Update

Service Reliability

On-time performance declines 5% from last quarter

WSF's system-wide on-time performance rating declined 5% from the previous quarter. For the first fiscal quarter, WSF had an average of 87.2% of sailings recorded as sailing "on-time". Compared with the same quarter one year prior, on-time performance improved over the 83.3% recorded in the first quarter of fiscal year 2008.

The average sailing delay increased 23% compared to the previous quarter (4.8 minutes versus 3.9 minutes). However, as compared to a year ago, the average sailing delay decreased 16% during the quarter (5.7 minutes for the first quarter of FY 2008). The sailing delay is the duration between the 10 minute on-time "window" and when a vessel is detected as leaving its terminal.

WSF calculates its on-time performance rating using an automated tracking system on each of its terminals which records when a vessel leaves the dock. If a vessel is recorded as leaving the dock within 10 minutes of the scheduled departure time, then the trip is considered 'on-time'. WSF's on-time performance rating is calculated on the number of trips recorded by its automated tracking system; however, marine and atmospheric conditions may prevent all trips from being detected when a vessel leaves a terminal.

This quarter's system-wide on-time performance rating and average sailing delay does not include completed trips on the Port Townsend – Keystone route. Because WSF is using a leased vessel from Pierce County ferry system, the boat is without an automated tracking system that can report on-time departures.

How does WSDOT evaluate performance?

Several variables can affect the analysis of WSF quarterly performance measures in the *Gray Notebook*. For example, for some measures, WSDOT compares quarter-to-quarter to determine WSF performance, and for others, year-to-year performance.

Why different comparison standards?

When weather or sailing conditions might contribute to the performance of WSF, WSDOT will typically measure performance year-to-year. This way, a winter season is not compared to a summer season when there are a greater number of sailings but much less dramatic weather conditions. Where these conditions matter less, WSDOT will primarily compare quarter-to-quarter.

Thus, most service reliability measures (on-time performance, missed-trip index) are measured year to year. As a reference point, WSDOT will include the previous quarter's performance rating where it has historically been given.

For other measures, such as customer comments, WSDOT will perform quarter-to-quarter comparisons to evaluate trends over the course of a fiscal biennium.

WSF on-time performance comparison

	First quarter fiscal year 2008			First quarter fiscal year 2009		
Route	**Number of Actual Trips[1]**	**Percentage of Trips 'On-Time'**	**Average Delay from Scheduled Sailing Time**	**Number of Actual Trips[1]**	**Percentage of Trips 'On-Time'**	**Average Delay from Scheduled Sailing Time**
San Juan Islands (Domestic)	7,293	73%	8.2 minutes	7,280	80%	6.1 minutes
Anacortes-Sidney, B.C. (International)	359	65%	11.0 minutes	355	72%	8.4 minutes
Edmonds-Kingston	4,509	74%	7.2 minutes	4,511	77%	6.8 minutes
Seattle-Vashon (Passenger Only)	363	98%	3.0 minutes	332	98%	2.9 minutes
Fauntleroy-Vashon-Southworth	10,275	86%	4.9 minutes	10,573	92%	3.9 minutes
Keystone-Port Townsend	2,427	62%	10.8 minutes	N/A[2]	N/A[2]	N/A[2]
Mukilteo-Clinton	6,886	92%	3.9 minutes	6,656	91%	4.1 minutes
Pt. Defiance-Tahlequah	2,509	93%	4.1 minutes	2,850	87%	5.2 minutes
Seattle-Bainbridge Island	4,097	88%	3.8 minutes	4,110	88%	4.0 minutes
Seattle-Bremerton	2,532	96%	3.2 minutes	2,527	95%	3.7 minutes
TOTAL	**41,250**	**83%**	**5.7 minutes**	**39,194**	**87%**	**4.8 minutes**

Data Source: WSDOT Ferry System.

[1] Number of Actual Trips represents trips detected by the Automated Tracking System. It does not count all completed trips during the quarter, nor all trips counted are 'On-Time'.

[2] The Port Townsend - Keystone route is being serviced by a substitute vessel, the *M/V Steilacoom II*, which is not equipped with WSF's automated tracking system equipment, and can not report on-time performance for this route.

Construction and Preservation

Preservation

The WSF construction program for 2007-09 provides for capital investments throughout the ferry system. This program preserves and builds new ferry terminals and vessels; it is authorized to spend approximately $250 million.

Vessel construction biennium-to-date

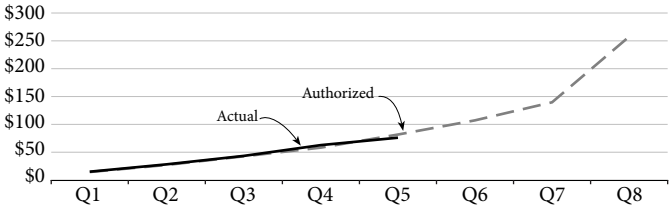
At the end of the first fiscal quarter, vessel construction expenditures were under-spending by $3.92 million, a 8.4% variance from the authorized funds ($46.76 million) for the quarter ending September 30, 2008. The major sources of the variance are under-spending on the new vessel construction, and preservation work on the M/V *Kaleetan* that is being deferred into the next biennium because of delays in the manufacture of new propulsion generators.

Terminal construction biennium-to-date

Terminal construction expenditures were under-spending by $2.54 million, a 9.9% variance from the authorized funds ($25.64 million) for the quarter ending September 30, 2008. The majority of the variance for the terminal construction program can be attributed to delay of the Port Townsend wingwall and tie-up pilings projects.

Construction program expenditures for Washington State Ferries

Through first quarter of fiscal year 2009, 2007-09 biennium
Authorized vs. actual, cumulative dollars in millions[1]



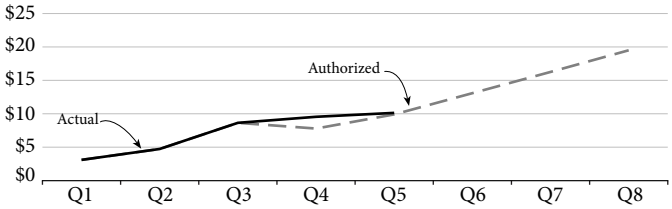
Data Source: WSDOT Ferry System.
[1]Authorized figures have been revised since the last reporting. See the March 31, 2008 edition of the *Gray Notebook* for more previous figures.

Emergency expenditures biennium-to-date

Emergency expenditures are over-spending $0.23 million to plan ($9.90 million for the biennium), for the quarter ending September 30, 2008.

Emergency expenditures for Washington State Ferries

Through first quarter of fiscal year 2009, 2007-09 biennium
Authorized vs. actual, cumulative dollars in millions[1]



Data Source: WSDOT Ferry System.
[1]Authorized expenditures have been revised since last reporting. See March 31, 2008 *Gray Notebook* for older figures.

Ferry vessel life-cycle preservation work

WSF uses a life-cycle preservation system that includes two system classifications (Category 1 and Category 2 systems). Each vessel has components that are classified as either being a Category 1 or Category 2 system. Category 1 systems are those components that are considered by regulatory agencies (such as the U.S. Coast Guard) as "vital" to the protection of people, the environment, and infrastructure. These include systems necessary to start, keep in motion, stop, land, and unload a vessel. The Category 2 systems are all other vessel components that are refurbished as part of a life-cycle preservation system.

For the 2007-2009 biennium, WSF planned on refurbishing or replacing 43 Category 1 systems and 50 Category 2 systems. So far this biennium, WSF has replaced 14 Category 1 components, including four fire-main pipping replacements during the first fiscal quarter. There have been 21 Category 2 systems replaced, which include one sewage piping replacement, two sewage structural preservations, a bilges structural preservation, assorted machinery spaces structural preservation, and a saltwater piping replacement, during the first fiscal quarter.

Vessel Preservation activities

First quarter of fiscal year 2009, 2007-09 biennium

System	Systems preserved[1]	Planned number of preservations[2]
Category 1 Systems	14	43
Category 2 Systems	21	50
Total	**35**	**93**

Data Source: WSDOT Ferry System.
[1] Cumulative to date.
[2] For the 2007-09 biennium

Washington State Ferries Quarterly Update

Highlights of Program Activities

Pierce County allows WSDOT Ferries Division to keep Steilacoom II for Port Townsend/Keystone route

On September 18, Pierce County and WSDOT agreed on a plan to ensure continuous ferry service for both the state's Port Townsend/Keystone route and the county's route from Steilacoom to Anderson and Ketron islands. Pierce County's ferry, the Steilacoom II, has been leased to WSDOT since February. The county will honor the lease through its expiration in August 2009, allowing the Steilacoom II to continue operating on the Port Townsend/Keystone route. The Christine Anderson, Pierce County's other ferry, will continue service from Steilacoom to Anderson and Ketron islands.

Pierce County's Steilacoom II sits at a terminal.

WSDOT Ferries Division continues biodiesel testing

WSDOT's Ferries Division began operating its third vessel, Klahowya, with a biodiesel fuel blend on July 19. The Klahowya is using a five percent blend (B5) of tallow-based biodiesel and ultra-low sulfur diesel. Its fueling is part of the Biodiesel Research and Demonstration Project, a scientific pilot test of biodiesel in the marine environment. The ferry system began the testing phase of the project in March with the fueling of the Issaquah using a five percent blend of soy-based biodiesel. In April, the Tillikum began running on a five percent blend of canola-based biodiesel. Biodiesel testing is expected to continue until February 2009. Results will be documented and will guide the marine industry in the use of biodiesel.

Environment

Statewide policy goal:

To enhance Washington's quality of life through transportation investments that promote energy conservation, enhance healthy communities, and protect the environment.

WSDOT's business goal:

To protect and restore the environment while improving and maintaining Washington's transportation system.

In this section

Annual Update: Air Quality 70

Annual Update: Noise Quality 72

Quarterly Update: ESA Documentation 75

See also

Quarterly Report on Capital Projects (Beige Pages) 78

Earlier Environment-related articles

Programmatic Permits, GNB 30

Fish Passage Projects, GNB 30

Environmental Documentation, GNB 29

Air Quality Annual Update

Federal Air Quality Standards

Air quality highlights and updates:

- The Puyallup River valley was declared to be in "non-attainment status" for surpassing the limit of 24-hour fine particulate matter with regards to air quality.
- Yakima, Vancouver/Clark county, and the central Puget Sound region could all be declared to be in non-attainment status if additional violations are recorded in 2008.
- Because federal transportation funds are tied to air quality compliance, WSDOT will assist where possible to facilitate $PM_{2.5}$ and 8-hour Ozone requirements.
- WSDOT has completed a $1.5 million exhaust-device retrofitting for its diesel-engine vehicles, which will remove 40-50% of particulate matter into the atmosphere.
- WSDOT's ferry system has established a goal of reducing fuel consumption by 8% over two years in order to reduce the amount of particulates put in the atmosphere.
- New bio-fuel testing is being conducted at WSDOT Ferry System to meet the statewide 20% bio-fuel mandate.

WSDOT's methods to improve transportation-related air quality are changing as scientists and health experts throughout the country look more deeply at the effects of toxic air pollutants, fine particulates, ground level ozone (smog), and greenhouse gas emissions.

Stricter EPA air quality standards lead to 'non-attainment' status

In March 2008, the U.S. Environmental Protection Agency (EPA) tightened its ambient air quality standards for ground-level ozone (commonly referred to as the '8-hour ozone') and 24-hour fine particulate matter ($PM_{2.5}$) standard for air quality, which tracks emissions from vehicles, machinery, and industries alike. Under the federal Clean Air Act, the EPA is required to designate localities in the U.S. that do not meet current ambient air quality standards as areas in "non-attainment" status. Prior to 2008, no areas in Washington state had been in non-attainment status for air quality since the early 1990s.

In 2008, unfortunately, four areas in Washington state were either found to be in non-attainment status, or are in jeopardy if additional violations occur before the end of 2008. Currently, only the Puyallup River valley/area (which includes Tacoma) has been found in non-attainment for violating $PM_{2.5}$ (and for standards enacted in 2006, not the stricter March 2008 standards). The Yakima-area and Vancouver/Clark county-areas could be found to be in non-attainment of the March 2008 $PM_{2.5}$ standards if additional air quality violations are recorded this winter. Finally, the central Puget Sound region is expected to be designated as non-attainment status for $PM_{2.5}$ in the next few years based on recent air quality measurements not meeting the stricter March 2008 standards.

What are WSDOT's obligations with the new non-attainment status for $PM_{2.5}$?

In December 2006, EPA reduced the allowable health-based standard for $PM_{2.5}$ from 65 micrograms per cubic meter ($\mu g/m^3$) to 35 $\mu g/m^3$. Based on violation of this standard, EPA has recommended a non-attainment area within the Puyallup River valley that encompasses much of the urban growth area concentrated in Tacoma.

WSDOT is limited in how it can respond to the non-attainment status for the Puyallup River valley because appropriate computer modeling tools for the quantitative "hot-spot" analysis of congested intersections, highways, and transit terminals (which generate a great deal of the 24-hour particulate) are unavailable for $PM_{2.5}$ analysis, and are not currently required. Instead, WSDOT must show qualitatively that projects in the Puyallup River valley conform to the current state air quality implementation plan. Qualitative hot-spot analyses involve more streamlined reviews of local factors, such as monitoring data from near road construction projects.

What are WSDOT's obligations with the new non-attainment status for ozone?

The EPA tightened the 8-hour ozone standard from 0.08 parts per million (ppm) to 0.075 ppm in March 2008. EPA's standard is calculated based on the three year average of the four highest daily maximums for a given area. The central Puget Sound region exceeded the EPA's new lower standard on August 15, 2008. Despite heavier than average summer rainfall (which typically lessens the impact of ground level ozone, this became the region's first violation of the arithmetic ozone standard since 1992). The August 2008 measured value of 0.076 ppm was combined with average values of 0.87 ppm in 2006 and 0.068 in 2007 to reach a three year average of 0.077 ppm.

Preventive Measures at WSDOT and Washington State Ferries

Federal transportation funds are affected by air quality status in areas where transportation-related emissions are a substantial contributor to the problem. After EPA makes its official designation, the region has three years to develop a plan to demonstrate that the region can meet national air quality standards in order to continue to secure federal transportation funding for non-safety only projects. WSDOT will be coordinating with clean air agencies, including the Puget Sound Clean Air Agency and the Department of Ecology, and the Governor's office. If a violation is determined for ozone in the Puget Sound region, Washington state has until May 2009 to propose a non-attainment area to the EPA, who then has a year to respond to the proposal. Although there is little WSDOT can do with regard to EPA's final designation, WSDOT is committed to appropriate emission control efforts in designing, constructing, and maintaining the state transportation system to help meet federal air quality standards.

Preventing pollution during construction

Reducing or preventing air pollution while building, repairing, and maintaining the transportation system is critical. WSDOT complies with existing air quality regulations through the active monitoring of fugitive dust at its construction sites. Fugitive dust is an air quality concern because of the health problems it poses to sensitive populations like the young, elderly, and those that suffer from respiratory problems like asthma. To control fugitive dust, WSDOT uses best management practices that include tasks such as spraying water over unpaved roads, reducing vehicle speeds, creating rock aprons at unpaved intersections, and reducing the amount of open earth, covering, and rock piles at active construction sites.

WSDOT has completed its retrofit of diesel engines in large vehicles in the Olympic and Northwest regions, using $1.5 million in grant funding from the Federal Congestion Mitigation and Air Quality (CMAQ) program. By installing a device on the exhaust systems of diesel truck engines, 40% to 50% of particulate matter from the exhaust is removed. Similar to the way that catalytic converters remove airborne toxins in smaller vehicles. A portion of the CMAQ grant is being used to convert the arrow sign boards (which use energy inefficient incandescent lights) that WSDOT operates in these regions to Light Emitting Diodes (LED) which use less energy and allow vehicle engines to shut down (idle reduction) without interfering with the use of the lights. This reduces fuel consumption and related emissions. CMAQ funding also provided for retrofitting WSDOT-operated diesel trucks in the Spokane area as well.

Reducing emissions at Washington State Ferries

Washington State Ferries (WSF) is actively working to the improve the air quality in Puget Sound by increasing the efficiency and reducing the emissions of its fleet of ferry vessels. WSF activities meet existing federal and international maritime air quality standards, and is evaluating additional measures to meet and/or exceed even more demanding air quality standards in the future.

Alternative fuel testing

WSF began evaluating alternative fuels in 2003 and after initial testing, adopted a system-wide conversion to low sulfur diesel in 2004. Low-sulfur fuels, though more expensive, emit fewer diesel particles into the atmosphere when burned. In one year, WSF reduced its contribution of these particles by 75 tons (a 30% reduction compared with 'regular' marine diesel fuel). Additional reductions in particulate matter have been reached by using ultra-low sulfur diesel, which provides an additional 10% reduction in emission levels. Finally, WSF is in the demonstration phrase of its second study of bio-diesel fuels on select vessels to evaluate their effectiveness in maritime environments. New state requirements state that bio-fuels must be used in 20% of all state vehicles and vessels by 2009. WSF hopes that the use of bio-diesel on the ferries will help the department meet these new requirements.

Fuel conservation initiative

In addition to evaluating the use of cleaner burning fuels, WSF is looking for ways to reduce fuel consumption overall. This initiative has set a goal to reduce fuel consumption levels by 8% through implementation of specific measures, measured from April 2007 baseline conditions. WSF began by measuring how and when its vessels consume fuel during operations in order to develop baseline vessel and route profiles for evaluating reduction strategies. Some of the measures that will contribute to the 8% reductions include:

- Reconfiguring propulsion systems to run on fewer engines,
- Carrying less fuel aboard vessels to reduce weight,
- Reusing waste heat generated by engines to heat passenger cabins instead of steam boilers, and
- Reducing the use of propulsion engines to hold the ferries at dock during loading and unloading.

Noise Quality Annual Update

Noise Regulations and Noise Barriers

Noise from roadway traffic is unavoidable as long as tires touch the road, people modify exhaust pipes on vehicles, compression brakes don't have mufflers, and heavy trucks move against the wind at high speed.

Federal noise obligations

Since 1977, federal noise rules require that states evaluate noise when they expand or change the roadway in a way that will affect the noise environment and when an expansion or realignment project is already located in a high noise area. WSDOT follows a three-step question-and-answer process to develop a noise study that complies with federal regulations.

- Does noise approach or exceed the federal impact criteria in the future build-scneario? For Washington state, the level for sensitive locations like homes and parks is 66dB(A) or more decibels (A-weighted for human hearing or "dB(A)") This is the equivalent of a loud conversation outside between two individuals.
- The 'Feasibility' qualification: If traffic noise occurs at 66 dB(A) and above, is noise protection that will effectively reduce noise physically possible to build?
- The 'Reasonableness' qualification: If noise protection is effective, do the mitigating effects meet federally required cost/benefit criteria?

Expanding WSDOT's noise reduction options

Sometimes traditional noise protection methods like earth berms, which are high mounds of soil that block or reduce freeway noise to help shield neighborhoods, or conventional walls will not provide adequate benefits or the costs are extremely high compared to the benefits for the locations. They may be ineffective because of steep hills, unstable slopes, lack of space, bridges over water, and more. WSDOT is actively working to find alternatives that may reduce noise more effectively and at lower cost by:

- Exploring the effectiveness of alternative paving materials and practices like air pockets in more flexible asphalt, methods of grinding existing concrete, and special texturing of new concrete;
- Searching for lower cost, visually pleasing, and lighter weight noise barriers that will hold up to graffiti and graffiti removal, vehicle crashes, fire, and other roadway hazards for 50 or more years. It's important to find solutions that will work on bridges without overloading them.

The number of noise barriers is growing with the roadway system

WSDOT built approximately five new miles of noise barrier between 2007 and 2008, for a total of 84.6 miles of barriers since 1963. Some of that mileage includes locations where WSDOT retrofitted noise barrier along I-5 in the Greenlake, Licton Springs, Eastlake, and Portage Bay neighborhoods of Seattle. These neighborhoods adjacent to I-5 were targeted as part of WSDOT's program to improve the noise levels near highways in an organized and equitable way. The location and construction of I-5 in the 1950s and 1960s through some Washington state neighborhoods occurred prior to the current studies of highway noise impacts. Additional retrofits are also planned for the next biennium along I-5 for Westview School in Burlington and in Lacey from 2009 to 2011. These retrofits are made possible through targeted funding from the Legislature and qualify as top priority retrofits due to community age, density, and the high level of noise that they experience. There remain about 60 other prioritized, but unfunded locations statewide at this time.

For more information about traffic noise visit WSDOT's Acoustics website at: http://www.wsdot.wa.gov/Environment/Air/default.htm.

Noise Quality highlights

WSDOT constructed five miles of new noise wall barrier since the last report in 2007.

New noise barriers were installed in three Seattle neighborhoods identified as benefiting from their installation.

Statewide, there are 84.6 miles of permanent noise barriers along state highways.

WSDOT now has two quiet pavement test sections in Washington state: I-5 southbound near Lynnwood and SR 520 near Medina.

Early testing of quiet pavements on I-5 and SR 520 reveal different noise qualities and levels for the test pavement types compared with conventional hot mix asphalt.

For both conventional and test pavement types, recorded noise levels are lower in the warmer summer months, and higher in the cooler fall and winter months.

Quieter Pavement Testing & Research

Since more than 70% of roadway noise comes from tires on pavement when vehicles travel at high speeds, WSDOT is measuring tire/pavement noise on various pavement types to see what noise levels they produce. Of the 13 locations with alternate pavement-types, three are specifically designed as quieter pavement test sections (I-5 Lynnwood in 2006, SR 520 Medina in 2007, and the upcoming installation on I-405 through Bellevue in 2009).

The 10 other locations represent a variety of pavement types, traffic volumes, studded tire percentages, and rainfall/snow patterns that are of interest to WSDOT for their potential noise and pavement wear characteristics. These 10 locations were not designed specifically to reduce noise.

In the already constructed quieter pavement test sections (I-5 and SR 520), WSDOT is comparing three different pavement types: first, the two pavements designed to be quieter have air pockets and different asphalt glue (rubberized and polymer) holding the gravel together. These two pavement types are being compared with the third control section, which is made up of standard dense asphalt containing fewer air pockets.

Initial results indicate different noise qualities

On all test sections the noise levels from the two test pavements are indistinguishable when compared to the standard control pavement by the human ear in terms of overall noise levels, though the frequency distribution or quality of sound differs between the pavements.

However, the polymer test pavement has overtaken the rubber test pavement as the quietest of the test pavements in all south-bound lanes of the I-5 Lynnwood test section after two years of tire wear, and also in two of the five lanes of SR 520 after one year of tire wear. Even the conventional HMA has lower overall noise levels than the test rubber; at least in some measurements for the heavily traveled outside lane.

Temperature can play a role in tire/pavement noise. With warmer temperatures in summer, the tire pavement noise levels have decreased a bit, though not to the levels that WSDOT measured when the pavement was new. WSDOT expects some noise to increase again during the winter.

WSDOT will continue to evaluate these pavement sections throughout the life of the pavement, likely for the next eight to 10 or more years.

Case study initial findings

Lynnwood open graded asphalt on I-5 (southbound only)

Since its installation in the summer of 2006, WSDOT has observed varying noise results based on different rates of wear on the four travel lanes for the two different quiet pavement types. Outside lanes have heavier truck volumes and more vehicles with studded tires than the (inside) HOV lane. These traffic differences may account for some of the differences in the noise levels. The table on the following page shows highest and lowest recorded noise levels for different lanes and pavement types to date. All of the tire/pavement noise levels through the I-5 Lynnwood test section are slowly increasing compared with the period when the test pavement was first installed in 2006. This is not a surprise since testing across the country has shown that all pavements tend to get louder as the initial smoother surface wears away.

Medina vicinity test section on SR 520

This test section in the Medina vicinity was installed in July 2007. Since installation, WSDOT has observed a general decline of noise reduction benefits in all five traveled lanes (two general purpose eastbound and westbound and one westbound HOV lane). Traffic volumes on this section of SR 520 are lower than the I-5 Lynnwood test section and have about half of the heavy trucks in the total vehicle mix (approximately 5% on SR520 and 10% on I-5 in Lynnwood).

The table on the following page shows the highest and lowest recorded noise levels for different lanes and pavement types to date. At this point, the noise levels from the three pavements under evaluation are indistinguishable by the human ear in terms of overall noise level, though the frequency distribution or "quality" of sound still differs a bit between the pavements. Like the I-5 Lynnwood test section, all of the tire/pavement noise levels throughout this test section are slowly increasing compared with the period when the test pavement was first installed in 2007. On the SR 520 test section, the rubberized sections began as the quieter of the two test materials on all five measured lanes. However, after one year, the polymer sections were the quieter material on two of the five measured lanes.

For more information about WSDOT's quieter pavement test program and month-by-month tracking of the results, visit the quieter pavement website at: http://www.wsdot.wa.gov/Projects/QuieterPavement/

Noise Quality Annual Update

Sound intensity levels directly from tires on Lynnwood open graded asphalt on I-5 test section

Test section constructed in 2006, measurements recorded 2006-2008

Road segment (Pavement type)	Quietest sound level recorded (decibels)	Recorded on	Loudest sound level recorded (decibels)	Recorded on
Outside general purpose lane				
Conventional HMA[1]	97.7	9/28/2006	104.0	5/6/2008
Test Rubber[2]	94.3	9/7/2006	103.9	5/6/2008
Test Polymer[3]	96.3	9/28/2006	101.5	5/6/2008
Middle general purpose lane				
Conventional HMA[1]	99.1	9/28/2006	104.5	5/6/2008
Test Rubber[2]	95.0	8/23/2006	104.4	5/6/2008
Test Polymer[3]	95.8	9/7/2006	102.9	7/2/2008
Inside general purpose lane				
Conventional HMA[1]	99.0	8/23/2006	103.7	5/6/2008
Test Rubber[2]	94.6	9/7/2006	103.2	5/6/2008
Test Polymer[3]	96.1	9/7/2006	100.0	4/4/2008
Inside HOV lane ◊				
Conventional HMA[1]	98.8	9/7/2006	102.7	4/4/2008
Test Rubber[2]	95.2	12/4/2006	101.7	5/6/2008
Test Polymer[3]	95.7	9/7/2006	100.5	5/6/2008

Sound intensity levels directly from tires on Medina vicinity test section on SR 520

Test section constructed in 2007, measurements recorded 2007-2008

Eastbound outside general purpose lane				
Conventional HMA[1]	99.2	8/9/2007	102.1	4/4/2008
Test Rubber[2]	96.3	8/9/2007	101.0	4/4/2008
Test Polymer[3]	97.6	7/25/2007	101.6	7/9/2008
Eastbound inside general purpose lane				
Conventional HMA[1]	99.1	8/9/2007	102.0	5/6/2008
Test Rubber[2]	97.0	8/9/2007	100.6	5/6/2008
Test Polymer[3]	96.7	7/25/2007	99.4	4/4/2008
Westbound outside HOV lane ◊				
Conventional HMA[1]	100.5	8/9/2007	102.8	4/4/2008
Test Rubber[2]	95.0	7/25/2007	99.4	4/4/2008
Test Polymer[3]	96.9	7/25/2007	99.8	5/6/2008
Westbound Outside general purpose lane				
Conventional HMA[1]	100.0	8/9/2007	102.6	4/4/2008
Test Rubber[2]	97.0	7/25/2007	100.1	4/4/2008
Test Polymer[3]	99.5	7/25/2007	101.6	1/17/2008
Westbound Inside general purpose lane				
Conventional HMA[1]	100.1	8/9/2007	103.2	4/4/2008
Test Rubber[2]	95.1	7/25/2007	101.2	5/6/2208
Test Polymer[3]	98.2	7/25/2007	100.8	4/4/2008

Data Source: WSDOT Environmental Services.

[1] HMA: Hot Mix Asphalt, the standard paving material for most highways. For more information on HMA usage at WSDOT, please see page 129 of the *Gray Notebook*.

[2] Rubber is short for "open graded friction course asphalt rubber", which can also be understood as asphalt pavement with additional air pockets and recycled tire rubber added to the liquid asphalt.

[3] Polymer is short for "open graded friction course Styene Butadiene Styrene", which can be understood as asphalt pavement with addition air pockets and synthetic rubber and fibers added to the liquid asphalt.

Endangered Species Act Documentation Quarterly Update

The Endangered Species Act (ESA) requires that all projects with federal funds or permits be evaluated for effects and potential impacts the project may have on listed endangered and threatened species. Projects that will result in impacts to listed species undergo consultation either informally or formally with the Services: US Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration/National Marine Fisheries Service (NOAA Fisheries). WSDOT projects with no effect on ESA listed species do not undergo consultation with the Services.

Nickel projects with ESA components

There are 20 planned Nickel construction projects in the 2007-09 biennium. Nineteen of these projects have completed an ESA review and one will be completed by the end of the biennium. For the 2009-11 biennium, there are thirteen projects planned. Three projects have completed ESA reviews; two projects, ***I-5/NE 134th St Interchange (Salmon Creek Interchange)*** and ***I-5/ Port of Tacoma Rd to King County Line HOV***, are undergoing consultation; and seven will complete an ESA review in the near future. As reported in the June 30, 2008 *Gray Notebook*, one project still does not have enough information at this time to determine consultation need.

TPA projects with ESA components

Of the 103 TPA-funded projects in the 2007-09 biennium, 88 have completed an ESA review or consultation. Eight projects in this group are currently in either formal or informal consultation. The remaining TPA-funded projects in the 2007-09 biennium include five internal ESA reviews and two projects that do not have enough information to determine consultation need at this time. Sixty-two TPA projects are planned for the 2009-11 biennium. Three of these projects are undergoing formal consultation at the Services (***SR 14/Camas Washougal Lanes and Interchange***, ***I-5/Portland Ave and SR167 Interchanges*** and ***SR 500/St John's Blvd Interchange***). Eighteen have completed ESA review or consultation and 39 will be completed in the future. Two projects do not have sufficient information to determine their consultation needs.

PEF projects with ESA components

There are 251 PEF projects funded for the 2007-09 biennium. Of these, 215 have completed an ESA review or consultation. Twenty-five projects will complete an ESA review or consultation by the end of the (calendar) year. One project is undergoing informal consultation with the Services. The remaining 10 projects in the 2007-09 biennium do not have sufficient information to determine consultation need at this time. For the 2009-11 biennium, only nine of the 83 PEF projects have completed ESA review. Nearly all of the remaining projects (59) are scheduled for ESA review or consultation in 2009. One project is under formal consultation at this time (***SR 303/Manette Bridge Bremerton Vicinity***). Fourteen projects need additional information to determine consultation need.

Endangered Species Act updates:

2007-09 Nickel projects: zero new projects under review with the Services, no additional ESA reviews were completed.

2009-11 Nickel projects: one more project completed ESA review, and one more is currently under review with the Services.

2007-09 TPA projects: there are seven more projects under review at the Services, and 18 more projects have completed ESA reviews.

2009-11 TPA projects: there are two fewer projects under review with the Services, but four more have completed ESA reviews.

2007-09 PEF projects: there is one project now under review with the Services, and 35 more have completed ESA reviews.

2009-11 PEF projects: three additional projects have completed ESA review.

A birds-eye view of the SR 14/ Camas - Washougal project. Lady Island is the feature on the lower left, with the Camas Slough running between the island and the city of Camas.

Endangered Species Act Documentation Quarterly Update

Endangered Species Act compliances for all projects

Project Status	2007-09 Nickel Projects	2009-11 Nickel Projects	2007-09 TPA Projects	2009-11 TPA Projects	2007-09 PEF Projects	2009-11 PEF Projects
Projects under review at the Services	0	2	8	3	1	1
ESA Review or Biological Assessment Underway	1	7	5	39	25	59
Projects which lack sufficient information to start the Biological Assessment[1]	0	1	2	2	10	14
ESA Review Complete[2]	19	3	88	18	215	9
Total # of Projects	**20**	**13**	**103**	**62**	**251**	**83**

Data Source: WSDOT Environmental Services.

[1]This means that WSDOT does not yet have enough information regarding design to begin an ESA review.

[2]Projects that have completed an ESA review include those requiring consultation (formal or informal) with the services and those that did not require consultation (no effect reviews or programmatic BAs).

Federal Proposal to Change Endangered Species Act

On August 15, 2008, the Services announced a proposed a rule amendment regulating governing interagency cooperation under the federal ESA of 1973, as amended. The Services proposed changes to the ESA that would clarify several definitions, redefine when consultation is necessary, clarify thresholds for effects analysis, and to establish time frames for the informal consultation process. One of the proposed changes would exclude projects where the effects would be inconsequential, uncertain, unlikely or completely beneficial from consultation requirements. This proposed change would allow the Services to focus energy on projects that have a likelihood of impacting a species population rather than spending time on projects that have a low probability of impact. In effect, the changes could result in a reduction of WSDOT projects requiring consultation by as much as 80 percent. The proposed rule change will undergo the necessary public review process where it is likely to face strong challenges when the Services begin soliciting comments.

Stewardship

Statewide policy goal:

To continuously improve the quality, effectiveness, and efficiency of the transportation system.

WSDOT's business goal:

To enhance WSDOT's management and accountability processes and systems to support making the right decisions, delivering the right projects, and operating the system efficiently and effectively in order to achieve the greatest benefit from the resources entrusted to us by the public.

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Worker Safety 2

WSDOT's Capital Project Delivery Programs

Highway Construction: Nickel and TPA Project Delivery Performance Overview

Project Delivery Highlights for Nickel and TPA combined:

- Both Nickel and TPA programs are 100% on or under their total legislative baseline of $1.804 billion to date.
- 89% of Nickel and TPA projects combined are early or on-time, holding steady from last quarter's results.
- 87% of Nickel and TPA projects combined are under or on-budget, an improvement of 1% from last quarter.
- 77% of Nickel and TPA projects combined were both on-time and on-budget, the same percentage as last quarter.

WSDOT has successfully delivered 167 Nickel and TPA projects on target with the $1.804 billion Legislative budget

Since 2003, WSDOT has delivered a total of 167 Nickel and Transportation Partnership Account (TPA) projects for $1.804 billion, on target with the legislative budget expectation.

WSDOT delivers 17 projects during the first quarter of FY 2009

WSDOT's capital program delivery performance held steady at 77% in delivering projects on-time and on-budget through the first quarter of FY 2009, as another four Nickel projects and 13 TPA projects were completed.

On-time and on-budget performance on individual projects remains steady

For the 167 highway projects completed through September 30, 2008, changes from the previous quarter are:

- On-time delivery performance held steady at 89%;
- On-budget performance improved slightly to 87%; and
- On-time and on-budget project delivery performance improved slightly to 78%.

61 Nickel and TPA projects under construction or advertised for construction

This quarter, five new projects were advertised for construction. One project was advertised earlier than scheduled and the rest were on time. One project is pending contract award amount, but the remaining projects have been awarded for a cumulative construction contract total of $12.9 million.

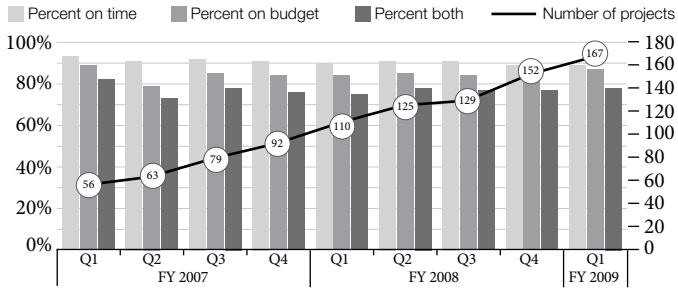
43 projects totaling an estimated $1.39 billion at completion are scheduled to advertise by March 31, 2009

Nine significantly sized projects have budgets of $20 million, while another seven have budgets between $10 and $20 million. All but seven are on their original schedule, and six have been advanced to advertise earlier.

Original project information in Schedule, Scope & Budget tables

The beige pages report the agency's project delivery performance against the most recent Legislative baseline (currently the 2008 supplemental budget). The *Gray Notebook* will also include the amount originally appropriated in the 2003 Nickel and 2005 TPA funding packages. Original appropriation figures for this edition includes Nickel and TPA projects completed through September 30, 2008.

Cumulative performance of Nickel and TPA Projects



Data Source: WSDOT Project Control and Reporting.

In future editions of the *Gray Notebooks*, WSDOT will include project scope as compared to the scope included in the original budget. The *Gray Notebook* reports "on scope" as compared to last legislative expectations. This new reporting will complement the inclusion of projects' original budget, which are included in this edition.

New: Completed project wrap ups

For more comprehensive information about projects completed in this quarter, turn to pages 103-109, for the new project wrap up section. These wrap up articles will build upon the principles of accountability and performance journalism and provide a better sense of the challenges WSDOT faces in delivering projects, WSDOT's work to use tax dollars as efficiently as possible, and the benefits citizens can expect to see from completed projects.

Highway Construction Performance Dashboard

Each quarter, WSDOT provides a detailed update on the delivery of the highway capital programs in the *Gray Notebook* and on the web (at www.wsdot.wa.gov) through the Project Pages and Quarterly Project Reports. The *Gray Notebook*'s Beige Pages generally do not include planning studies or projects that do not have a construction phase. PEF projects are budgeted by program for the improvement and preservation of the highway system, and the delivery of the work is reported programmatically in six categories.

Each of the 153 Nickel and 238 TPA projects has a line item budget, and are reported at an individual project level. Budgets for PEF, Nickel, and TPA in this edition of the *Gray Notebook* are based on the 2008 Supplemental Budget.

Highway construction performance dashboard	Nickel (2003)	Transportation Partnership Account	Combined Nickel & TPA	Pre-Existing Funds
Total number of projects	153	238	391	758
Total program budget*	$3,946,466	$9,415,872	$13,362,338	$4,411,627
Schedule, Scope, and Budget Summary: Results of completed projects				
Cumulative to date: 2003 – September 30, 2008	For Nickel and TPA details, see pages 81-86			See pages 99-102
Total number of projects completed	**104**	**63**	**167**	
% Completed early or on-time	88%	90%	89%	
% Completed within scope	100%	100%	100%	
% Completed under or on-budget	90%	82%	87%	
% Completed on-time and on-budget	82%	73%	78%	
Baseline estimated total cost at completion	$1,618,846	$190,561	$1,809,407	
Current estimated cost at completion	**$1,617,725**	**$186,666**	**$1,804,391**	
% of total program over or under budget	0.1% under	2.0% under	0.3% under	
Biennium to date: 2007-09				
Total number of projects completed	**35**	**40**	**75**	**232**
% Completed early or on-time	83%	90%	87%	-
% Completed within scope	100%	100%	100%	-
% Completed under or on-budget	89%	87%	88%	-
% Completed on-time and on-budget	77%	77%	77%	-
Baseline estimated cost at completion	$864,943	$175,642	$1,040,585	$1,403,904
Current estimated cost at completion	**$864,386**	**$171,951**	**$1,036,337**	**$1,412,194**
Advertisement Record: Results of projects entering into the construction phase or under construction				
Cumulative to date: 2003 – September 30, 2008	For Nickel and TPA details, see pages 87-90			See page 101
Total number of projects in construction phase	**18**	**43**	**61**	**N/A**
% Advertised early or on-time	83%	93%	90%	–
Total award amounts to date	$562,412	$628,925	$1,191,337	–
Biennium to date: 2007-09	For Nickel and TPA details, see pages 87-90			See page 101
Total advertised	11	31	42	136
% Advertised early or on-time	91%	97%	95%	94%
Total award amounts to date	$265,457	$240,541	$505,998	N/A
Advertisement schedule for projects in the pipeline: Results of projects now being advertised for construction or planned to be advertised				
October 1, 2008 through March 31, 2009	For Nickel and TPA details, see pages 91-93			See pages 98-102
Total projects being advertised for construction bids	6	37	43	86
% On schedule or early	100%	81%	84%	-

Data Source: WSDOT Project Control & Reporting. * per 2005-07 Transportation Budget, Section 603.

WSDOT's Capital Project Delivery Programs

Rail and Ferries Performance Dashboard

A total of six Nickel projects and three Transportation Partnership Account (TPA) rail construction projects have been delivered on time and on budget as of September 30, 2008 (100% on-time, 100% on-budget) for $30,415 million. Five projects (three Nickel-funded, two TPA-funded) in construction have total award amounts of $29,837. Three rail projects were advertised prior to September 30, 2008.

To date, ferries has not completed any construction projects using Nickel or TPA funding, but three projects (two Nickel-funded and one TPA-funded) are in construction.

Rail performance dashboard
As of September 30, 2008; dollars in thousands

	Nickel (2003)	Transportation Partnership Account	Combined Nickel & TPA
Schedule, scope and budget summary: completed projects			
Cumulative to date, 2003 – September 30, 2008	6	3	9
% Completed early or on time	100%	100%	100%
% Completed within scope	100%	100%	100%
% Completed under or on budget	100%	100%	100%
% Completed on time and on budget	100%	100%	100%
Baseline estimated cost at completion	$23,090	$7,965	$31,055
Current estimated cost at completion	$23,090	$7,965	$31,055
% of total program on or under budget	100%	100%	100%
Advertisement record: projects under construction or entering construction phase			
Biennium to date, 2007-09			
Total advertised	3	2	5
% Advertised early or on time	100%	100%	100%
Total award amounts to date	$23,301	$6,536	$29,837
Advertisement schedule: projects now being advertised or planned to advertise			
April 1, 2008 through September 30, 2008			
Total being advertised for construction	1	2	3
% On schedule or earlier	33%	67%	50%

Ferries performance dashboard
As of September 30, 2008; dollars in thousands

	Nickel (2003)	Transportation Partnership Account	Combined Nickel & TPA
Advertisement record: projects under construction or entering construction phase			
Cumulative to date, 2003 – September 30, 2008			
Total number of projects in construction phase	2	1	3
% Advertised early or on time	25%	100%	40%
Total award amounts to date	$10,712	$49,196	$59,908
Advertisement schedule: projects now being advertised or planned to advertise			
April 1, 2008 through September 30, 2008			
Total being advertised for construction	0	0	0
% On or better than schedule	N/A	N/A	N/A

Data Source: WSDOT Project Control and Reporting Office.

Schedule, Scope and Budget Summary

167 Highway projects completed as of September 30, 2008

Nickel and Transportation Partnership Account (TPA) projects, costs estimated at completion, dollars in thousands

Project Description	Fund type	On-time advertised	On time completed	Within scope	Baseline estimated cost	Current estimated cost	On budget	Completed on time, on budget
Cumulative to date								
2003-05 Biennium Summary See *Gray Notebook* for quarter ending Sept 30, 2006, for project listing. May be accessed at http://www.wsdot.wa.gov/Accountability/GrayNotebook/gnb_archives.htm.	19 Nickel	4 early 15 on time	6 early 13 on time	19	$118,575	$118,450	9 under 8 on budget 2 over	17 on time and on budget
2005-07 Biennium Summary See *Gray Notebook* for quarter end June 30, 2007, for project listing. May be accessed at http://www.wsdot.wa.gov/Accountability/GrayNotebook/gnb_archives.htm.	50 Nickel 23 TPA	20 early 48 on time 5 late	49 early 16 on time 8 late	73	$650,986	$652,896	27 under 33 on budget 13 over	53 on time and on budget

Project Description	Fund type	Original appro-priation & *year*	On time adver-tised	On time completed	Within scope	Baseline estimated cost	Current estimated cost	On budget	Completed on time, on budget
Biennium to date (2007-09)									
Adams, Franklin Co – Roadside safety improvements (Adams, Franklin) Advertisement date was delayed to complete cultural resource survey and environmental permits. The operationally complete date was delayed until spring due to the time required for contractor to purchase and receive steel components for the guardrail system.	TPA	$1,000 *2005*	Late	Late	√	$1,000	$999	√	
US 2/Dryden – Install signal (Chelan)	Nickel	$320 *2003*	√	√	√	$498	$498	√	√
SR 502/10th Ave to 72nd Ave – Safety improvements (Clark) * Project scope reduced to low-cost operational enhancements after TPA program funded a widening project in the same corridor.	TPA	$1,215 *2005*	Early	√	√ *	$736	$749	√	√
SR 503/Gabriel Rd intersection (Clark) * Presence of potential hazardous waste site raised construction costs to a point exceeding the projected benefits of building the right turn lane. Project scope reduced to low-cost operational enhancements during the 2007 legislative session.	TPA	$773 *2005*	√	Early	√ *	$501	$501	√	√
I-5/Lexington vicinity – Construct new bridge (Cowlitz)	Nickel	$5,000 *2003*	√	√	√	$5,000	$5,000	√	√
SR 260, 263, and 278 – Upgrade guardrail (Franklin, Spokane, Whitman) Advertisement date was delayed to complete cultural resource survey and environmental permits. The operationally complete date was delayed until spring due to the time required for contractor to purchase and receive steel components for the guardrail system.	Nickel	$1,025 *2005*	Late	Late	√	$1,054	$1,054	√	
US 12/Waitsburg to SR 127 – Roadside safety improvements (Garfield, Columbia, Walla Walla)	TPA	$166 *2005*	√	Early	√	$266	$116	Under	√
US 12/SR 127 to Clarkston – Roadside safety improvements (Garfield, Columbia)	TPA	$1,900 *2005*	√	Early	√	$307	$153	Under	√

WSDOT's Capital Project Delivery Programs

Schedule, Scope and Budget Summary

167 Highway projects completed as of September 30, 2008

Nickel and Transportation Partnership Account (TPA) projects, costs estimated at completion, dollars in thousands

Project Description	Fund type	Original appro-priation & *year*	On time adver-tised	On time completed	Within scope	Baseline estimated cost	Current estimated cost	On budget	Completed on time, on budget
SR 17/Pioneer Way to Stratford Rd – Widen to four lanes (Grant)	TPA	$15,215 *2005*	√	Early	√	$20,989	$20,985	√	√
US 12/Clemons Rd vicinity – Intersec-tion improvements (Grays Harbor)	TPA	$2,500 *2005*	√	Early	√	$1,455	$1,159	Under	√
US 12/Wynoochee River Bridge – Upgrade bridge rail (Grays Harbor)	Nickel	$43 *2005*	Late	√	√	$257	$202	Under	√
Delay was to tie with another project for efficiency.									
US 101/Quinault River Bridge – Upgrade bridge rail (Grays Harbor)	Nickel	$51 *2005*	Late	√	√	$268	$229	Under	√
Advertisement date changed to balance with Nickel Bridge Rail retrofit allocation.									
SR 105/Johns River Bridge – Upgrade bridge rail (Grays Harbor)	Nickel	$68 *2005*	Late	√	√	$338	$263	Under	√
Advertisement date changed to balance with Nickel Bridge Rail retrofit allocation.									
US 101/Mt Walker – Add passing lane (Jefferson)	TPA	$2,500 *2005*	Late	√	√	$3,550	$2,397	Under	√
Advertisement was delayed for possible redesign of structural elements. Redesign was deemed unnecessary and the project was advertised in 4/07.									
SR 116/SR 19 to Indian Island – Upgrade bridge rail (Jefferson)	Nickel	$154 *2005*	Late	Late	√	$475	$570	Over	
Advertisment delay due to Dept of Archaeology & Historic Preservation (DAHP) review required for this project.									
I-5/Pierce County line to Tukwila inter-change – Add HOV lanes (King)	Nickel	$55,100 *2003*	Early	Late	√	$142,593	$139,857	√	
The delay in operationally complete date from May 2007 to July 2007 was due to poor weather that reduced the number of workable contract days.									
I-5/S Seattle Northbound Viaduct – Bridge paving (King)	TPA	$11,389 *2005*	√	Early	√	$14,360	$16,072	Over	
Project was over budget due to increased quantities for polyester concrete, project security, and additional contractor incentive payment.									
I-5/Southbound Viaduct, S Seattle vicinity – Bridge repair (King)	TPA	$3,910 *2005*	√	Early	√	$1,108	$1,266	Over	
Project was over budget due to increased traffic control and additional contractor incentive payment.									
I-90/Eastbound Ramps to SR 18 – Add signal and turn lanes (King)	Nickel	$3,354 *2003*	√	Early	√	$5,012	$5,012	√	√
I-90/Eastbound Ramps to SR 202 – Construct roundabout (King)	Nickel	$932 *2003*	√	√	√	$1,832	$1,843	√	√
SR 99/Alaska Way Viaduct, Yesler Way vicinity – Stabilize foundation (King)	TPA	$4,472 *2008*	√	√	√	$4,637	$4,637	√	√
SR 99/S 284th to S 272nd St – Add HOV lanes (King)	Nickel	$13,304 *2003*	√	√	√	$15,404	$15,153	√	√
SR 167/15th St SW to 15th St NW – Add HOV lanes (King)	Nickel	$39,600 *2003*	√	Early	√	$41,491	$42,437	√	√

Operational completion was expected in December 2007, based on an accelerated schedule submitted by the contractor. The contractor was unable to complete the paving operations in 2007 due to bad weather in November and December; further, harsh winter weather damaged remaining ramps, which required roadway and paving repairs. In addition, electrical work meshed more efficiently with the adjacent HOT lane project. WSDOT asked OFM for funds to cover the higher costs.

Schedule, Scope and Budget Summary

167 Highway projects completed as of September 30, 2008

Nickel and Transportation Partnership Account (TPA) projects, costs estimated at completion, dollars in thousands

Project Description	Fund type	Original appro-priation & *year*	On time adver-tised	On time completed	Within scope	Baseline estimated cost	Current estimated cost	On budget	Completed on time, on budget
SR 167 HOT Lanes Pilot Project – Managed lanes (King)	TPA	$13,780 *2005*	Early	Early	√	$17,877	$18,876	Over	
The project is operationally complete but over budget due to higher than expected construction costs for sign bridges, retaining walls and environmental work. Traffic control costs were higher than initially estimated: contractor used night lane closures during summer 2008 in order to meet construction schedule.									
SR 169/SE 291st St vicinity (formerly SE 288th Street) – Add turn lanes (King)	TPA	$1,600 *2005*	√	√	√	$2,606	$2,669	√	√
I-405/SR 520 to SR 522 – Widening (King)	Nickel	$163,735 *2003*	√	√	√	$87,293	$81,505	Under	√
SR 516/208th and 209th Ave SE – Add turn lanes (King)	Nickel	$1,443 *2003*	Late	Late	√	$1,881	$2,398	Over	
Delays by the utility company in turn delayed construction into late fall; heavy rains delayed the schedule further and added labor and equipment costs.									
SR 522/I-5 to I-405 – Multimodal improvements (King)	TPA	$9,681 *2003*	Early	Early	√	$22,581	$22,487	√	√
SR 3/SR 303 Interchange (Waaga Way) – Construct ramp (Kitsap)	Nickel	$15,179 *2003*	√	√	√	$24,828	$26,191	Over	
Increase was due to change orders to cover overruns in erosion control, traffic control, and slope maintenance.									
SR 3/Imperial Way to Sunnyslope – Add lanes (Kitsap)	TPA	$2,544 *2005*	Late	Early	√	$2,911	$1,547	Under	√
Delay was due to unresolved utilities issues.									
SR 7/Lewis Co – Roadside safety improvements (Lewis)	TPA	$1,700 *2005*	√	Early	√	$1,680	$871	Under	√
SR 401/US 101 to E of Megler Rest Area vicinity – Upgrade guardrail (Pacific)	Nickel	$130 *2005*	Early	Early	√	$296	$152	Under	√
I-5/S 48th to Pacific Ave – Add HOV lanes (Pierce)	Nickel	$92,987 *2003*	√	√	√	$105,546	$105,546	√	√
Pierce, Thurston Co – Roadside safety improvements (Pierce, Thurston)	TPA	$1,000 *2005*	√	Early	√	$1,000	$936	Under	√
SR 7/SR 507 to SR 512 – Safety improvements (Pierce)	Nickel	$11,429 *2003*	√	Late	√	$20,268	$21,150	√	
The operationally complete date was delayed due to additional time needed for signal system installation, which delayed paving and sidewalk work.									
SR 20/Ducken Rd to Rosario Rd – Add turn lanes (Skagit, Island)	Nickel	$4,393 *2003*	Late	√	√	$8,505	$8,519	√	√
Advertisment date was delayed due to environmental permitting issues.									
SR 20/Thompson Road – Add signal (Skagit)	TPA	$775 *2005*	Early	√	√	$1,038	$1,038	√	√
SR 99/N of Lincoln Way – Construct sidewalks (Snohomish)	TPA	$931 *2005*	√	√	√	$1,557	$1,557	√	√
US 2/Fern Bluff to Sultan Startup – Stormwater drainage improvements (Snohomish)	TPA	$799 *2005*	√	Early	√	$1,012	$465	Under	√

WSDOT's Capital Project Delivery Programs

Schedule, Scope and Budget Summary

167 Highway projects completed as of September 30, 2008

Nickel and Transportation Partnership Account (TPA) projects, costs estimated at completion, dollars in thousands

Project Description	Fund type	Original appro-priation & *year*	On time adver-tised	On time completed	Within scope	Baseline estimated cost	Current estimated cost	On budget	Completed on time, on budget
US 2/10th St Intersection vicinity – Stormwater drainage improvements (Snohomish)	TPA	$441 *2005*	√	√	√	$534	$212	Under	√
US 2/Pickle Farm Road and Gunn Road – Add turn lanes (Snohomish)	Nickel	$973 *2003*	Late	√	√	$1,322	$1,346	√	√
Advertisement delayed to address design deviations and late addition of consultant staff.									
I-5/SR 526 to Marine View Drive – Add HOV lanes (Snohomish)	Nickel	$246,286 *2003*	Early	√	√	$220,575	$221,427	√	√
I-5/41st St Interchange – Widening and rebuild ramps (Snohomish)	TPA	$40,400 *2005*	Early	√	√	$42,844	$42,844	√	√
SR 531/Lakewood Schools – Construct sidewalks (Snohomish)	TPA	$460 *2005*	Early	√	√	$705	$495	Under	√
SR 9/SR 522 to 228th St SE, Stages 1a and 1b – Add lanes (Snohomish)	Nickel	$22,250 *2003*	√	√	√	$22,840	$24,472	Over	
Project was over budget due to higher than anticipated costs associated with erosion control and water removal. Work on the project was suspended in December 2007 and moved to February 2008 to avoid adverse impacts to wetlands adjacent to the project site during winter weather.									
SR 9/228th St SE to 212th St SE (SR 524), Stage 2 – Add lanes (Snohomish)	Nickel	$22,283 *2003*	√	√	√	$31,181	$31,319	√	√
SR 9/108th Street NE (Lauck Road) – Add turn lanes (Snohomish)	Nickel	$1,353 *2003*	√	√	√	$1,846	$1,828	√	√
Whitman, S Spokane Co – Roadside safety improvements (Spokane, Whitman)	TPA	$1,000 *2005*	Late	Late	√	$1,000	$991	√	
Advertisment date was delayed to complete cultural resource survey and environmental permits. The operationally complete date was delayed until spring due to the time required for contractor to purchase and receive steel components of the guardrail system.									
I-90/Latah Creek and Lindeke St Bridges – Upgrade bridge rail (Spokane)	Nickel	$737 *2005*	√	Early	√	$813	$810	√	√
I-90/Harvard Rd Pedestrian Bridge – Construct bridge (Spokane)	TPA	$332 *2005*	√	√	√	$1,333	$1,371	√	√
SR 25/Spokane River Bridge – Upgrade bridge rail (Stevens, Lincoln)	Nickel	$354 *2005*	√	√	√	$369	$313	Under	√
SR 25/Columbia River Bridge – Upgrade bridge rail (Stevens)	Nickel	$448 *2005*	√	√	√	$468	$465	√	√
SR 4/Svensen's Curve (Wahkiakum)	Nickel	$6,714 *2003*	√	√	√	$1,637	$1,637	√	√
Real estate and construction costs escalated to a point exceeding the projected benefits of straightening the curve. Project scope reduced to low-cost operational enhancements during the 2007 legislative session.									
US 12/Attalia vicinity – Add lanes (Walla Walla)	Nickel	$10,333 *2003*	√	Early	√	$16,201	$16,207	√	√
SR 543/I-5 to Canadian border – Add lanes (Whatcom)	Nickel	$33,897 *2003*	Late	Early	√	$49,013	$50,807	√	√
Advertisement date was delayed due to delays in acquiring right of way.									

Schedule, Scope and Budget Summary

167 Highway projects completed as of September 30, 2008

Nickel and Transportation Partnership Account (TPA) projects, costs estimated at completion, dollars in thousands

Project Description	Fund type	Original appro-priation & *year*	On time adver-tised	On time completed	Within scope	Baseline estimated cost	Current estimated cost	On budget	Completed on time, on budget
SR 270/Pullman to Idaho state line – Add lanes (Whitman)	Nickel	$30,619 *2003*	Late	√	√	$31,188	$31,188	√	√
Advertisement was delayed due to environmental permitting issues and Corps of Engineers mitigation negotiations. The project was completed within budget; however, WSDOT is currently negotiating with the contractor on a significant contractor claim.									
SR 241/Rattlesnake Hills vicinity – Roadside safety (Yakima, Benton)	TPA	$1,100 *2005*	Late	Early	√	$2,170	$1,868	Under	√
Advertisment date delayed due to environmental permitting issues.									
SR 823/Goodlander to Harrison Rd – Build sidewalk (Yakima)	TPA	$376 *2005*	√	Early	√	$993	$1,169	Over	
Cost increases due to design changes for utility relocation and right of way easements, as well as material cost escalation and inflation. Cost increases are covered by Pre- Existing Funds.									
Current quarter									
SR 14/Benton Co – Roadside safety improvements (Benton)	TPA	$800 *2005*	√	Early	√	$1,691	$1,691	√	√
SR 24/SR 241 to Cold Creek Rd – Add passing lanes (Benton, Yakima)	TPA	$3,800 *2005*	√	Early	√	$5,145	$5,145	√	√
W Olympic Peninsula – Roadway safety improvements (Clallam, Grays Harbor, Jefferson)	TPA	$2,000 *2005*	√	√	√	$2,000	$1,231	Under	√
SR 14/Lieser Rd Interchange – Add ramp signal (Clark)	TPA	$1,000 *2005*	Early	Early	√	$973	$830	Under	√
SR 500/I-205 Interchange – Extend merge lane (Clark)	TPA	$975 *2005*	Early	Early	√	$1,002	$690	Under	√
SR 432 – Roadside safety improve-ments (Cowlitz)	TPA	$600 *2005*	Early	Early	√	$616	$471	Under	√
SR 410 and SR 164 – Roadside safety improvements (King)	TPA	$1,200 *2005*	√	Early	√	$1,200	$1,188	√	√
SR 202/Jct SR 203 – Construct round-about (King)	Nickel	$2,803 *2003*	√	Late	√	$3,950	$3,950	√	
Operationally complete date was delayed due to severe winter weather conditions that led to complete shut-down of construction.									
SR 515/SE 182nd St to SE 176th St vicinity – Construct traffic island (King)	TPA	$900 *2005*	Late	√	√	$1,701	$1,657	√	√
US 97/Klickitat Co – Roadside safety improvements (Klickitat)	TPA	$1,000 *2005*	√	Early	√	$1,000	$1,000	√	√
US 2 and SR 92 – Roadside safety improvements (Snohomish)	TPA	$1,200 *2005*	√	Late	√	$1,232	$1,222	√	
Operationally complete date was delayed due to winter shut-down of construction as a result of weather restrictions and materials availability.									
SR 9/Schloman Rd to 256th St NE – New alignment (Snohomish)	Nickel	$15,952 *2003*	Late	Early	√	$16,137	$16,651	√	√
SR 9/252nd St NE vicinity – Add turn lane (Snohomish)	Nickel	$881 *2003*	Late	Early	√	$1,731	$1,554	Under	√

WSDOT's Capital Project Delivery Programs

Schedule, Scope and Budget Summary

167 Highway projects completed as of September 30, 2008

Nickel and Transportation Partnership Account (TPA) projects, costs estimated at completion, dollars in thousands

Project Description	Fund type	Original appro-priation & *year*	On time adver-tised	On time completed	Within scope	Baseline estimated cost	Current estimated cost	On budget	Completed on time, on budget
SR 9/268th St Intersection – Add turn lane (Snohomish)	Nickel	$2,765 *2003*	Late	Early	√	$2,833	$2,833	√	√
SR 902/Medical Lake Interchange – Intersection improvements (Spokane)	TPA	$600 *2005*	Late	√	√	$743	$817	Over	
The project is completed one month earlier than the scheduled operational complete date. The current estimated cost to complete this project includes $73K received in developer funds. When these additional funds are added to the current legislatively approved budget, the project is actually completed within budget.									
SR 542/Boulder Creek Bridge – Replace bridge (Whatcom)	TPA	$6,025 *2005*	Late	Late	√	$7,258	$7,247	√	
Advertisement date delayed due to time required to analyze alternative bridge footings, which delayed environmental review and permitting process. Operationally complete date delayed when demolition of the old bridge missed the 2007 fish passage window and was rescheduled to 2008: final embankments for the new bridge could not be constructed with old bridge still in place.									
SR 410/Rattlesnake Creek – Stabilize slopes (Yakima)	TPA	$250 *2005*	√	Early	√	$331	$332	√	√

	Percent on time advertised	Percent on time completed	Percent within scope	Current Legislative expectaion baseline	Current estimated cost at completion	Percent of budgets on time	Percent on time, on budget
Totals current quarter (September 30, 2008)	**65%**	**82%**	**100%**	**$49,543**	**$48,509**	**94%**	**76%**
4 Nickel projects	25%	75%	100%	$24,651	$24,988	100%	75%
13 TPA projects	77%	85%	100%	$24,892	$23,521	92%	77%
Totals biennium to date (2007-09)	**72%**	**87%**	**100%**	**$1,040,585**	**$1,036,337**	**88%**	**77%**
35 Nickel projects	63%	83%	100%	$864,943	$864,386	89%	77%
40 TPA projects	80%	90%	100%	$175,642	$171,951	87%	77%
Totals cumulative to date**	**84%**	**89%**	**100%**	**$1,809,407**	**$1,804,391**	**87%**	**78%**
104 Nickel projects	85%	88%	100%	$1,618,846	$1,617,725	90%	82%
63 TPA projects	84%	90%	100%	$190,561	$186,666	83%	73%

Source: WSDOT Project Control and Reporting Office

Definitions

On-Time Advertised
The project was advertised within the quarter as planned based on the original Legislative expectation (2003-05 Nickel, 2005-07 TPA).

On-Time Completed
The project was operationally complete within the quarter as planned in the original Legislative expectation (2003-05 Nickel, 2005-07 TPA). "Operationally complete" is the date when the public has free and unobstructed use of the facility. In some cases, the facility will be open, but minor work items may remain to be completed.

Within Scope
The project was completed within the specific functional intent of a project as last approved by the Legislature.

On-Budget
The project was within +/- 5% of the current Legislative expectation (baseline).

**Note: As established by the 2005 Legislative Evaluation and Accountability Program (LEAP) committee. However, dollars shown are for all fund types, not just Nickel or Transportation Partnership Account funds.

Advertisement Record

61 Projects in construction phase as of September 30, 2008

Nickel and Transportation Partnership Account (TPA) projects, dollars in thousands

Project description	Fund type	On time advertised	Ad date	Contractor	Operationally complete date	Award amount
Cumulative to date						
SR 112/Hoko and Pysht Rivers – Erosion control (Clallam)	TPA	Early	Aug-06	State Forces	Mar-09	$200
This project is now closed after a lengthy evaluation subsequent to State Forces repair work completed in December 2006 that corrected the deficiencies at the time.						
I-5/SR 502 Interchange – Build interchange (Clark)	Nickel	√	Dec-06	Kerr Contractors, Inc.	Jun-09	$28,394
I-90/Two Way Transit – Transit and HOV, Stage 1 (King)	TPA	Late	Oct-06	Max. J. Kuney Co.	Oct-08	$28,532
Agreement of Access with Mercer Island delayed the advertisement to 10/16/06.						
SR 509/I-5 to Sea-Tac – Freight and congestion relief (King)	TPA	Late	Jun-06	Tri-State Construction, Inc.	Sep-09	$344
The original advertisement date is November 2005, though project funding was uncertain until Initiative I-912 was decided in November 2005, requiring an update of the ad date. The original schedule update to the project list was not entered in the 2006 Legislative Budget, though the ad date was updated to June 2006 in the 2007 Legislative Budget.						
SR 509/SR 518 Interchange – Signalization and channelization (King)	TPA	Early	Apr-07	Tri-State Construction, Inc.	May-09	$26,631
SR 518/SeaTac Airport to I-5 – Eastbound widening (King)	TPA	√	*Combined with the project above for construction efficiencies.*			
I-405/NE 10th St – Bridge crossing (King)	TPA	Early	Sep-06		Dec-09	
• I-405/NE 10th St Bridge crossing	TPA		Sep-06	City of Bellevue	Apr-08	$9,772
• I-405/NE 10th St Bridge crossing Stage 2	TPA		Sep-07	Max J. Kuney Company	Dec-09	$13,866
I-405/I-90 to SE 8th St – Widening (King)	Nickel	Early	Oct-06	Guy F. Atkinson Construction LLC	Dec-09	$124,000
I-405/112th Ave SE to I-90 – Northbound widening (King)	TPA	Early	*Combined with the project above for construction efficiencies.*			
SR 167/S 180th St to I-405 – Southbound widening (King)	TPA	Early	Feb-07	Bilfinger/Tri-State Joint Venture	Jun-10	$91,500
I-405/SR 181 to SR 167 – Widening (King)	TPA	Early	*Combined with the project above for construction efficiencies.*			
• I-405/I-5 to SR 169 Stage 1 – Widening (King)	TPA		Feb-07	Bilfinger/Tri-State Joint Venture	Jun-10	
• I-405/Springbrook Creek – wetland and habitat mitigation bank (King)	TPA		Aug-06	Scarsella Bros., Inc.	May-09	$12,539
I-405/I-5 to SR 181 – Widening (King)	TPA	Early	*Combined with the project above for construction efficiencies.*			
SR 520/W Lake Sammamish Parkway to SR 202, Stage 3 – Widening (King)	Nickel	Late	Jan-07	Tri-State Construction, INC.	Sep-11	$9,988
The advertisement for the flyover ramp portion of this project has been delayed to January 2007 due to stormwater and wetland design changes. The flyover ramp is currently open to traffic and the widening portion of the project is scheduled for advertisement in October 2008.						
SR 104/Hood Canal Bridge – Replace east half bridge (Kitsap, Jefferson)	TPA	√	Feb-03	Kiewit-General, A Joint Venture	Jun-09	$204,000
I-5/Rush Rd to 13th St – Add lanes (Lewis)	Nickel	√	Mar-07	Scarsella Bros., Inc.	Dec-09	$33,750
US 101/Lynch Road – Safety improvements (Mason)	TPA		Dec-05	Mason County	Mar-10	$1,000

WSDOT's Capital Project Delivery Programs

Advertisement Record

61 Projects in construction phase as of September 30, 2008

Nickel and Transportation Partnership Account (TPA) projects, dollars in thousands

Project description	Fund type	On time advertised	Ad date	Contractor	Operationally complete date	Award amount
SR 20/Fredonia to I-5 – Add lanes (Skagit)	Nickel	√	Nov-06	Scarsella Bros., Inc.	Oct-09	$15,139
SR 20/Quiet Cove Rd vicinity to SR 20 Spur – Widening (Skagit)	Nickel	√	May-07	Marshbank Construction, Inc.	Oct-09	$6,129
US 395/NSC-Francis Ave to Farwell Rd – New alignment (Spokane) The advertisement delay on this project was due to delays in the right-of-way acquisition.	Nickel	Late	Jan-04		Aug-09	
• NSC-Farwell Rd – Road lowering (Spokane)	Nickel		Jan-04	Max J. Kuney Company	Jul-05	$4,976
• NSC-Gerlach to Wandermere – Grading – Construction (Spokane)	Nickel		Nov-04	KLB Construction Inc.	Sep-06	$9,987
• NSC-Francis Avenue to US 2 Structures – REBID (Spokane)	Nickel		May-06	Max J. Kuney Company	Jul-08	$17,236
• US 395/NSC-Freya to Fairview vicinity – Grading and structures (Spokane)	Nickel		Jan-07	Steelman-Duff	Nov-08	$10,571
• US 395/NSC-Freya St to Farwell Rd – PCCP paving (Spokane)	Nickel		Feb-07	Acme Concrete Paving	Mar-09	$19,490
• US 395/NSC – BNSF RR tunnel (Spokane)	Nickel		Sep-07	Scarsella Bros. Inc.	Aug-09	$17,295
Biennium to date (2007-09)						
SR 17/Othello vicinity to Soap Lake vicinity – Install lighting (Adams, Grant) Advertisement date was advanced to construct a portion of this project as a part of a larger PEF program for construction efficiencies.	TPA	Early	Dec-07	Central Washington Asphalt	Oct-09	
SR 26/Othello vicinity – Install lighting (Adams, Grant) Advertisement date was advanced to construct a portion of this project as a part of a larger PEF program for construction efficiencies.	TPA	Early	Dec-07	Central Washington Asphalt	Oct-09	
US 2/Roadside safety improvements – Safety improvements (Chelan)	TPA	√	Mar-08	Frank Gurney, Inc.	Oct-08	$418
US 2/Wenatchee – Build trail connection (Chelan)	TPA	Early	Mar-08	Strider Construction Co., Inc.	Nov-08	$1,170
US 2/US 97 Peshastin East – New interchange (Chelan)	Nickel	√	Sep-07	KLB Construction, Inc.	Oct-09	$9,776
SR 112/Seiku vicinity to US 101 – Install guardrail (Clallam)	TPA	√	Feb-08	Petersen Brothers, Inc	Oct-08	$2,596
SR 112/Neah Bay to Seiku – Roadside safety improvements (Clallam)	TPA	√	*Combined with the project above for construction efficiencies*			
E Olympic Peninsula – Roadway safety improvements (Clallam, Jefferson, Kitsap, Mason, Pierce)	TPA	√	Mar-08	Petersen Brothers, Inc	Oct-08	$1,788
US 101/Blyn vicinity – Add passing lanes (Clallam)	Nickel	√	May-08	Bruch & Bruch Construction Inc.	Nov-08	$1,602
I-205/Mill Plain Exit (112th Connector) – Build ramp (Clark)	Nickel	Early	Mar-08	Selby Bridge Company, Inc.	Dec-09	$14,875
I-205/Mill Plain Interchange to NE 18th St – Stage 1 (Clark)	TPA	Early	*Combined with the project above for construction efficiencies*			

Advertisement Record

61 Projects in construction phase as of September 30, 2008

Nickel and Transportation Partnership Account (TPA) projects, dollars in thousands

Project description	Fund type	On time advertised	Ad date	Contractor	Operationally complete date	Award amount
US 101/W Fork Hoquiam River Bridge – Replace bridge 101/142 (Grays Harbor)	TPA	√	Mar-08	Ross Bros. & Company, Inc.	Feb-09	$3,545
US 101/W Fork Hoquiam River Bridge – Replace bridge 101/145 (Grays Harbor)	TPA	√	*Combined with the project above for construction efficiencies*			
I-405/Bridges – Seismic (King)	TPA	√	Feb-08	KLM Construction	Dec-08	$916
SR 522/University of Washington Bothell – Build interchange (King)	TPA	Late	Oct-07	Mowat Construction Company	Oct-09	$36,651
Advertisement date delay due to environmental permit issues. The project was originally advertised in January 2007 and then pulled from ad due to budget constraints. The project was re-advertised in October 2007 and was awarded in January 2008.						
SR 900/SE 78th St vicinity to I-90 vicinity – Widening and HOV (King)	Nickel	√	May-08	Icon Materials, a Division of CPM	Oct-09	$19,354
I-5/Boston St to E Shelby St – SB I-5, Westside – Noise wall (King)	TPA	√	Mar-08	C. A. Carey Corp.	Apr-10	$5,376
I-5/5th Ave NE to NE 92nd St – Noise wall (King)	TPA	√	Feb-08	Wilder Construction Co.	Jun-10	$3,315
SR 519/ I-90 to SR 99 Intermodal Access Project – Interchange improvements (King)	Nickel	Early	Jun-08	Kiewit Pacific Co.	Jul-10	$66,969
SR 11, SR 525, and SR 900 – Roadside safety improvements (King, Snohomish, Skagit)	TPA	√	Feb-08	Coral Construction Company	Dec-10	$1,463
SR 9, SR 11, and SR 20 – Roadside safety improvements (Skagit)	TPA	√	*Contract combined with the one above*			
SR 542 and SR 547 – Roadside safety improvements (Whatcom)	TPA	√	*Contract combined with the one above*			
SR 16/Burley-Olalla Interchange – Build interchange (Kitsap)	Nickel	Late	Apr-08	Ceccanti, Inc.	Aug-10	$16,329
The delay is to allow time to address continuing design review issues including temporary erosion control and utility boring designs.						
SR 142/Roadside Safety – Roadside improvements (Klickitat)	TPA	Early	Mar-08	Dirt and Aggregate Interchange	Oct-10	$300
SR 6/S Fork Chehalis River Bridge – Replace bridge (Lewis)	TPA	√	May-08	Scarcella Bros., Inc.	Dec-09	$7,854
US 101/SR 3 On Ramp to US 101 Northbound – Add new ramp (Mason)	TPA	Early	Feb-08	Tri-State Construction, Inc.	Dec-08	$2,373
Advancement was made to complete this work prior to the scheduled closing of Hood Canal Bridge.						
US 97/Brewster vicinity – Install lighting (Okanogan)	TPA	Early	May-08	Hurst Construction, LLC	Oct-08	$807
SR 161/SR 167 Eastbound Ramp – Realign ramps (Pierce)	Nickel	√	Mar-08	Icon Materials	Oct-08	$2,192
SR 704/Cross Base Highway – New alignment (Pierce)	TPA	Early	Mar-08	Ceccanti, Inc	Jun-09	$7,350
Advancement was made to construct the first stage of the project at the east end of the corridor and to finish right-of-way efforts within the 07-09 biennium.						
SR 9/Lake Stevens Way to 20th St SE – Improve intersection (Snohomish)	TPA	√	Apr-08		Sep-09	
This is a WSDOT project administered by Snohomish County in order to coordinate more effectively with locally managed projects to improve cost and construction efficiencies.						

WSDOT's Capital Project Delivery Programs

Advertisement Record

61 Projects in construction phase as of September 30, 2008

Nickel and Transportation Partnership Account (TPA) projects, dollars in thousands

Project description	Fund type	On time advertised	Ad date	Contractor	Operationally complete date	Award amount
SR 9/176th St SE vicinity to SR 96 – Add signal and turn lanes (Snohomish)	Nickel	√	Jan-08	Scarsella Bros. Inc.	Mar-10	$18,878
SR 9/Marsh Rd Intersection – Safety improvements (Snohomish)	TPA	√	*Combined with the project above for construction efficiencies*			
SR 9/SR 96 to Marsh Rd – Add lanes and improve intersections (Snohomish)	TPA	√	*Combined with the project above for construction efficiencies*			
I-5/Grand Mound to Maytown Stage One – Add lanes (Thurston)	Nickel	√	Dec-07	Scarsella Bros., Inc.	Jun-10	$61,495
US 12/Frenchtown vicinity to Walla Walla – Add lanes (Walla Walla)	TPA	√	Dec-07	Apollo, Inc	Oct-09	$33,733
SR 539/Tenmile Road to SR 546 – Widening (Whatcom)	Nickel	√	Dec-07	Max J. Kuney Company	Oct-09	$53,987
US 12/Naches River N of Yakima – Stabilize slopes (Yakima)	TPA	√	Nov-07	Scarsella Bros., Inc	Oct-08	$1,516
Quarter ending September 30, 2008						
Central King to South Snohomish Bridges – Seismic (King, Snohomish)	TPA	√	Jul-08	Granite Northwest, Inc. Dba Wilder	Dec-10	$6,734
Lincoln Co – Roadside safety improvements (Lincoln)	TPA	√	Aug-08	Coral Const. Co.	Apr-09	$596
I-5/SR 16 Interchange – Rebuild interchange (Pierce)	TPA	√	Jul-08	Guy F. Atkinson Construction LLC	Jul-10	$119,925
SR 530/Sauk River (Site #2) – Stabilize river bank (Snohomish)	TPA	Early	Aug-08	Jansen Inc.	Oct-08	$2,115
US 395/NSC-US 2 to Wandermere and US 2 – Lowering, new alignment (Spokane)	Nickel	√	Aug-08		May-11	

	On time advertised	Award amount
Totals current quarter (September 30, 2008)	**100%**	**$9,445**
1 Nickel project	100%	$0
4 TPA projects	100%	$129,370
Totals biennium to date (2007-09)	**95%**	**$505,998**
11 Nickel projects	91%	$265,457
31 TPA projects	97%	$240,541
Totals cumulative to date (Projects under way)	**90%**	**$1,191,337**
18 Nickel projects	83%	$562,412
43 TPA projects	93%	$628,925

Data Source: WSDOT Project Control and Reporting Office

* As established by the 2005 Legislative Evaluation and Accountability Program (LEAP) committee. However, dollars shown are for all fund types, not just Nickel or Transportation Partnership Account funds.

Projects To Be Advertised

43 Projects in the delivery pipeline for October 1, 2008, through March 31, 2009

Nickel and Transportation Partnership Account (TPA) projects now being advertised for construction or planned to be advertised, costs estimated at completion, dollars in thousands

Project Description	Fund type	Original planned ad date	Current planned ad date	On schedule	Baseline estimated cost	Current estimated cost
SR 26/Othello vicinity – Roadside safety improvements (Adams)	TPA	Feb-09	Feb-09	√	$714	$714
US 395/Columbia Dr to SR 240 – Rebuild interchange (Benton)	TPA	Oct-08	Oct-08	√	$22,724	$22,480
SR 240/Beloit Rd to Kingsgate Way – Widen roadway (Benton)	TPA	Jan-09	Jan-09	√	$16,872	$17,625
SR 150/W of Chelan – Install lighting (Chelan)	TPA	Nov-08	Dec-08	√	$266	$286
SR 971/S Lakeshore Rd – Install lighting (Chelan)	TPA	Nov-08	Dec-08	√	$109	$116
SR 285/George Sellar Bridge – Additional eastbound lane (Chelan, Douglas)	TPA	Dec-08	Jan-09	Delayed	$13,491	$15,830
Advertisement date was delayed one month to address additional bridge analysis, design, and detailing requirements, and to purchase railroad easements.						
US 101/Sol Duc River Bridge – Upgrade bridge rail (Clallam)	Nickel	Mar-09	Mar-09	√	$386	$414
SR 4 and SR 401 – Roadside safety improvements (Cowlitz, Pacific, Wahkiakum)	TPA	Feb-09	Feb-09	√	$700	$700
US 2/S of Orondo – Add passing lane (Douglas)	TPA	Nov-08	Dec-08	√	$3,364	$3,628
SR 28/Jct US 2 and US 97 to 9th St, Stage 1 – New alignment (Douglas)	TPA	Oct-09	Jan-09	Advanced	$53,910	$58,122
N Stevens and Ferry Co – Roadside safety improvements (Ferry, Stevens)	TPA	Aug-08	Dec-08	Delayed	$900	$900
Advertisement date was delayed due to environmental permit issues.						
SR 17/Moses Lake to Ephrata – Widening (Grant)	TPA	Nov-08	Nov-08	√	$5,000	$5,000
SR 17/N of Moses Lake – Add passing lane (Grant)	TPA	Nov-08	Nov-08	√	$1,306	$1,433
SR 532/Sunrise Blvd to Davis Slough – Improve safety (Island)	TPA	Apr-09	Oct-08	Advanced	$4,747	$4,747
I-5/Boeing Access Rd vicinity to King/Snohomish county line – Pavement repair (King)	Nickel	Oct-08	Oct-08	√	$21,000	$21,000
I-90/Eastside Bridges – Seismic (King)	TPA	Oct-08	Oct-08	√	$7,857	$8,337
I-405/SR 167 to SR 169 – Add new southbound lane (King)	Nickel	Oct-08	Oct-08	√	$55,461	$58,055
I-405/SR 167 to SR 169 – Northbound widening (King)	TPA	Oct-08	Oct-08	√	$6,769	$5,029
I-405/SR 515 – New interchange (King)	TPA	Oct-08	Oct-08	√	$113,362	$112,541
I-90/I-5 to 12th Ave S – Seismic retrofit (King)	TPA	Oct-08	Oct-08	√	$10,360	$14,420
I-5 and SR 520 – Guardrail retrofit, safety (King)	Nickel	Dec-08	Dec-08	√	$3,269	$2,615
I-405/NE 8th St to SR 520 braided ramps – Interchange improvements (King)	TPA	Mar-09	Mar-09	√	$255,301	$280,527
SR 160/SR 16 to Longlake Rd vicinity – Widening (Kitsap)	Nickel	Jan-09	Jan-09	√	$8,525	$8,957

WSDOT's Capital Project Delivery Programs

Projects To Be Advertised

43 Projects in the delivery pipeline for October 1, 2008, through March 31, 2009

Nickel and Transportation Partnership Account (TPA) projects now being advertised for construction or planned to be advertised, dollars in thousands

Project Description	Fund type	Original planned ad date	Current planned ad date	On schedule	Baseline estimated cost	Current estimated cost
SR 307/SR 104 Safety Corridor Study – Spot improvements (Kitsap)	TPA	Nov-08	Nov-08	√	$5,000	$5,000
SR 305/Unnamed Tributary to Liberty Bay – Fish passage barrier (Kitsap)	TPA	May-08	Mar-09	Delayed	$1,821	$1,984
Delay is due to negotiations with resource agencies subsequent to combining this project with another fish barrier removal project for efficiency.						
I-90/Snoqualmie Pass East – Hyak to Keechelus Dam – Corridor improvement (Kittitas)	TPA	Oct-09	Feb-09	Advanced	$545,000	$594,297
US 101/Hoodsport vicinity – Stabilize slope (Mason)	TPA	Jun-08	Dec-08	Delayed	$544	$602
Project advertisement has been delayed due to additional time needed for the ESA (Endangered Species Act) compliance and other state water quality permits.						
SR 3/Jct US 101 to Mill Creek – Safety (Mason)	TPA	Mar-09	Mar-09	√	$2,299	$2,509
Increase due to inflation applied August 2008.						
SR 20/W of Okanogan – Roadside safety improvements (Okanogan)	TPA	Oct-08	Dec-08	√	$1,200	$1,200
Spokane, Stevens, and Pend Oreille Co – Roadside safety improvements (Pend Oreille, Spokane, Stevens)	TPA	Aug-08	Dec-08	Delayed	$1,010	$1,011
Advertisement date was delayed due to environmental permit issues.						
I-5/Fischer Creek Vicinity – Stormwater drainage improvements (Skagit)	TPA	Jan-09	Mar-09	√	$285	$319
SR 92, SR 520, SR 530, and SR 534 – Roadside safety improvements (Snohomish)	TPA	Feb-09	Feb-09	√	$1,000	$1,000
SR 532/General Mark W. Clark Memorial Bridge – Replace bridge (Snohomish)	TPA	Apr-09	Oct-08	Advanced	$19,450	$19,579
SR 532/General Mark W. Clark Memorial Bridge – Improve safety (Snohomish)	TPA	Apr-09	Oct-08	Advanced	$14,683	$14,683
SR 532/64th Ave NW to 12th Ave NW – Improve safety (Snohomish)	TPA	Jul-09	Oct-08	Advanced	$23,734	$23,734
SR 532/270th St NW to 72nd Ave NW – Improve safety (Snohomish, Island)	TPA	May-08	Oct-08	Delayed	$19,552	$19,875
This is a design-build project. The RFP (Request for Proposals) advertising date has been delayed due to additional time needed to acquire environmental permits and right-of-way parcels.						
I-5/172nd St NE (SR 531) Interchange – Rebuild interchange (Snohomish)	TPA	Oct-08	Oct-08	√	$44,612	$44,608
I-5/Bakerview Rd to Nooksack River Br-Slater Rd interchange – Safety improvements (Whatcom)	Nickel	Oct-08	Oct-08	√	$120	$121
SR 542/Nooksack River – Redirect river and realign roadway (Whatcom)	TPA	Mar-08	Jan-09	Delayed	$16,574	$16,576
Ad date delay due to additional time needed to reach a settlement on a privately owned right-of-way parcel that is required for the project. The project was advertised in May, 2008 and then pulled from ad. FHWA right-of-way certification requirements were not met prior to bid opening. Advertisement is rescheduled for January 2009 to keep the in-water construction work within the July 1 to September 30th fish window.						

Projects To Be Advertised

43 Projects in the delivery pipeline for October 1, 2008, through March 31, 2009

Nickel and Transportation Partnership Account (TPA) projects now being advertised for construction or planned to be advertised, dollars in thousands

Project Description	Fund type	Original planned ad date	Current planned ad date	On schedule	Baseline estimated cost	Current estimated cost
I-5/Chuckanut Creek vicinity – Stormwater drainage improvements (Whatcom)	TPA	Jan-09	Mar-09	√	$1,145	$1,282
I-5/Padden Creek vicinity – Stormwater drainage improvements (Whatcom)	TPA	Jan-09	Mar-09	√	$521	$585
I-5/Squalicum Creek vicinity – Stormwater drainage improvements (Whatcom)	TPA	Jan-09	Mar-09	√	$420	$470
I-5/Dakota Creek vicinity – Stormwater drainage improvements (Whatcom)	TPA	Jan-09	Mar-09	√	$793	$891

Projects to be advertised	Percent on schedule	Baseline estimated cost at completion	Current estimated cost at completion
Total (October 1, 2008, through March 31, 2009)	**84%**	**$1,306,156**	**$1,393,803**
6 Nickel projects	100%	$88,760	$91,163
37 TPA projects	81%	$1,217,396	$1,302,640

Data Source: WSDOT Project Control and Reporting Office.

WSDOT's Capital Project Delivery Programs

Project Milestones: Nickel projects

Schedule milestone tracking for Nickel projects

Scheduled milestone results for all Nickel projects with one or more milestone activities

Milestone	Scheduled milestones to date	Scheduled milestones achieved to date	Scheduled milestones not achieved	Scheduled milestone achievement rate**	Milestones achieved early
Project definition complete					
Biennium to date (2007-09)	1	4	0	400%	1
Cumulative to date	138	150	1	109%	13
Begin preliminary engineering					
Biennium to date (2007-09)	8	8	0	100%	0
Cumulative to date	148	153	0	103%	5
Environmental documentation complete					
Biennium to date (2007-09)	18	16	2	89%	0
Cumulative to date	129	126	3	98%	0
Right-of-way certification					
Biennium to date (2007-09)	15	14	1	93%	1
Cumulative to date	70	73	2	104%	5
Advertisement date*					
Biennium to date (2007-09)	15	13	1	87%	1
Cumulative to date	122	122	1	100%	1
Operationally complete					
Biennium to date (2007-09)	34	35	0	103%	5
Cumulative to date	96	104	0	108%	8

Source: WSDOT Project Control and Reporting Office
* Advertisement date includes projects that went to ad & completed in the same quarter.
** Achievement rate may be higher than 100% where the actual number of milestones achieved exceed the number of scheduled milestones. This results when milestones are achieved ahead of their scheduled dates.

Milestone Definitions:.

Project definition complete
Project definition is the preliminary picture of what a project will achieve and generally how it will do so. It includes deficiencies being addressed, the purpose for a project, location, and project information to the best available level. It is not a true project scope (that requires design effort) but it does support the very first preliminary cost estimate.

Begin preliminary engineering
A project schedule usually has two general phases, the pre-construction phase and the construction phase. Pre-construction involves design, right-of-way, and environmental activities. Beginning the preliminary engineering marks the start of the project design and is usually the first capital spending activity in the delivery process.

Environmental documentation complete
The National Environmental Policy Act (NEPA) and the State Environmental Policy Act (SEPA) require that an appropriate level of environmental assessment be prepared for almost all WSDOT projects. Depending on the project, these can take the form of an Environmental Impact Statement (EIS) or another document of lesser scale. These assessments end in the issuance of a Record of Decision (ROD) or other summary document. This milestone is the date that WSDOT will have finished and submitted to the appropriate regulatory agencies, the documentation for the ROD and/or issuance of permits.

Right-of-way certification
Often WSDOT projects require the acquisition of right of way or property rights. The right-of-way certification marks the point in time that right-of-way acquisition requirements are met and the process is complete for advertisement.

Advertisement date
The date that WSDOT schedules to publicly advertise a project for bids from contractors. When a project is advertised, it has a completed set of plans and specifications, along with a construction cost estimate.

Operationally complete
The date when the public has free and unobstructed use of the facility. In some cases, the facility will be open, but minor work items may remain to be completed.

Project Milestones: TPA projects

Schedule milestone tracking for TPA projects

Scheduled milestone results for all TPA projects with one or more milestone activities

Milestone	Scheduled milestones to date	Scheduled milestones achieved to date	Scheduled milestones not achieved	Scheduled milestone achievement rate**	Milestones achieved early
Project definition complete					
Biennium to date (2007-09)	30	46	2	153%	5
Cumulative to date	197	215	3	109%	21
Begin preliminary engineering					
Biennium to date (2007-09)	40	41	3	103%	3
Cumulative to date	206	219	5	106%	18
Environmental documentation complete					
Biennium to date (2007-09)	86	89	7	103%	6
Cumulative to date	156	157	9	101%	10
Right-of-way certification					
Biennium to date (2007-09)	44	36	12	82%	7
Cumulative to date	72	73	12	101%	13
Advertisement date*					
Biennium to date (2007-09)	57	52	7	91%	4
Cumulative to date	107	105	7	98%	5
Operationally complete					
Biennium to date (2007-09)	36	40	1	111%	13
Cumulative to date	50	63	1	126%	14

Source: WSDOT Project Control and Reporting Office
* Advertisement date includes projects that went to ad & completed in the same quarter.
** Achievement rate may be higher than 100% where the actual number of milestones achieved exceed the number of scheduled milestones. This results when milestones are achieved ahead of their scheduled dates.

Milestone Definitions:.

Project definition complete
Project definition is the preliminary picture of what a project will achieve and generally how it will do so. It includes deficiencies being addressed, the purpose for a project, location, and project information to the best available level. It is not a true project scope (that requires design effort) but it does support the very first preliminary cost estimate.

Begin preliminary engineering
A project schedule usually has two general phases, the pre-construction phase and the construction phase. Pre-construction involves design, right-of-way, and environmental activities. Beginning the preliminary engineering marks the start of the project design and is usually the first capital spending activity in the delivery process.

Environmental documentation complete
The National Environmental Policy Act (NEPA) and the State Environmental Policy Act (SEPA) require that an appropriate level of environmental assessment be prepared for almost all WSDOT projects. Depending on the project, these can take the form of an Environmental Impact Statement (EIS) or another document of lesser scale. These assessments end in the issuance of a Record of Decision (ROD) or other summary document. This milestone is the date that WSDOT will have finished and submitted to the appropriate regulatory agencies, the documentation for the ROD and/or issuance of permits.

Right-of-way certification
Often WSDOT projects require the acquisition of right of way or property rights. The right-of-way certification marks the point in time that right-of-way acquisition requirements are met and the process is complete for advertisement.

Advertisement date
The date that WSDOT schedules to publicly advertise a project for bids from contractors. When a project is advertised, it has a completed set of plans and specifications, along with a construction cost estimate.

Operationally complete
The date when the public has free and unobstructed use of the facility. In some cases, the facility will be open, but minor work items may remain to be completed.

Paying for the Projects: 2003 Transportation Funding Package (Nickel) financial information

Revenue forecast update

The following information incorporates the September 2008 transportation revenue forecast. The accompanying charts compare the current projected revenue forecast to the baseline forecast used in the budget making process when the 2003 Funding Package was adopted. The 2003 Funding Package was developed as a ten-year plan from 2003 through 2013. Due to timing and funding issues, the 2007 Legislature moved projects beyond 2013. Both cumulative ten-year totals and individual biennial amounts are shown in the chart below.

Current forecasted revenues include the most recent actual revenue collection data available as well as updated projections based on new and revised economic variables.

The September 2008 forecast for gas tax receipts and licenses, permits, and fees for the Transportation 2003 (Nickel) Account is lower than the baseline forecast for the ten-year outlook by 8.5%. This reduction is due to projected higher gasoline prices that result in lower gasoline consumption. Because Washington State's gas tax is based on gallonage rather than price, reduced consumption results in reduced revenues.

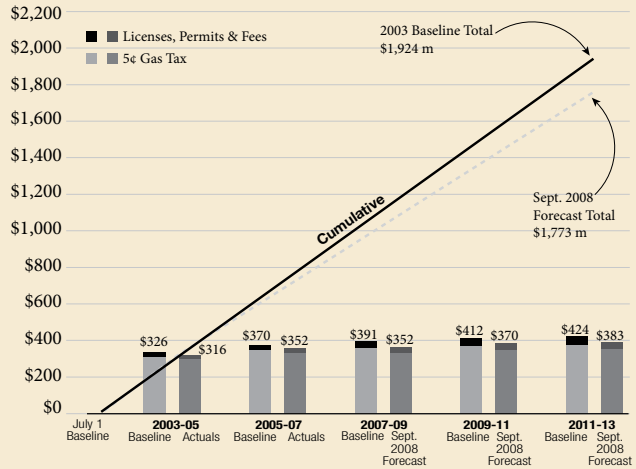
Multimodal Account projections for the vehicle sales tax is lower than the baseline forecast resulting in a decrease of 4.2% in the ten-year outlook.

2003 Transportation Funding Package highlights

Deposited into the Transportation 2003 (Nickel) Account (established in 2003)

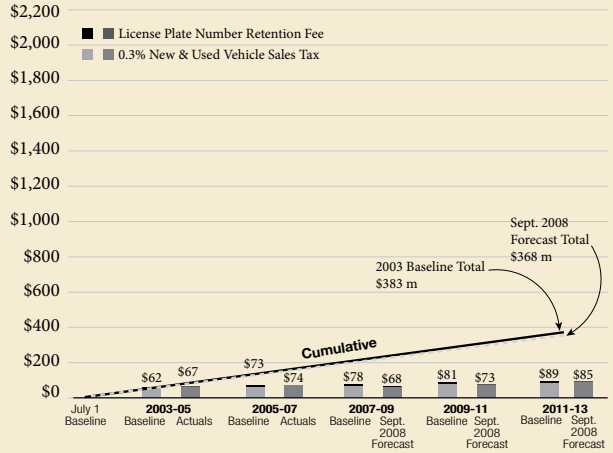
- 5¢ increase to the gas tax
- 15% increase in the gross weight fees on trucks
- Deposited into the Multimodal Account (established in 2000)
- An additional 0.3% sales tax on new and used vehicles
- $20 license plate number retention

Transportation 2003 (Nickel) account revenue forecast
March 2003 Legislative baseline compared to September 2008 Transportation Revenue Forecast Council
Dollars in millions



Data Source: Financial Planning.
Data Note: Numbers may not add due to rounding.

Multimodal Account (2003 Package) revenue forecast
March 2003 Legislative baseline compared to September 2008 Transportation Revenue Forecast Council
Dollars in millions



Data Source: Financial Planning.
Data Note: Numbers may not add due to rounding.

Paying for the Projects: Transportation Partnership Account financial information

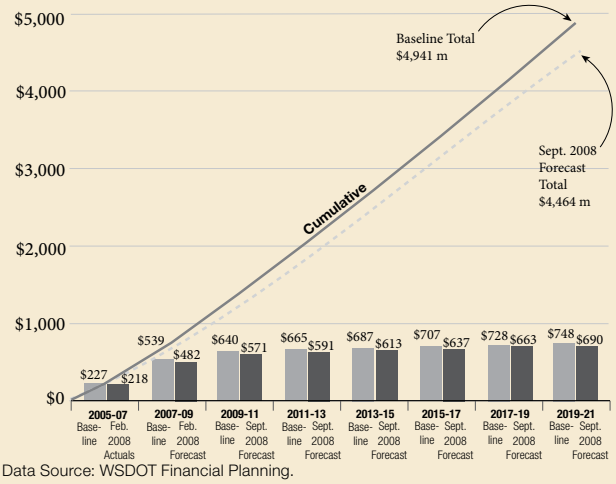
Revenue forecast update

The accompanying chart compares the current September 2008 revenue forecast to the "baseline" forecast used in the budget making process when the 2005 Funding Package was adopted. The 2005 Funding Package was developed as a 16-year plan extending from 2005 through 2021.

The September 2008 forecast for gas tax receipts over the 16 year period decreased by 10.7% from the baseline forecast. This reduction is due to projected higher gasoline prices that result in lower gasoline consumption. Because Washington State's gas tax is based on gallonage rather than price, reduced consumption results in reduced revenues.

Transportation Partnership Account (TPA) gas tax revenue forecast

March 2005 Legislative baseline compared to September 2008 Transportation Revenue Forecast Council
Dollars in millions



Data Source: WSDOT Financial Planning.
Data Note: Numbers may not add due to rounding.

2005 Transportation Funding Package revenue sources

- 9.5¢ increase to the gas tax phased in over four years.
  - 3.0¢ in July 2005
  - 3.0¢ in July 2006
  - 2.0¢ in July 2007
  - 1.5¢ in July 2008
- New vehicle weight fees on passenger cars.
  - $10 for cars under 4,000 pounds
  - $20 for cars between 4,000 and 6,000
  - $30 for cars between 6,000 and 8,000
- Increased combined license fees for light trucks
  - $10 for trucks under 4,000 pounds
  - $20 for trucks between 4,000 and 6,000 pounds
  - $30 for trucks between 6,000 and 8,000 pound
- Farm vehicles are exempt from the increase
- A $75 fee for all motor homes
- Fee increases to various driver's license services
  - Original and Renewal License Application increased to $20 (previously $10)
  - Identicards, Driver Permits and Agricultural Permits increased to $20 (previously $15)
  - Commercial Driver License and Renewal increased to $30 (previously $20)
  - License Reinstatement Fee Increased to $75 (previously $20)
- DUI Hearing increased to $200 (previously $100)
- Fee increases to various license plate charges
  - Reflectorized Plate Fee increased to $2 per plate (previously 50¢)
  - Replacement Plates increased to $10 (previously $3).

WSDOT's Capital Project Delivery Programs

Pre-Existing Funds (PEF) Programmatic Reporting

The Pre-Existing Funds (PEF) program funds a wide variety of capital projects to improve the safety, functionality, and longevity of the state highway system. Unlike Nickel and Transportation Partnership Account (TPA) projects, which are fixed lists of projects set by the Legislature and funded with a line item budget for each individual project, PEF projects are funded at the program level. Funding is aligned to commitments to address set priorities such as preserving pavement each biennium. Each biennium, new PEF projects are programmed based on prioritized needs and available funds, and the list of PEF projects changes each biennium.

Examples of PEF projects include: pavement preservation and repaving, bridge repairs and replacement, slope stabilization, safety projects such as cable median barriers and rumble strips, environmental retrofit to improve fish passage and stormwater management, and preservation of facilities associated with the highway system such as rest areas.

PEF performance is reported at two levels:

Six individually tracked projects:

- Six projects are reported individually due to their size or significance (in this *Gray Notebook* edition, see below and the following page for schedule and budget information on these projects)

All other projects:

WSDOT reports on:

- On achievement of project milestones by type of project (in this *Gray Notebook* edition).
- Actual versus planned cash flow for the overall PEF program (in this *Gray Notebook* edition).
- Physical results of the work, such as the number of miles paved, number of bridges retrofitted, etc., will be included in the next *Gray Notebook*.
- Before and After results on selected types of projects. Examples include: pavement conditions (see *Gray Notebook* 28, p 53), and reductions in accidents (see *Gray Notebook* 30, p6).

Six individually tracked PEF projects: results through September 30, 2008
Dollars in millions

Project description	First legislative budget	Baseline: current legislative approved	Scheduled date to begin preliminary engineering	On time	Scheduled date for advertise-ment	On time	Scheduled or actual date to be operation-ally complete
US 2/Ebey Island Viaduct and Ebey Slough Bridge (Snohomish)	$32.1 (2002)	$6.2 (2007)	Dec-98	√	Nov-00	√	Dec-03
• US 2/50th Avenue SE Vic to SR 204 vicinity - Bridge rehabilitation		$10.8 (2007)	Jul-06		Feb-07		Sep-07
This is stage one of the original US 2/Ebey Viaduct and Ebey Slough Bridge project.							
• US 2/43rd Ave SE vicinity to 50th Ave SE vicinity - Bridge rehabilitation		$22.6 (2007)	Jan-09		Aug-10		Dec-11
SR 202/SR 520 to Sahalee Way - Widening (King)	$36.9 (2001-03)	$82.7 (2007)	May-98	√	Aug-05	√	Feb-08
SR 539/Horton Road to Tenmile Road - Widen to five lanes (Whatcom)	$32.0 (2001-03)	$66.3 (2007)	Oct-90	√	Jan-07	√	Oct-08
Please see note on the following page regarding escalations in materials costs for this project.							
SR 28/East end of the George Sellar Bridge - Construct bypass (Douglas)	$9.4 (2004)	$22.9 (2007)	May-04	√	Jul-10	Late	Dec-11
The construction phase has been delayed to balance the financial plan 07-09 biennium Legislative book. See note on the following page.							
US 101/Purdy Creek Bridge - Replace bridge (Mason)	$6.0 (2004)	$15.1 (2007)	Aug-04	√	May-08	Late	Sep-09
Advertisement date delayed due to additional design work needed when plans came back from consultant.							
SR 303/Manette Bridge Bremerton vicinity - Replace bridge (Kitsap)	$25.5 (2002)	$69.0 (2007)	Sep-96	√	Mar-10	√	Jun-13
The construction phase has been delayed to balance the financial plan 07-09 biennium Legislative book.							

Data Source: WSDOT Project Control and Reporting Office.

Pre-Existing Funds (PEF) Projects

Watchlist concerns for the six individually tracked PEF projects

SR 539/Horton Road to Tenmile Road - Widen to five lanes (Whatcom)

Budgeted for $67.7 million, this project will widen SR 539 to four lanes with a continuous two-way left-turn lane between Horton Road and Tenmile Road. Other improvements include replacing two bridges and a culvert at Deer Creek, drainage construction, reconstructing traffic signals at three intersections, and illumination. The work will relieve congestion and increase traffic capacity.

The project's budget continues to be at risk. A $3.2 million construction cost increase was reported last quarter due to added utility relocations, higher material quantities and additional work required during last winter because of unusually wet weather. WSDOT is offsetting this increase with construction savings on other projects.

Continued price escalation in asphalt and fuel has resulted in an additional $630,000 cost increase, however the project remains on schedule to be operationally complete by October 2008.

SR 28/E End George Sellar Bridge – Construct bypass (Douglas)

This project, one of three involving the George Sellar Bridge, is budgeted for $22.9 million. It will construct a bypass route for southbound traffic, to improve capacity overall and reduce accidents at the George Sellar Bridge east end. Funding for a pedestrian tunnel is included.

The project is in the design phase; its budget is at risk. The estimated right-of-way costs have increased due to higher-than-expected commercial property values; construction costs have increased due to inflation; and preliminary engineering costs have increased due to a significant amount of coordination work with local agencies and adjacent projects. These risks have increased the total project cost estimate to $27.6 million.

The project schedule is also at risk, with the ad date delayed nine months and the operationally complete date delayed three months. The delays are to match the available funding in the 2009-11 budget process. The cost increase and schedule adjustment will be included for consideration in the 2009-11 budget process.

Milestone tracking for Pre-Existing Funds (PEF) projects

Number of projects with these milestones, 2007-2009 biennium to date, milestone and expenditure achievement to date
Dollars in millions

	Begin engineering		Advertised for bids		Operationally complete		Expenditures	
Programmatic categories*	**Planned**	**Actual**	**Planned**	**Actual**	**Planned**	**Actual**	**Planned**	**Actual**
Pavement preservation	71	67	60	54	116	125	$178	$177
Bridges (preservation/replacement)	26	25	23	20	15	17	$82	$61
Slope stabilization	11	13	13	16	12	13	$26	$19
Safety (roadside, rumble strips, median cross-over, etc.)	30	28	35	29	32	42	$65	$68
Environmental retrofit (fish passage improvement, stormwater runoff)	8	8	5	3	4	6	$9	$6
Other facilities (rest area, weigh stations, etc.)	7	8	14	13	26	29	$156	$113
Totals	**153**	**149**	**150**	**135**	**205**	**232**	**$516**	**$444**

Data Source: WSDOT Project Control and Reporting Office.

* While elements of one or more categories may be included in some of the projects (such as a bridge preservation project that improves safety), every project has been assigned to one primary category for reporting purposes.

WSDOT's Capital Project Delivery Programs

Pre-existing Funds (PEF) Projects: Advertisement and financial overviews

136 PEF projects advertised

The 2007-09 Highway Construction Program includes 159 PEF advertisements planned for the 2007-2009 biennium through the quarter ending September 30, 2008.

In those five quarters, 136 advertisements were achieved. Of the 159 scheduled since the start of the biennium, 17 were delayed to future quarters of this biennium, five were deferred to future biennia, and one project was deleted.

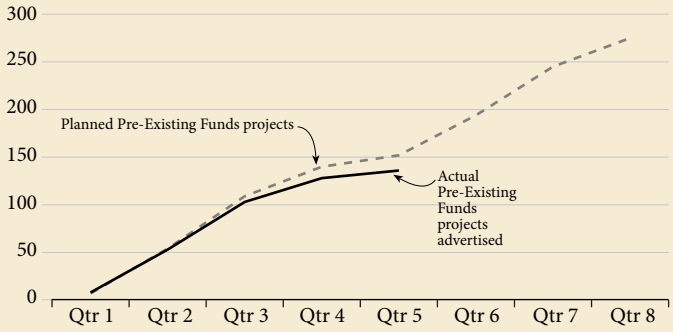
Pre-Existing Funds projects: Biennial progress
July 1, 2007 through September 30, 2008

WSDOT total award estimate*:	$144.4 M
Actual total award amount*:	**$135.0 M**
Projects advertised (see page 101 for definitions)	
As Scheduled	119
Early	9
Late	5
Emergent	3
Total projects advertised 2007-Sept 30, 08	**136**
Projects Delayed (delayed within the biennium)	17
Projects Deferred (delayed out of the biennium)	5
Projects Deleted	1

Data Source: WSDOT Project Control & Reporting Office.

* In cases where the Department's Estimate and Award amounts contain multiple sources, the PEF reported amount is a calculated percentage based on the contract total value. PEF projects may have Nickel and TPA funding not reported in this section.

Highway construction program advertisements: Pre-Existing Funds projects
Planned vs. actual number of projects advertised
2007-09 biennium, quarter ending September 30, 2008



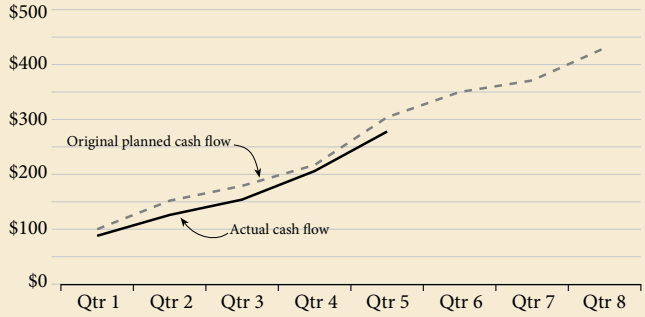
Data Source: WSDOT Project Control and Reporting Office.
Note: PEF data for the quarter ending June 30, 2008 is now available. There were 142 PEF advertisements planned for the 2007-2009 biennium through the quarter ending June 30, 2008. 132 advertisements were achieved in those four quarters. Of the 142 scheduled since the start of the biennium, 12 were delayed to future quarters of this biennium, 3 were deferred to future biennia, and no projects were deleted.

Paying for the projects: Financial information

WSDOT submitted an expenditure plan to the Legislature for the fifth quarter of the biennium totaling approximately $516 million. As of September 30, 2008, actual expenditures totaled $444 million, a variance of approximately $72 million, or 14%, from the biennium plan. The variance as of the end of the fifth quarter for the Highway Construction Program was divided between the Improvement and Preservation programs.

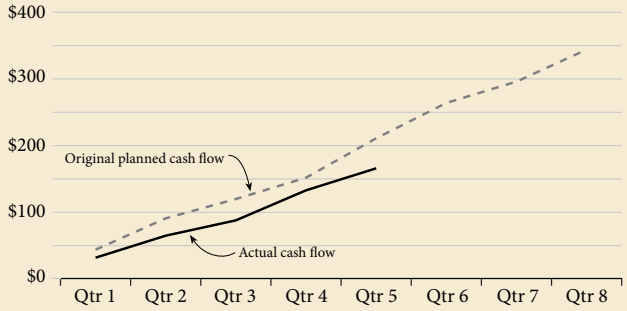
The Preservation Program planned cash flow was $304 million, and actual expenditures were $278 million. This was $26 million under plan, or 9%. The Improvement Program planned cash flow was $211 million, and actual expenditures were $166 million. This was approximately $45 million under plan, or 21%.

Pre-Existing Funds preservation program cash flow
Planned vs. actual expenditures
2007-09 biennium, quarter ending September 30, 2008
Dollars in millions



Data Source: WSDOT Project Control and Reporting Office.
Note: As of Quarter 5 (July 1 - Sept. 30, 2008), Original Planned Cash Flow values have been updated based on the 2008 Supplemental Budget.

Pre-Existing Funds improvement program cash flow
Planned vs. actual expenditures
2007-09 biennium, quarter ending September 30, 2008
Dollars in millions



Data Source: WSDOT Project Control and Reporting Office.
Note: As of Quarter 5 (July 1 - Sept. 30, 2008), Original Planned Cash Flow values have been updated based on the 2008 Supplemental Budget.

Pre-Existing Funds Projects: Advertisement record

Projects scheduled for advertisement or advertised this quarter

July 1, 2008 —September 30, 2008

Project description	On-time advertised
Olympic Region Centerline Rumble Strips 2008 — Safety	Delayed
US 2/One Mile E of Index — Slide	Early
I-5/North Fork Lewis River Bridge Southbound — Expansion joint	Delayed
US 12/Tieton River Vicinity — Unstable slope	Deleted
SR 20/Best Road Pedestrian and Bicyclists — Safety improvements	√
2007-09 Eastern Region Chip Seal — Safety restoration The advertisement date for this project has been delayed to give Region Traffic office additional time to complete the signing plans.	Delayed
SR 26/East of Vantage — Chronic environmental deficiency Project schedule was delayed three months to accommodate workforce issues within the region and is scheduled to be operationally complete fall 2008, on time.	Late
SR 26/Palouse River Bridge — Deck repair	√
I-82/Terrace Heights Off-Ramp — Improvements	Delayed
US 97/8 miles south of US 2 Intersection — Slope stabilization	Advanced
US 97/North of Blewett Pass — Slope stabilization	Advanced
US 101/Northeast Peninsula Safety Rest Area — New facility	Delayed
SR 107/Chehalis River to US 12 — Paving	Deferred
SR 107/Slough Bridges — Replace bridge	Deferred
SR 142/Klickitat Community – Pedestrian improvements	√
SR 261/Smith Hollow Road vicinity — Stabilize slope	Emergent
SR 508/Onalaska — Pedestrian safety improvements	Late

Data Source: WSDOT Project Control and Reporting Office.

A glossary of PEF advertisement terms

Advertisement date
The date that WSDOT schedules to publicly advertise a project for bids from contractors. When a project is advertised, it has a completed set of plans and specifications, along with a construction cost estimate.
A √ mark in the Advertisement record indicates that a project advertised on time within the quarter.

Advanced
A project from a future quarter which has been advertised in the current quarter.

Early
Project with an ad date originally scheduled for the current quarter but occurred in an earlier quarter.

Late
A project that was advertised in the period being reported but which missed the original ad date.

Emergent
A new project that addresses unexpected needs such as emergency landslide repair.

Projects which were not advertised on schedule fall into three categories:

Delayed
A project that has not yet been advertised and which has had the ad date moved out of the quarter being reported to another quarter within the biennium.

Deferred
A project not yet advertised and which has had the ad date moved out of the quarter being reported to a future biennium.

Deleted
A project that, upon review or due to changing circumstances, is no longer required or has been addressed by another project.

Capital Project Delivery Programs

Completed Project Wrap-Ups

Every quarter, WSDOT reports on completed construction projects in the Schedule, Scope & Budget tables in the Beige Pages. These tables summarize all construction activities from beginning of the current biennium to the close of last quarter.

Each of these projects improve travel by making roads safer, trips faster, and more reliable, and improving the environment and economy. Each project also faces unique challenges in being delivered both on-time and on-budget. Building upon the principles of performance journalism, WSDOT will begin publishing a brief wrap-up on each project completed in a quarter, organized by county. These close-out summaries will provide a better sense of the processes involved in delivering projects, WSDOT's efforts to use tax dollars as efficiently as possible, and the benefits citizens can expect to see from completed projects.

Project delivery performance regarding budget and schedule is measured against last legislative expectations in accordance with criteria established by the Legislature; for this quarter, it is the 2008 Supplemental Budget (2008 Final). These wrap- ups include the original project appropriations from the 2003 or 2005 budgets to explain changes in project budgets over time. The project schedule will be reported in more detail in future editions of the *Gray Notebook.*

The graphs offer a visualization of the increases and decreases in a project's cost from year to year. The starting point of the graph has been changed from zero (dollars) to show the range of changes in greater detail.

More information on any completed project remains available on line at its web page at http://www.wsdot.wa.gov/projects/

SR 14/Benton County – Roadside safety improvements (Benton)

What did WSDOT do? Installed guardrail, removed fixed objects, and flattened slopes.

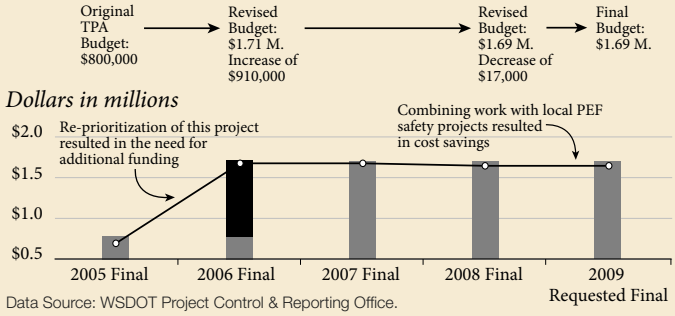
What are the project's benefits? This section of SR 14 experienced 17 collisions in the last two years. Eight of 14 non-alcohol-related collisions involved vehicles running off the road. The improvements were designed to reduce the severity of the collisions.

What was the budget performance? The final project cost was just under $1.7 million, on budget with the last legislative expectations, and about $900,000 above the original FY 2005 appropriations of $800,000 in FY 2005. The budget increased in FY 2006 to include additional high priority work along the SR 14 corridor and fund a preliminary engineering phase omitted in the original budget.

What was the schedule performance? This project was completed five months early in July.

SR 14 Benton County improvements

Estimated annual project budget from conception to final completion



Data Source: WSDOT Project Control & Reporting Office.

The flattened slope adjacent to this curve is expected to reduce severity of run-off road collisions in the area.

Completed Project Wrap-Ups

SR 24/SR 241 to Cold Creek Road – Add passing lane (Benton, Yakima)

What did WSDOT do? Constructed truck climbing and passing lanes eastbound and westbound on SR 24 between SR 241 and Cold Creek Road.

What are the project's benefits? This stretch of SR 24 had five serious collisions in the last two years. The new passing lane was designed to improve motorist safety.

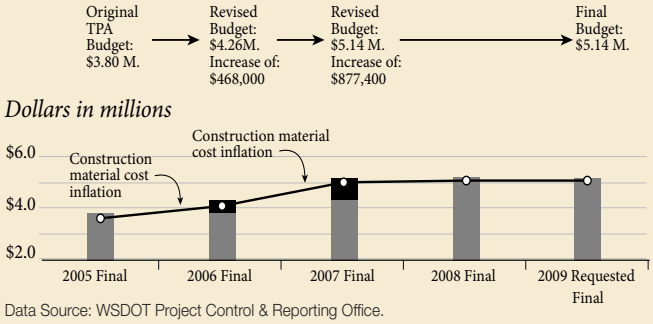
What was the budget performance? This project was completed on budget with last legislative expectations. The original budget of $3.8 million in FY 2005 increased 35% to $5.14 million to accommodate rising material costs in 2007. By comparison, Washington State's Construction Cost Index increased 31.7% between 2005 and 2007. The final estimate is expected to be $4.4 million, due to decreased costs.

What was the schedule performance? This project was completed two months ahead of schedule.

The newly constructed truck passing lane on SR 24.

SR 24/SR 241 to Cold Creek Road – Add lanes

Estimated annual project budget from conception to final completion



Data Source: WSDOT Project Control & Reporting Office.

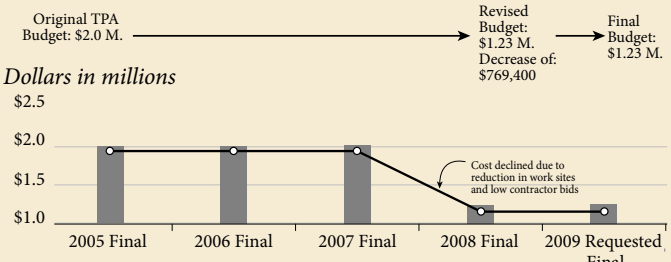
West Olympic Peninsula – Roadway safety improvements (Clallam, Grays Harbor, Jefferson)

What did WSDOT do? Installed guardrail, removed fixed objects, flattened slopes and improved roadsides.

What are the project's benefits? The project was designed to improve safety on SR 8, US 101, and SR 109 by reducing the severity of collisions at locations with a history of fatality or serious injury collisions. There were 49 non-alcohol-related collisions involving vehicles running off the road in the last two years along these routes.

West Olympic Peninsula roadway safety improvements

Estimated annual project budget from conception to final completion



Data Source: WSDOT Project Control & Reporting Office.

What was the budget performance? This project was completed 35% under its original budget, for $1.23 million. Fewer sites needed to be fixed than anticipated, resulting in $420,000 in reduced costs. Multiple bidders, submitting lower than expected bids, reduced expenditures by an additional $350,000.

What was the schedule performance? This project was completed three weeks ahead of schedule in September.

Capital Project Delivery Programs

Completed Project Wrap-Ups, continued

SR 500/I-205 Interchange - Extend merge lane (Clark)

What did WSDOT do? Lengthened the merge lane on westbound SR 500 in the I-205 interchange.

What are the project's benefits? This project was designed to reduce the risk of collisions and relieve congestion by providing more space to enter and leave the highway. Previously, high traffic volumes at this location, combined with the short merge lane, produced congestion and raised safety concerns. Four of five non-alcohol-related injury collisions in the last two years at this location involved merging.

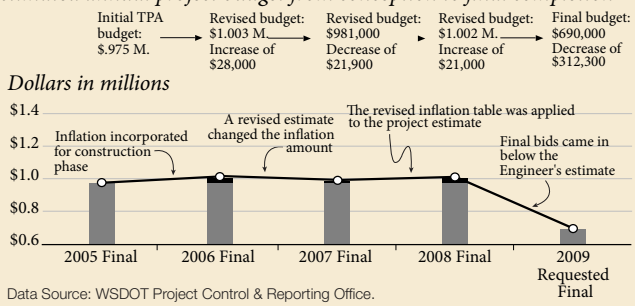
What was the budget performance? This project was completed 31% below the last authorized budget of $1.002 million. The final design was simpler and less expensive than the engineer's estimate and the contractor's bid was lower than anticipated.

What was the schedule performance? This project was completed six months early because of the contractor's aggressive construction schedule.

The lengthened SR 500/ I-205 interchange merging lane under construction.

SR 500/I-205 Interchange improvements

Estimated annual project budget from conception to final completion



Data Source: WSDOT Project Control & Reporting Office.

SR 14/ Lieser Road interchange – Add ramp signal (Clark)

What did WSDOT do? Constructed a traffic signal system at the westbound ramp intersection.

What are the project's benefits? The traffic signal will reduce congestion and improve traffic flow by reducing back-ups caused by high vehicle volume.

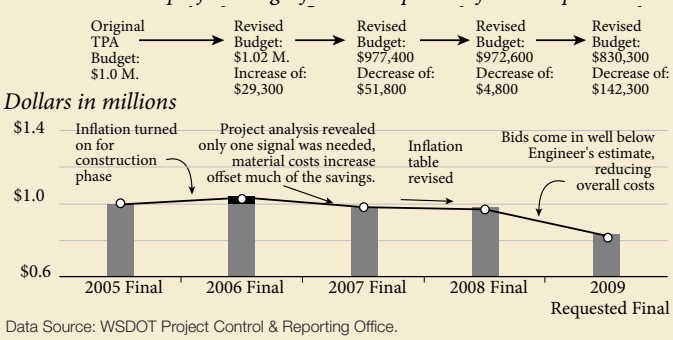
What was the budget performance? This project was completed 14.7% under the 2008 budgeted amount of $973,000. The original appropriation of $1 million in FY 2005 was to cover the proposed installation of signal systems on both off-ramps. Subsequent traffic analysis concluded that congestion would be sufficiently improved with the installation of only the westbound off-ramp signal system. Although construction material cost increases offset some of the savings from the change, one westbound signal system was installed for $830,000.

What was the schedule performance? This project was completed one quarter ahead of schedule.

The signal system at the SR 14 westbound ramp and Lieser Road interchange.

SR 14/Lieser Road interchange ramp signalization

Estimated annual project budget from conception to final completion



Data Source: WSDOT Project Control & Reporting Office.

Completed Project Wrap-Ups, continued

SR 432/Roadside Safety Improvements (Cowlitz)

What did WSDOT do? Removed roadside hazards and installed guardrail to reduce the severity of collisions on SR 432 from Longview to I-5.

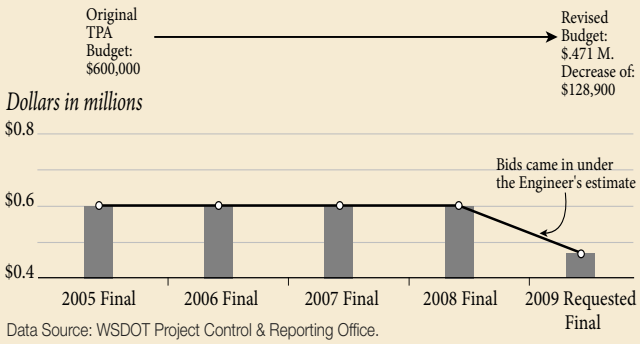
What are the project's benefits? Installed guardrail at selected locations on SR 432 to reduce the severity of run-off-the-road collisions. Two non-alcohol-related collisions along this corridor in the last two years involved vehicles running off the road.

What was the budget performance? The project was completed 22% under budget, at $471,000. Three low bidders anticipated material costs lower than the engineer's estimate.

What was the schedule performance? This project was completed 11 months early in July.

SR 432 Roadside safety improvements

Estimated annual project budget from conception to final completion

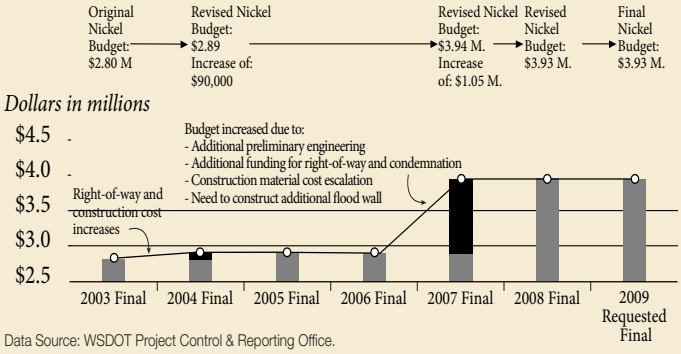


Data Source: WSDOT Project Control & Reporting Office.

Newly installed guardrail along SR 432 in Cowlitz County.

SR 202/SR 203 Junction - construct roundabout

Estimated annual project budget from conception to final completion



Data Source: WSDOT Project Control & Reporting Office.

SR 202/JCT SR 203 - Construct roundabout (King)

What did WSDOT do? Constructed sidewalks and a roundabout at the intersection of SR 202 and SR 203.

What are the project's benefits? There were 39 collisions at this location between 1996 and 2001, before the project was proposed. Roundabouts have been shown to reduce accidents, while the addition of sidewalks will improve pedestrian safety.

What was the budget performance? This project was completed on budget against the most recent legislative expectation at $3.9 million. Construction material cost escalation and the need for an additional wall for flood control added more than $350,000 to the original appropriated amount. Right-of-way acquisition cost $500,000 more than the original estimate. Additional engineering for a roundabout analysis, hazardous material survey and floodplain research added $200,000. However, the final estimated cost is expected to be $500,000 below the last approved budget appropriation.

What was the schedule performance? This project was completed three quarters late, as a result of the additional work.

The SR 202/ SR 203 Junction roundabout.

Completed Project Wrap-Ups, continued

SR 515/SE 182nd St to SE 176th St vicinity – Construct traffic island (King)

What did WSDOT do? This project constructed a raised traffic island and replaced the existing two-way left turn lane; built a left turn lane at the entrance to the Fred Meyer parking lot; relocated existing traffic signals; and adjusted signal timing to allow for U-turn movement.

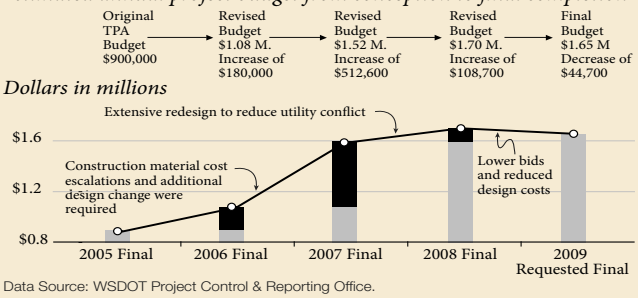
What are the project's benefits? The project was designed to improve safety by reducing collisions in a commercial zone. There were four injury collisions at this intersection in the previous two years.

What was the budget performance? This project was completed on-budget against the latest legislative expectation for $1.66 million. Escalating construction material costs, utility relocation issues, and an extensive design change to avoid even more costly right-of-way acquisition contributed to the 84% increase of $760,000 to the original appropriation of $900,000. By comparison, the Construction Cost Index increased 59.7% during this time (2005-2008).

What was the schedule performance? This project was completed on time.

SR 515/SE 182nd St to SE 176th St vicinity – Construct traffic island

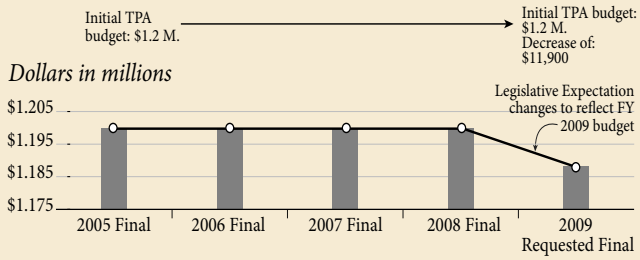
Estimated annual project budget from conception to final completion



Data Source: WSDOT Project Control & Reporting Office.

SR 410 & SR 164 Roadside safety improvements

Estimated annual project budget from conception to final completion



Data Source: WSDOT Project Control & Reporting Office.

SR 410 & SR 164 – Roadside safety improvements (King)

What did WSDOT do? Installed guardrail, removed fixed objects; and improved roadsides on both SR 410 and SR 164.

What are the project's benefits? This project was designed to improve safety by installing guardrail and making other changes to improve motorist safety and reduce the severity of collisions on these routes. Fifteen non-alcohol-related collisions in these sections have involved vehicles running off the road in the last two years.

What was the budget performance? This project had original appropriations and a 2008 budget of $1.2 million, and was completed for about $12,000 less at $1.188 million.

What was the schedule performance? This project was completed three months early in September.

Completed Project Wrap-Ups, continued

US 97/Klickitat County – Roadside safety improvements (Klickitat)

What did WSDOT do? Installed guardrail, removed fixed objects near the roadway, and flattened roadside slopes on a section of US 97 from the Columbia River to the Yakima County line.

What are the project's benefits? The stretch of US 97 has experienced a number of serious collisions. This project was designed to improve roadside safety and reduce the severity of collisions. Six of 18 non-alcohol-related collisions along this section over the last two years involved vehicles running off the road.

What was the budget performance? This project was anticipated to be completed for $800,000, - $200,000 under both the 2008 Supplemental Budget and the original appropriation in FY 2005. The cost reduction resulted primarily from aggressive bids that were $110,000 below the engineer's estimate.

What was the schedule performance? This project was completed 11 months early compared to the last legislative expectation.

Newly installed guardrail along US 97 in rural Klickitat County.

US 2 and SR 92 – Roadside safety improvements (Snohomish)

What did WSDOT do? Installed guardrail, removed fixed objects, and improved roadsides on both U.S. 2 and SR 92.

What are the project's benefits? This project installed guardrail and made other changes designed to improve motorist safety by reducing the severity of collisions on these routes. Fifteen non-alcohol related injury collisions along this corridor have involved vehicles running off the road.

What was the budget performance? This project was completed on budget, and slightly above the original FY 2005 appropriations of $1.2 million and was completed for $1.222 million. The increase funded additional design work for a related project on US 2, allowing WSDOT to increase efficiency by combining resources.

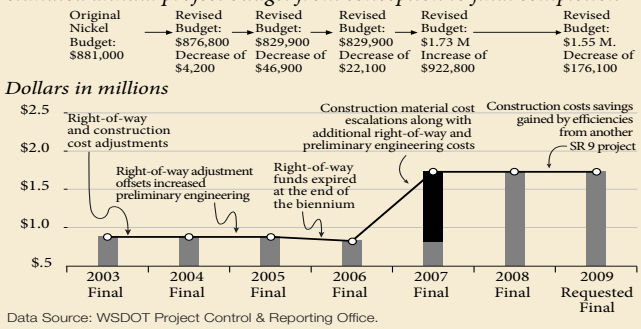
What was the schedule performance? This project was completed five months late in July due to winter snow delays and material availability problems.

Capital Project Delivery Programs

Completed Projects Wrap-Up, continued

SR 9/252nd St NE vicinity – Add turn lane

Estimated annual project budget from conception to final completion



Data Source: WSDOT Project Control & Reporting Office.

SR 9/252nd St NE vicinity (Snohomish)

What did WSDOT do? Widened SR 9 to provide a northbound left turn lane and four-foot shoulders at the 252nd Street NE intersection. In addition, this project included relocating utility poles, replacing a cross culvert, and improving illumination.

What are the project's benefits? This project improved safety by installing guardrail and improving driver visability to reduce the severity of collisions.

What was the budget performance? Higher costs for fuel, asphalt and steel, and a fish passage barrier improvement led to an increase in project costs from the original appropriation of $881,000. Construction efficiencies with another SR 9 project offset $176,100 of these costs. This project was completed under the FY 2008 budget at $1.55 million

What was the schedule performance? This project was completed one quarter early.

SR 9/Schloman Rd to 256th St NE - New alignment (Snohomish)

What did WSDOT do? Widened SR 9 to provide 12-foot lanes and four-foot shoulders, realigned two existing curves, lowered a hill, and flattened slopes. The project also installed guardrail, relocated utility poles, removed hazardous waste, and replaced a cross culvert.

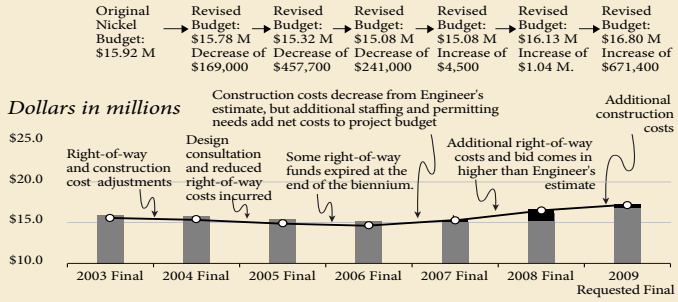
What are the project's benefits? The project is intended to reduce the number and severity of collisions on a sharply curved stretch of busy road by giving drivers better sightlines and more room to maneuver on the roadway. Added guardrail would further enhance motorist safety.

What was the budget performance? This project was completed for $16.8 million, on-budget with the last legislative expectations. By correcting a survey alignment error during the design phase of the project, WSDOT reduced initial right-of-way and construction costs. Initial cost reductions were later offset by additional design work on the road alignment, wetland mitigation, gravel expenses, and erosion control costs; which were all greater than anticipated.

What was the schedule performance? This project was completed one quarter early.

SR 9/Schloman Rd to 256th St NE – New alignment

Estimated annual project budget from conception to final completion



Data Source: WSDOT Project Control & Reporting Office.

The new alignments on SR 9 will help to reduce accidents, as will the newly installed guardrail seen above.

Completed Project Wrap-Ups, continued

SR 9/268th St intersection – Add turn lane (Snohomish)

What did WSDOT do? Constructed left turn lanes on SR 9 at the 268th Street intersection, as well as lowered a hill. The project required wetland mitigation, illumination improvements and hazardous waste removal.

What are the project's benefits? The project offers drivers better visibility and improved safety by installing guardrail, relocating utility poles, removing hazardous waste, and replacing a cross culvert.

What was the budget performance? This project was completed on budget at $2.83 million. The slight increase to the originally appropriated amount was due to additional traffic control requirements and unanticipated poor soil conditions under the existing roadway, which required building a retaining wall to protect wetland property. WSDOT conducted a Value Engineering study with a special emphasis on the site's geotechnical issues, and identified road alignment and wall design changes to keep the project within budget expectations.

What was the schedule performance? This project was completed one quarter early.

SR 902/Medical Lake Road interchange (Spokane)

What did WSDOT do? Improved the intersection of SR 902 and Medical Lake Road to better accommodate the growing traffic demand and reduce the potential for collisions. This interim solution lengthened the right turn lane and upgraded the lighting to improve safety.

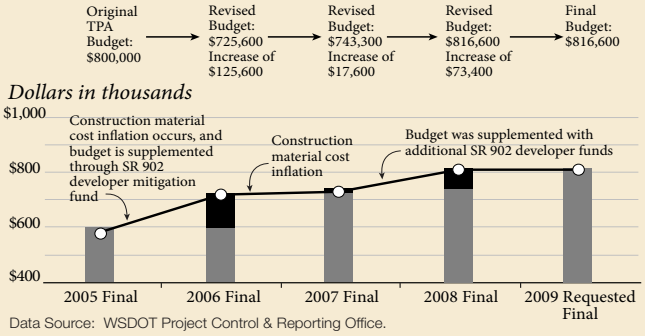
What are the project's benefits? The area around the interchange is becoming more commercialized. Intersection improvements were designed to enhance safety by reducing collisions, while planning continues for a better long-term solution.

What was the budget performance? This project was completed for $816,000, $216,000 above the original budget of $600,000 and $73,000 above the last authorized budget of $743,000. Costs increased $216,000 due to an initial underestimation of the extent of design work needed to determine the best solution, coupled with inflation. However, the project received $173,400 from the SR 902 developer mitigation fund (non-state funds) to help pay for the improvements, offsetting some of the cost increases. The project also included $66,000 for scoping of a long-term solution at this location.

What was the schedule performance? The project was completed one month early according to most recent legislative expectation.

SR 902 Medical Lake interchange improvements

Estimated annual project budget from conception to final completion



Data Source: WSDOT Project Control & Reporting Office.

The newly lengthened right turn lane on the approach to the SR 902/Medical Lake Road interchange in Spokane County.

Capital Project Delivery Programs

Completed Projects Wrap-Up, continued

SR 542/Boulder Creek Bridge – Replace bridge (Whatcom)

What did WSDOT do? Replaced the existing bridge with a taller, wider bridge designed to meet current standards and add 10-foot-wide pedestrian and bicycle path.

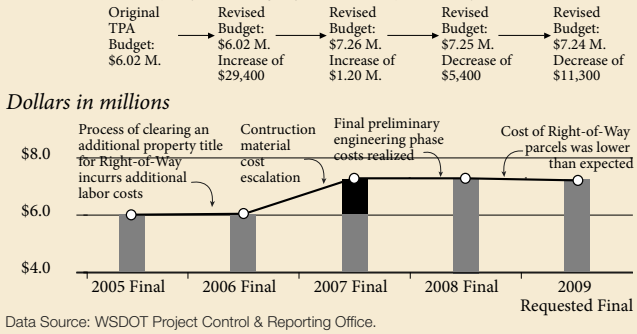
What are the project's benefits? The project was designed to address flooding and resulting highway closures, reduce maintenance, improve fish habitat and improve safety for pedestrians.

What was the budget performance? This project was on budget with the last authorized budget amount of $7.247 million. Construction material cost escalation for steel, concrete and petroleum resulted in a $1.2 million increase above the original appropriated amount in 2005. Final construction costs are currently expected to be $860,000 below the last legislative expectations, largely due to lower than expected bids.

What was the schedule performance? This project was completed three quarters early due to aggressive scheduling.

SR 542 Boulder Creek Bridge replacement

Estimated annual project budget from conception to final completion



Data Source: WSDOT Project Control & Reporting Office.

The newly constructed Boulder Creek Bridge meets current bridge standards and provides improved pedestrian and bicycle access.

SR 410 along the Naches River. Increased flows from snow melt and winter weather promoted erosion along the river bank, affecting the highway in years past.

SR 410 Rattlesnake Creek (Yakima)

What did WSDOT do? Stabilized slopes in an area where the SR 410 roadbed has been repeatedly threatened by erosion at the confluence of the Naches River and Rattlesnake Creek, west of Naches.

What are the project's benefits? This project was designed to protect the roadbed from further erosion, safeguarding the highway.

What was the budget performance? This project was completed on budget with last legislative expectations at a cost of $331,700. Rising construction material costs and the need for specialized materials caused the $81,700 cost increase above the original appropriated amount of $250,000.

What was the schedule performance? This project delivered on-time based on last legislative expectations, after an earlier delay to combine work with another project.

WSDOT's Capital Project Delivery Programs

Project Spotlight: I-405 Congestion Relief Project

The I-405 Mega-Project is expanding one of the state's busiest highway sections to relieve congestion and improve safety. The $1.5 billion effort, funded by the 2003 Nickel and 2005 TPA funding packages, includes 10 projects designed to widen the roadway, improve merge conditions, enhance wetlands and wildlife habitat, reduce noise pollution and better treat stormwater run-off.

WSDOT estimates 44% of the mega-project will be complete by the end of the 2007-2009 biennium. The corridor team has completed two projects and begun construction on four others. Each of the currently funded projects has been advertised early; they are on budget and ahead of schedule.

The first project, Kirkland Stage 1, added a lane in each direction between 85th Street and NE 124th Street in Kirkland when it was completed one year ahead of schedule in 2007. Currently, the corridor team is constructing an additional lane in both directions between I-90 and SE 8th Street to add capacity and reduce congestion.

Demolishing a tunnel, expanding I-405

In August, crews completed a high profile and challenging element of the South Bellevue Widening Project by demolishing the Wilburton Tunnel. A coordinated communications effort and intense media coverage helped reduce traffic by as much as 60%, keeping detour routes manageable and traffic back-ups minimal. The cooperation helped keep people informed about the construction closures, the potential traffic impacts and the steps WSDOT was taking to keep vehicles moving. Crews were able to finish the demolition one week early, saving two months of night work.

The Renton Stage 1 Widening project also benefited from the closure, shifting southbound I-405 traffic onto the newly constructed portion of the Oakesdale Bridge to allow construction crews to accelerate work along the freeway.

The two widening projects, expected to improve safety and capacity on the daily congested trips between Tukwila and Bellevue, are on target for completion in December 2009.

Ribbon cuttings are also planned in 2009 for the NE 10th Street Bridge project and Springbrook Creek Wetland and Habitat Mitigation Bank. Two other projects, the Renton Stage 2 Widening Project and NE 8th Street to SR 520 Improvement project, are scheduled to break ground next year.

Other projects under way

- Springbrook Creek Wetland and Habitat Mitigation Bank, completion expected 2009.
- NE 10th Street Bridge crossing stage 2, completion expected 2009.
- NE 132nd Street Interchange, completion expected 2015.
- NE 8th Street to SR 520 Northbound braided crossing project, completion expected 2012.
- Renton Stage 2 widening, completion expected 2011.

I-405 Project Highlights

- Advertised early for all currently-funded projects. All projects are currently on budget and ahead of schedule.
- Two of 10 projects completed, four others under construction.
- Approximately 30% of the overall project is complete, at a cost of $430 million to date, and is on budget according to most recent Legislative expectations.
- Right-of-way effort relocated nearly 150 residents and businesses at cost of over $100 million.

The Wilburton Tunnel was removed in two weekends of around-the-clock work, allowing I-405 to avoid a third weekend of closures.

Special Report: Tacoma/Pierce County HOV Program Quarterly Update

The Tacoma/Pierce County HOV Program is a series of safety and congestion improvement projects that add HOV lanes and other upgrades to I-5, SR 16, and SR 167. Currently, seven projects have been completed with six on-time and five on-budget (see table). Seven more projects are in the design phase, with one, the Westbound Nalley Valley project, to begin construction in early 2009.

Completed projects, Tacoma/Pierce Co. HOV Program

Project name	On-time	On-budget
I-5: 38th St. Interchange	✓	✓
SR 16: Sprague Ave. Interchange to Snake Lake	✓	Over
SR 16: Pearl St. to Jackson Ave.	✓	✓
SR 16: 36th St. Interchange to Olympic Dr.	✓	✓
SR 16: Union to Jackson Ave.	*	*
I-5: South 48th St. to Pacific	✓	✓
SR 16: Jackson to 36th St. Interchange	✓	✓

Data Source: HOV Program Office.

*While operationally complete, construction continues for this project; more will be reported when the project is fully completed.

I-5/SR 16: Westbound Nalley Valley next on project list

On July 7, the I-5/SR 16: Westbound Nalley Valley project was advertised for bids. Bid opening is scheduled for October 1. Once awarded, the project will begin in early January 2009 and take about three years to construct. As the fifth of seven projects to rebuild and expand the Nalley Valley Viaduct, its new structures will connect to improved and realigned I-5 and SR 16 roadway structures built earlier in the Tacoma/Pierce County HOV program.

When it opened in 1971, the existing viaduct was built on unique structures called tetrapods. Although tetrapods have served the viaduct's users well, their unusual geometry makes widening the structure unfeasible. WSDOT will instead build a new viaduct, demolishing the old over the next several years.

The computer-enhanced photo to the lower right shows how the area will look once a new westbound viaduct and associated ramps are built. An immediate benefit of the new structure will eliminate the "weave" that now occurs between traffic continuing on westbound SR 16 and traffic exiting to South Sprague Avenue. Eliminating this high-accident-location will increase safety and reduce traffic congestion.

Project benefits and elements

The I-5/SR 16: Westbound Nalley Valley project will:

- Eliminate the current traffic weave created by merging traffic
- Increase capacity in the westbound direction
- Increase motorist safety
- Build new westbound bridge structures adjacent to the existing viaduct
- Widen shoulders
- Improve lighting
- Improve stormwater treatment
- Add electronic traffic signs, traffic data collectors, and other devices to monitor and provide traffic information
- Restore wetlands

Project Highlights

- Seven of 14 funded projects have been completed.
- Six projects have been completed on-time and five on-budget.
- The Westbound Nalley Valley Viaduct is set to go under construction in early 2009.
- For more information, see www.tacomatraffic.com.

Current SR 16 Nalley Valley Viaduct.

Rendering of new interchange.

Special Report: SR 104 Hood Canal Bridge east-half replacement and west-half retrofit

Overall project completion reaches 85%

As of September 30, the SR 104 Hood Canal Bridge project was 85% complete. Important milestones accomplished this quarter include completing pontoon construction and connecting the final pontoons.

Other milestones completed

Pontoon construction is now 100% complete. The project team successfully coordinated the final float-out of the east-half's new pontoons from Concrete Technology Corporation (CTC) in Tacoma on August 1. This milestone achievement ended all pontoon work at CTC, where more than 29,000 yards of concrete were placed and 14 new bridge pontoons have been constructed since 2006.

As of September 19, when the project's newest pontoons were connected to the other pontoons, assembly, outfitting, and testing were 73% complete. The pontoons—which are a combined 925 feet long—are currently being outfitted with crossbeams, girders, and roadway. The four-pontoon section will comprise the easternmost portion on the bridge when replacement work is completed in June 2009.

Material fabrication is now 97% complete. Work is progressing steadily at Oregon Iron Works (OIW) in Vancouver, WA, where the second of two trusses is on schedule for its February 2009 transport date. Crews at OIW continued work on the east truss as well as the east and west A-frame structures, which will be used to connect the trusses to the pontoons.

Ninety-five percent of the west-half leak detection system is complete. WSDOT and the contractor, Kiewit-General (K-G), continue to install the electrical components that will alert crews if water leaks inside the 19 west-half pontoons. WSDOT was unable to work on the system during bad winter weather, but crews are now on track to complete the work in October 2008. The system is operational and only punch-list items remain.

Final preparations for east-half installation

WSDOT and K-G are on schedule to complete outfitting work on the new draw span and roadway pontoons by January 2009. The two trusses will be completed and towed into Port Gamble Bay, near the Hood Canal Bridge site, by March. By April, all new pontoons will be prepped and ready to be moved to the bridge site, setting the stage for the six-week closure of the bridge in May-June 2009 when the east-half is installed.

Financial overview

The Hood Canal Bridge project, budgeted at $470 million, includes widening and retrofitting the west-half, replacing the east and west approach spans, replacing the Hood Canal Bridge eastern floating portion, and replacing the east and west transition spans. There is a $29 million cost increase on the total project estimate due to factors including higher priced fuel and materials, extended materials storage, and problems associated with constructing bridge components at confined and congested sites. Spending for the remainder of the current biennium is projected to exceed the 2008 legislatively approved budget by $36 million. Pending approval by the Office of Financial Management, WSDOT plans to cover this overage with available federal funds.

Project Highlights

- As of September 30, the Hood Canal Bridge replacement project was 85% complete.
- Pontoon construction is now 100% complete, with the last float out occurring on August 1.
- On September 19, assembly work was completed when the last pontoons were connected.
- The May-June 2009 six-week closure of the bridge is still on schedule.
- For more information on this project, visit www.hoodcanalbridge.com

On August 1, the final two pontoons were floated out of the graving dock.

WSDOT's Capital Project Delivery Programs

Watch List: Projects with schedule and budget concerns

WSDOT is committed to frequent and accurate "no surprises" reporting of project performance, emphasizing rigorous analysis while communicating in plain language, unencumbered by jargon or insider terminology. As part of that commitment, WSDOT regularly addresses issues that do, or potentially could, affect a project's schedule and budget: they are outlined here in the Watch List. When these issues are resolved, which may take more than one quarter, the project is removed from the Watch List. If new issues arise, an update to the project will be provided in the Update to Watch List section.

The gray box below describes some of the common problems that may affect the successful progress of a project from design through completion; they are listed in the order in which WSDOT might face them, starting in the earliest planning stages and concluding with actual construction.

The summary on pages 116-117 lists projects currently facing schedule or budget concerns with a reference to these overarching descriptions; a more detailed description of the precise problem or its resolution appears on the following pages. Still more information is presented on the individual project pages on the WSDOT website at www.wsdot.wa.gov/projects. Projects paid for through Pre-Existing Funds are discussed on page 100.

It is important to note that while the number of projects appearing on the Watch List has grown over time, so have the number of projects under way (we report on the project whether it is under construction or in planning and design phases). By tracking problem projects more closely on the Watch List, WSDOT can keep all its stakeholders informed while evaluating possible solutions.

Environmental

Archeological: Unexpected finds may require additional time for careful excavation.

Reviews & approvals: Completing state and federally required environmental studies may take longer than anticipated, may reveal unexpected problems with the project location, or prompt the involvement of community or other agencies.

Fish passage barrier: Many factors must be taken into account to design and construct 'best practice' water conduits, including negotiating with resource agencies and tribes to develop appropriate designs to ensure fish can pass through.

Geological: Studies may reveal unsuitable soil conditions for construction on the proposed route.

Mitigation: Minimizing harm to wetlands and other natural features may involve many other factors from design through construction.

Permitting: New information about a project site or changes in design can lead to the reworking of permits, causing delay or additional expense.

Coordination

Local concerns: Concerns raised by local communities may require additional design work which if not resolved might result in litigation expenses.

Inter-agency issues: Project may require more collaboration with local jurisdictions, or may require inter-local agreements, such as Memoranda of Understanding (MOUs) or Memoranda of Agreement (MOAs).

Tribal government issues: Consultation with tribes as required by Centennial Accord and specific treaties. Where treaty rights are affected, there may be financial settlements unanticipated in the original project budget.

Design

Alternatives: Design alternatives may require unanticipated revision as the result of environmental analyses and/or public input.

Design disputes: Communities or other entities may challenge design concepts, requiring additional time spent in design.

Design element changes: Project parameters may change, requiring changes to designs in progress or under construction.

Team turnover: Changes in staff may delay progress as new team members are brought up to speed on the project.

Utilities

Agreements with other jurisdictions: Agreements may take longer to obtain than anticipated.

Utility relocations: Moving power, water, gas, or other utility lines may be more complex than originally expected.

Right-of-Way

Design changes: Project revisions that may require additional land.

Land acquisition: Negotiations with landowners regarding purchase of property may take longer than anticipated.

Land appreciation: Property value increases that exceed projections.

Land use designation changes: Land previously zoned as farmland may have been converted to industrial or commercial use, raising the purchase price.

Construction

Contractor issues: Disputes with contractors or disagreements over contract parameters may delay construction at any point in the job.

Cost increase of materials: Unit costs may increase beyond the set budget due to fluctuations in the marketplace or a failure to estimate costs properly at the design phase.

Materials procurement: Unexpected demand or lack of availability of raw materials required for construction.

Timing problems: Delays at design or right of way may mean work schedules conflict with events such as fish spawning season.

Weather: Weather unsuitable for construction work will temporarily halt the project.

Litigation

At any point, a problem may escalate if one or more of the parties decides to file a lawsuit.

Watch List: Projects with schedule and budget concerns

Watch List Summary

Projects with budget and/or schedule concerns

Added to Watch List	Project type	Watch List Issue
SR 285 / West End of George Sellar Bridge – Intersection improvement (Chelan)	Highway	Design
I-90 / I-5 to 12th Avenue South – Seismic retrofit (King)	Highway	Construction: cost increase of materials
SR 522 / University of Washington Bothell – Build interchange (King)	Highway	Construction
I-405 / NE 8th Street to SR 520 Braided Ramps – Interchange improvements (King)	Highway	Design: cost increase of materials
SR 167 / 15th Street SW to 15th Street NW – Add HOV lanes (King)	Highway	Construction: weather, contractor issues
I-5 / Rush Road to 13th Street – Add lanes (Lewis)	Highway	Construction: cost increase of materials, archaeological, geological
SR 3 / Belfair Area – Widening and safety improvements (Mason)	Highway	Design: design element changes
SR 9 / 212th Street SE to 176th Street SE, Stage 3 – Add lanes (Snohomish)	Highway	Environmental: mitigation; Design: design element changes
SR 9 / SR 528 – Improve intersection (Snohomish)	Highway	Coordination
I-5 / Grand Mound to Maytown Stage One – Add lanes (Thurston)	Highway	Construction: cost increase of materials
Updates to Watch List	**Project type**	**Watch List Issue**
SR 14/Camas Washougal – Add lanes and build interchange (Clark)	Highway	Environmental: geological, permitting
SR 285/George Sellar Bridge – Additional eastbound lane (Douglas)	Highway	Construction: cost increase of materials
SR 99/Aurora Avenue George Washington Memorial Bridge – Seismic retrofit (King)	Highway	Environmental: geological; Construction
SR 532/Corridor improvements – Design-build contracts (Island, Snohomish) Individual projects under this umbrella project name: • SR 532/270th Street NW to 72nd Avenue NW – Improve safety • SR 532/Sunrise Boulevard to Davis Slough – Improve safety • SR 532/General Mark W. Clark Memorial Bridge – Improve safety • SR 532/64th Avenue NW to 12th Avenue NW – Improve safety • SR 532/Pilchuck Creek Tributary – Fish barrier • SR 532/General Mark W. Clark Memorial Bridge – Replace bridge	Highway	Environmental: permitting: Right-of-way: land acquisition; Design: design element changes
SR 410 White River – Stabilize slopes (Pierce)	Highway	Design: alternatives
SR 167/8th Street East vicinity to South 277th Street vicinity – Southbound managed lane (King, Pierce)	Highway	Design: design element changes
I-405/SR 181 Stage 1 – Widening (King)	Highway	Right-of-way: land acquisition; Construction
I-405/SR 520 to SR 527– Widening Stage 2 (King)	Highway	Design: alternatives
I-5, Mellen to Grand Mound – Widening, interchange reconstruction (Lewis, Thurston)	Highway	Design: alternatives
SR 410 / 214th Avenue E to 234th – Add lanes (Pierce)	Highway	Environmental: archaeological; permitting
SR 522/Snohomish River Bridge to US 2 – Add lanes (Snohomish)	Highway	Design: alternatives
SR 529/Ebey Slough Bridge – Replace bridge (Snohomish)	Highway	Environmental: geological, mitigation
US 12/ SR 124 Intersection – Build interchange (Walla Walla)	Highway	Right-of-way: land acquisition

WSDOT's Capital Project Delivery Programs

Watch List: Projects with schedule and budget concerns

Watch List Summary

Projects with budget and/or schedule concerns

Updates to Watch List, continued	Project type	Watch List Issue/Resolution
US 12/Tieton River East and West Bridges – Replace bridges (Yakima)	Highway	Environmental: reviews & approvals
Eagle Harbor Maintenance Facility (Kitsap)	Ferries	Design: alternatives (legal issue)
Port Townsend-Keystone Vessel Replacement Project (Island)	Ferries	Design: alternatives
New 144-Auto Ferries (King, Kitsap, San Juan)	Ferries	Design
Mukilteo Multimodel Ferry Terminal (Snohomish)	Ferries	Design
Vancouver – Rail Bypass and West 39th Street Bridge (Clark)	Rail	Right-of-way: land acquisition
Tacoma – Bypass of Pt. Defiance (Pierce)	Rail	Right-of-way: land acquisition; Design: re-design
Mount Vernon – Siding improvements (Skagit)	Rail	Design: alternatives
Everett – Curve realignment and storage tracks (Snohomish)	Rail	Environmental: mitigation
Stanwood – New station; Siding upgrade (Snohomish)	Rail	Environmental: permitting
Removed from Watch List	**Project type**	**Watch List Issue/Resolution**
US 101 Dawley Road vicinity to Blyn Highway (Clallam)	Highway	Environmental: permitting; Right-of-way: land acquisition, waiting for Congressional approval
I-5, Talley Way interchange (Cowlitz)	Highway	Design: design element changes; Environmental: review and approval
I-405, I-5 to SR 169 Stage 2 – Widening and SR 515 interchange (King)	Highway	Right-of-way: land acquisition
SR 104/Hood Canal Bridge – Replace east half (Kitsap)	Highway	Construction: cost increase of materials, Design: design element changes
SR 305/Hostmark to Bond (Kitsap)	Highway	Environment
SR 9/Schloman Road to 256th Street NE – Add new alignment (Pierce) SR 9/252 Street NE Vicinity – Add turn lane; SR9/268th Street Intersection – Add turn lane (Snohomish)	Highway	Construction: materials procurement; Environmental:
I-5/172nd Street NE (SR 531) Interchange – Rebuild interchange (Snohomish)	Highway	Right-of-way: land acquisition
SR 542/Nooksack River – Redirect river and realign roadway (Whatcom)	Highway	Environmental: geological; Right-of-way: land acquisition
Bellingham – Waterfront restoration, Bellingham – GP area upgrades (Whatcom)	Rail	Environmental: archaeological

Watch List: Projects with schedule and budget concerns

Added to Watch List

SR 285/W End of George Sellar Bridge - Intersection improvements (Chelan)

This project, one of three involving the George Sellar Bridge, is budgeted for $16.2 million. It will modify the intersection of SR 285 and Mission Street, a major bottleneck to traffic at the west end of the bridge. The project will increase traffic flow through the intersection, reducing travel time and congestion-related collisions.

The project is in the design phase; its budget and schedule are at risk. A combined Cost Risk Assessment/Value Engineering (VE) workshop was held in July; it identified rising costs for materials and right-of-way acquisition due to possible condemnation proceedings. This resulted in a project forecast of $18.5 million, which is $2.3 million above the 2008 Supplemental Budget allocation.

However, the VE study also identified potential savings by building the project in one construction season rather than two, as originally planned; the current plan reflects that recommendation.

To match available TPA funding, the advertisement date will be delayed from October 2010 to October 2011, and the operationally complete date from November 2011 to June 2013.

The cost increase and a schedule adjustment will be included for consideration in the 2009-11 budget process. An update will be provided as information becomes available.

Related projects
SR 28/E End of George Sellar Bridge - Construct bypass
SR 285/W End of George Sellar Bridge - Intersection improvements

I-90/I-5 to 12th Ave S - Seismic retrofit (King)

This project, budgeted for $10.4 million, will conduct seismic retrofits on three existing bridges on I-90 in the I-5 interchange area. The improvements will reduce the probability of catastrophic damage from an earthquake.

This project has completed the design phase; its budget is at risk. The $13.4 million current construction estimate exceeds the 2008 Legislative budget by $4 million. This increase is due to higher material costs on construction materials such as steel-column jacketing, steel reinforcing, cement concrete, and grout. In addition, there are cost increases in biohazard removal, erosion control, traffic control, and contract administration. Labor costs are also expected to be higher than previously estimated because the work is located in confined areas difficult to access and can only be accomplished at night to minimize traffic impacts.

The project's schedule is also at risk. Although it is on schedule to be advertised in October 2008, the work area and time constraints will extend the work into two construction seasons. This will delay the operationally complete date from June 2009 to June 2010.

I-405/NE 8th St to SR 520 – Improvement project: Braided ramps (King)

This project, budgeted for $255 million, will construct on- and off-ramps on I-405 northbound to relieve traffic weaving and congestion in the vicinity of downtown Bellevue and the I-405/SR 520 interchange. When completed, the project will improve safety by reducing congestion and improving vertical clearance at the NE 12th Street overcrossing.

The project is in the design phase; its budget has experienced a $22 million cost increase due to more expensive designs for retaining walls and structures to meet new national seismic design criteria. Other causes include the larger stormwater detention facilities associated with right-of-way acquisition, and higher inflation projections based on a new, national construction cost index.

WSDOT is currently considering recommendations and modifications proposed after a recent in-depth design assessment and Value Engineering study to keep construction within budget.

The project is scheduled for advertisement in March 2009. An update will be provided as information becomes available.

SR 167/15th St SW to 15th St NW - Add HOV Lanes (King)

This project, budgeted for $41.5 million, built substantial improvements to SR 167, a four-lane highway between Auburn and Renton in King County. Improvements included high occupancy vehicle (HOV) lanes, an Intelligent Transportation System (ITS), and HOV ramps. Improvements will relieve congestion, increase capacity, and provide a travel time advantage to transit and HOV traffic.

Though the project became operationally complete in October 2008, it still requires striping, other cosmetic work, and has experienced an $821,000 construction increase due to weather-related costs. As part of the planned winter shutdown, ramp work was delayed until the 2008 construction season. However, heavy winter rains resulted in intensified deterioration of the ramps, calling for unexpected repairs and rework. WSDOT has submitted a request to the Office of Financial Management (OFM) to proceed with this increase to the project's budget.

An additional cost risk has developed based on a request from the contractor for compensation related to the delays; WSDOT has asked the contractor to provide information to

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substantiate the request. An update will be provided as information becomes available.

SR 522/University of Washington Bothell - Build interchange (King)

This project, budgeted for $47.1 million, constructs a new interchange on SR 522 to provide access to the new University of Washington Bothell/Cascadia Community College joint campus. The project improves motorist safety and addresses increased traffic volumes. The work includes a new signalized intersection at Woodinville Drive at Brackett's Landing, a new bridge over this intersection, and a wider southbound I-405 off-ramp to westbound SR 522 to provide two lanes.

The project's budget is at risk. Construction began in early April 2008. Since then, the contractor has mobilized a larger crew to work on the project, and sequenced work differently from what WSDOT anticipated during design. The contractor has accomplished more work ahead of schedule, which requires WSDOT to make higher payments to the contractor within this biennium. As a result, the expenditure plan has been updated and is now $11.6 million higher than the original 2007-09 biennial budget. The expenditure plan for 2009-11 has been reduced to reflect the work being advanced into the current biennium. WSDOT will request approval from OFM to proceed with increases to the 2007-09 biennial construction budget for this project.

Based on current progress, the project is expected to be operationally complete in October 2009, eight months ahead of schedule.

I-5/Rush Road to 13th Street – Add lanes (Lewis)

This project, budgeted for $51 million, will improve a 3.7 mile section of I-5 from Rush Road to 13th Street in Lewis County, by constructing an additional lane in each direction and a new interchange at LaBree Road. This will reduce congestion and improve traffic flow.

The project was advertised for construction on-time, in March 2007, and is on-schedule to be completed in December 2009. Current budget forecasts predict a shortfall of $2 million due to asphalt and oil price cost escalation, archaeological investigation and monitoring, erosion control, additional traffic control, and added work due to poor soil conditions.

WSDOT is evaluating the remaining items on the project for ways to minimize the need for additional funds. An update will be reported as more information becomes available.

SR3/Belfair area – Widening, safety improvements (Mason)

In 2005, $18.6 million was appropriated for this project intended to relieve congestion and enhance safety on a busy stretch of SR 3 between Romance Hill Road and SR 106. Other work includes pedestrian and bicycle facilities, and storm water management improvements concerning the nearby Hood Canal.

WSDOT conducted a cost-risk assessment in July 2008 and determined that the estimate to complete the project, as originally defined, is now $25.4 million. This is due to updated estimates for engineering, high market prices for construction materials, and a $3.5 million right-of-way phase not in the original proposal.

As an alternative, WSDOT is proposing a down-sized project that would complete all two-way left-turn lane construction as described in the original scope; it is closer to the available budget amount. The project length would be reduced from 2.2 miles to 1.4 miles by deferring the pedestrian/bicycle work between NE Belfair Street and NE Ridgepoint Boulevard. The advertisement date will be delayed from November 2010 to July 2012, with construction in the 2011-2013 biennium.

The revised project description, including a necessary right-of-way phase did not get included in the 2009 agency request budget which included $22 million for the project. However, that amount is sufficient for the down-sized project. A second unfunded project will be defined with the deferred pedestrian/bicycle work. These changes will need to be addressed as the budget process progresses.

SR 9/212th St SE to 176th St SE, Stage 3 - Add lanes (Snohomish)

This project, budgeted for $81.6 million, will widen SR 9 from two lanes to four lanes, including a raised median. Sidewalks will be constructed at selected locations to reduce congestion and improve safety.

The project is in the design phase; its budget is at risk. An in-depth Cost Risk Assessment, conducted in May 2008, indicated that the project cost may increase to $106.6 million. In August 2008, an extensive engineering evaluation identified potential cost savings between $15 and $18 million.

In order to bring the project cost within budget, WSDOT has begun to implement many of the engineering evaluation recommendations, such as designing fill slopes to eliminate retaining walls, repaving (instead of reconstructing) the existing two lanes on SR 9, consolidating stormwater ponds, and changing certain side street improvements that will not affect traffic flow or intersection operations. In addition, WSDOT will work with Snohomish County to find innovative methods

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to address wetland mitigation. After making these changes, the project cost estimate is now at $85.8 million, or $4.2 million over budget now primarily due to escalating construction material and fuel costs.

The project schedule is also at risk. Advertisement may be delayed up to two months from November 2010 to January 2011 because of ongoing challenges in finding suitable mitigation for the project's wetland impacts, and acquiring right-of-way needed for utility relocations.

SR 9/SR 528 – Improve intersection (Snohomish)

This project, budgeted for $17.1 million, will build left-turn and right-turn lanes on SR 9 and SR 528 as needed, and upgrade the traffic signal and illumination. Intersection improvements will affect drainage, stormwater, and environmental impacts.

This project is in the planning phase, but the schedule is at risk as WSDOT waits on a decision from a large retail chain to construct their commercial development on the northwest corner of this intersection. To offset traffic impacts generated by this new development, the retailer is planning to pay for intersection improvements, eliminating the need for WSDOT's project. However, the retailer has delayed their project twice, most recently to 2010, and it remains uncertain if WSDOT's project will be needed.

WSDOT has delayed its design start to February 2009 and proposes a further delay to spring 2010. Updates will be provided as information becomes available.

I-5/Grand Mound to Maytown Stage 1 – Add lanes (Thurston)

This project, budgeted at $95 million, constructs one additional northbound lane and one southbound lane from south of the interchange with U.S. 12 at Grand Mound to the interchange at Maytown. Work will include replacing several bridges and extending both on- and off-ramps for improved safety, to relieve congestion and reduce the risks of collisions.

The project budget for 2007-09 is at risk. Rising fuel and asphalt prices since bid opening are estimated to raise the project's total cost by $4-$5 million—from $87.4 million to $92 million, resulting in increased expenditures over the life of the contract for this biennium and next.

Increased expenditures of $5-$6 million in the current biennium are due to the contractor's aggressive schedule: the contractor is spending more than budgeted in the current biennium. To offset the accelerated expenditures on this project, adjustments have been made to limit Nickel expenditures on another project in 2007-09 (I-5/SR 16 Westbound Nalley Valley I/C).

Updates to Watch List

SR 14/Camas Washougal – Add lanes and build interchange (Clark)

This project, budgeted for $57 million, will improve safety and congestion on SR 14 from 6th Avenue to east of Union Street. Still in the design phase, the project design has been revised to keep safety improvements and stay within budget.

As reported in the June 2008 *Gray Notebook*, the discovery of seismic retrofit and soil liquefaction issues at the bridge locations could increase the project's cost by $10 million. In September, WSDOT decided to modify the design to stay within the $57 million budget while still providing all the intended safety requirements and 20 years of future mobility needs.

Modifications include adding a median barrier to West Camas Slough Bridge; starting the SR 14 four-lane widening on Lady Island rather than on the West Camas Slough Bridge; and building a new bridge over the East Camas Slough. Redesigning the interchanges at Union and Second Avenue (to a split diamond format) will reduce project costs, require less construction, and simplify traffic patterns.

The schedule was at risk due to additional design time, as well as environmental documentation requirements and permitting timelines. WSDOT has met with the permitting agencies to try to resolve documentation requirements. Additionally, the timeline to complete agreements with the Bonneville Power Administration may still delay the advertisement date of the project, currently scheduled for January 2010.

The schedule and scope changes will be presented to the Office of Financial Management (OFM) as part of the legislative approval process. Updates will be reported as information becomes available.

SR 285/George Sellar Bridge – Additional eastbound lane (Douglas)

This project, budgeted for $13.5 million, will provide an additional eastbound lane to ease heavy congestion at both ends of the George Sellar Bridge. It is the first of three contiguous major contracts, with the schedules of the other two dependent on this one, and is in the design phase. The other two major contracts are:

SR 28/E End of George Sellar Bridge - Construct bypass (Douglas)
SR 285/W End of George Sellar Bridge - Intersection improvements (Chelan)

The estimated preliminary engineering cost has increased due to a more extensive and detailed bridge design than originally anticipated. The estimated construction cost has increased due to the need to strengthen more truss members than originally

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expected, the rising cost of steel, and inflation. These factors have increased the cost to $15.8 million.

Consequently, the advertisement date will be delayed one month to January 2009, and the operationally complete date will be delayed from December 2010 to June 2011. The delays allow time to address additional bridge analysis, design, detailing requirements, and to purchase railroad easements.

The cost increase and the schedule adjustment will be included for consideration in the 2009-11 budget process. An update will be provided as information becomes available.

SR 99/Aurora Ave-George Washington Memorial Bridge – Seismic (King)

This project, budgeted for $5.6 million, completes the remaining seismic retrofit work on the George Washington Memorial Bridge to reduce the probability of catastrophic damage from an earthquake. It is still in the design phase.

The additional testing of a new type of polymer fiber technology to stabilize the bridge, as discussed in the June 2008 *Gray Notebook*, has been delayed. Hiring contractors to construct, conduct, and evaluate the testing has taken longer than expected. Testing is scheduled to begin in October 2008, with findings expected by May 2009. This longer evaluation period may impact the project schedule and the planned October 2009 advertisement date.

Since testing costs have not been finalized, there may also be additional design costs. An update will be provided when more information becomes available.

SR 410/White River – Stablize slopes (King)

This project, budgeted for $16.8 million, will correct erosion problems that cause the White River to flood SR 410 and damage the roadbed. The project will also reduce the risk of future wash-outs.

This project's budget continues to be at risk. WSDOT decided to proceed with the original design proposal which would raise a section of SR 410 in its current location and place engineered log jams to redirect the river flow. The additional work required—to evaluate the different design options and the completion of an independent review by a consultant of WSDOT's river modeling analysis—has increased the design expenditures by $600,000 in the 2007-2009 biennium. To stay within the $16.8 million budget, WSDOT is using in-house staff to minimize design costs on the remaining design work.

The project is currently on schedule for an April 2009 advertisement, though there are potential delays in obtaining floodplain easements from adjacent property owners and acquiring project permits. Updates will be provided as information becomes available.

SR 167/8th Street East vicinity to South 277th Street vicinity (King and Pierce)

This project, budgeted for $80 million, will construct a southbound high occupancy vehicle (HOV) lane from where it currently ends in the vicinity of Auburn to Pierce County, construct an auxiliary lane, and install ramp meters and signals. Depending on the results of the SR 167 High Occupancy Toll (HOT) pilot project, this new HOV lane may be converted to a HOT lane for additional roadway efficiency.

Since last quarter, the project has been re-evaluated: inflation of construction materials costs has added $3.5 million to the new estimate. The $3.5 million inflation increase and the change from an HOV lane to a HOT lane will be requested in the 2009 Legislative budget process. WSDOT does not anticipate any changes to the schedule established by the 2008 Legislature.

I-405/SR 181 to SR 167 – Widening (Stage 1) (King)

Related Projects:
I-405/I-5 to SR 181 - Widening (King)
SR 167/S 180th St to I-405 - SB Widening (King)

This project, budgeted for $180 million, will construct one lane on I-405 in both directions from I-5 to SR 167, add one southbound lane on SR 167 from I-405 to SW 41st Street, and extend the southbound SR 167 High Occupancy Vehicle Lane (HOV) to I-405. This project includes construction elements from several different projects, which when completed, will relieve congestion and increase safety by reducing traffic weaves.

The project's budget was at risk due to right-of-way cost increases. The Office of Financial Management (OFM) has approved proceeding with a $2 million increase for the settlement of two right-of-way parcels. A third parcel was recently settled.

However, an additional cost risk has developed as a result of the contractor's aggressive construction schedule. As it now stands, the majority of construction work will be completed in spring 2009, one year earlier than originally planned. This means that $13.5 million budgeted to be spent in the 2010 construction season will actually be spent in the 2007-09 biennium. WSDOT will submit a request to OFM for approval to increase the 2007-2009 biennial budget by $13.5 million to cover the accelerated cash flow.

Weather permitting, the contractor intends to pursue the intensive schedule and may require additional funds in 2007-09. WSDOT will monitor the contractor's schedule and update as information becomes available.

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I-405/SR 520 to SR 527 – Widening, Kirkland Stage 2 (King)

The project, budgeted for $344.8 million, will add a lane on I-405 in both directions from SR 520 to SR 522 with the exception of NE 85th Street to NE 124th Street, and add a northbound lane from NE 195th Street to SR 527. As part of this project, the bridges at NE 132nd Street require extensive improvement to accommodate new future ramps. When complete, the work will reduce congestion.

This project is in the design phase; it's scheduled for advertisement in September 2009. The budget is at risk. Since last quarter, WSDOT has re-evaluated the project costs and available budget. The project is currently estimated to be $400,000 over the 2007-09 budget and $26.5 million over the total budget. Among the elements raising cost estimates are higher construction costs for retaining walls, higher-than-anticipated construction inflation costs based on the latest national construction cost index, and design revisions required to meet the new national seismic design criteria, such as to address unstable subsurface soil conditions at the NE 132nd Street bridge site.

WSDOT continues to evaluate design modifications, and will conduct an in-depth design assessment to reduce construction costs and bring the total project cost within budget. An update will be provided as information becomes available.

Related projects:
I-405/NE 124th St to SR 522 - NB Widening (King)
I-405/NE 132nd St - Bridge Replacement (King)
I-405/NE 195th St to SR 527 - NB Widening (King)

I-5 Mellen Street to Grand Mound – Additional Lanes (Lewis, Thurston)

This project, budgeted for $197 million, will improve safety and traffic flow by adding lanes and reconstructing interchanges on I-5. The project will be delivered in three stages.

The Blakeslee Junction to Grand Mound stage has completed 90% of the design work, and is in the process of a constructability review; negotiations for right-of-way are also underway. This section of the project will widen four miles of I-5 from two lanes to three general purpose lanes in each direction.

The start of construction for this stage will be moved from summer 2009 to spring 2010. Doing so eliminates a construction overlap with the ongoing 'I-5/Grand Mound to Maytown Widening' project at the north end of this project, and allows time for negotiations and property acquisitions with railroads, Tribes, and private parties. Advertising earlier will allow more work to be completed in the first construction season; the overall completion date remains unchanged and will not affect other I-5 corridor project timing.

The proposed design changes, as discussed in the June 30 *Gray Notebook*, will be addressed in the 2009 legislative budget.

Related Projects:
I-5/Blakeslee Junction Railroad Crossing to Grand Mound I/C – Add Lanes (Lewis, Thurston)
I-5/Mellen Street to Blakeslee Junction – Add Lanes, I/C Improvements (Lewis)
I-5/Mellen St. Interchange – Interchange Improvements (Lewis)
I-5 Mellen Street to Grand Mound – Widening and interchange reconstruction (Lewis, Thurston)

SR 410/214th Ave E to 234th - Add lanes (Pierce)

This project, currently in the design phase and budgeted for $29.3 million, will construct two additional general purpose lanes, a median barrier, and a traffic signal to improve traffic operations and mobility.

In addition to the prior delay to minimize impacts to wetlands, the advertisement date has now been further adjusted from February 2009 to August 2009 because additional archaeological testing is required to complete the cultural resources report, due in December 2008. After the report is reviewed, the permitting process will begin, which could further affect the advertisement date.

WSDOT is currently evaluating any impact to the budget by the delay and monitoring the advertisement date. Information will be reported when it is available.

SR 522/Snohomish River Bridge to US 2 - Add lanes (Snohomish)

This project, budgeted for $176.5 million, will construct two new traffic lanes, including five new bridges, to form a four-lane divided highway. It will also include safety features, Intelligent Transportation System features, and provide fish passage and wildlife crossings. The project, roughly halfway through the design and preliminary engineering phases, will improve motorist safety and reduce congestion by doubling capacity from the existing two-lane roadway.

After WSDOT negotiated the consultant agreement to advance the final design to 50%, the design budget shortfall of $8.6 million reported last quarter has been reduced by $700,000 to $7.9 million. The $2.6 million right-of-way savings expected last quarter has increased by $2.0 million to $4.6 million. As a result, the anticipated project cost increase has been reduced from $8.6 million to $3.2 million.

WSDOT continues to assess design options to determine if the project cost can be brought within the $176.5 million budget; otherwise the project remains on schedule for a December 2009 advertisement. Updates will be reported as information becomes available.

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SR 529/Ebey Slough Bridge - Replace bridge (Snohomish)

This project, budgeted for $44 million, will replace the old Ebey Slough Bridge with a new fixed-span structure designed to meet current standards.

As reported in the June 2008 *Gray Notebook*, the project's budget continues to be at risk. Design is progressing after the completion of the geotechnical analysis. The project cost has been updated to $47 million to account for inflation and construction material cost escalation will be submitted as part of the 2009 budget request.

The results of a combined Cost Risk Assessment/Value Engineering (VE) workshop held in July forecasted a total cost of $70.5 million, which is $23.5 million more than the proposed 2009 budget request of $47 million. The VE study identified potential savings by considering an alternative sub-structure design that uses fewer and larger piles for each bridge support, and a modified method for removing the existing bridge. The alternative design recommendation has been analyzed and that revised cost is still $6-$10 million higher than the proposed 2009 budget proposal.

The advertisement for this project has been delayed three months, from January 2010 to March 2010. WSDOT delayed environmental permit applications to incorporate the proposed bridge design. It took longer than anticipated to prepare the new bridge design recommendations to address soil liquefaction design criteria after the geotechnical analysis.

WSDOT also continues to pursue several options for wetland mitigation, including partnering with Snohomish County on a county-owned site or developing its own site. WSDOT has until January 2009 to decide on an option to avoid further delay on the project. Updates will be provided as information becomes available.

SR 532/ Corridor improvements - Design-build (Snohomish, Island)

As a design-build corridor project, the SR 532 Corridor Improvements project now consists of five individual projects with a total budget of $82.2 million for the corridor. The budget reduction is due to WSDOT's decision to advertise the $481,000 fish barrier removal project in a future biennium. Other components include replacing the General Mark W. Clark Memorial Bridge and widening highway connections to the new bridge. When completed, it will improve traffic flow and motorist safety on the SR 532 corridor from Camano Island to I-5.

The Request for Qualifications (RFQ) was issued on August 1, 2008. Seven Statements of Qualification were submitted; the design-build teams were prequalified and will be asked to submit proposals. WSDOT will award the successful design-build contract in January or February 2009.

However, a cost risk assessment (CRA), updated in late July, now anticipates project costs of $112.1 million, $29.9 million more than the initial estimate. The CRA provided cost assessments for two advertisement alternatives. To minimize project costs, WSDOT chose to advertise the project as a fixed cost, variable scope design-build contract. This means the base proposal would construct key project elements, and if the budget allows, three optional proposals containing other project elements will also be awarded for construction.

WSDOT is also evaluating potential savings identified by a Value Engineering team in September.

The project's schedule continues to be at risk due to ongoing right-of-way acquisition and environmental permitting processes. Bridge construction may be impacted by the seasonal passage times of spawning fish, the relocation schedule for the high-tension power lines north of the bridge, and the nesting season of swallows protected under the Migratory Bird Treaty Act. In a positive development, the agreement to use Stillaguamish tribal land for freshwater mitigation was executed in mid-September 2008.

Updates will be reported as new information becomes available. Projects within this corridor include:

SR 532/270th St NW to 72nd Ave NW – Improve safety (Island)
SR 532/Sunrise Blvd to Davis Slough – Improve safety (Island)
SR 532/General Mark W. Clark Memorial Bridge – Improve safety (Snohomish)
SR 532/64th Ave NW to 12th Ave NW – Improve safety (Snohomish)
SR 532/General Mark W. Clark Memorial Bridge - Replace bridge (Snohomish)

U.S. 12/SR 124 Intersection – Building interchange (Walla Walla)

This project, budgeted for $26.8 million, will build a new interchange and bridge to replace two existing intersections. Removing the signal-controlled intersections will improve safety, reduce congestion, and enhance the area's economic vitality.

WSDOT has now entered into an agreement to purchase a desirable parcel for the land exchange with McNary National Wildlife Refuge; the exchange will take place after the required environmental evaluation and real estate transaction are completed. Completing the land exchange is a major milestone towards meeting the scheduled October 2009 advertisement date.

WSDOT is also continuing negotiations on other parcels of

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land needed for the project, but no problems are anticipated at this time.

US 12/Tieton River East Crossing | US 12/Tieton River West Crossing – Replace bridge (Yakima)

This project, budgeted for $14.3 million, will replace the two structurally deficient bridges across the Tieton River with two bridges that will be wider and meet current standards.

The project's schedule is still at risk pending agreement on a satisfactory road alignment. WSDOT has re-submitted a Joint Aquatic Resource Permit Application (JARPA) to Yakima County and supporting agencies.

Design work is otherwise 75% complete; the project is scheduled to be advertised in April 2009, with construction expected to begin in early summer 2009. An update will be provided as information becomes available.

Ferries updates

Port Townsend - Keystone vessel replacement project (Jefferson, Island)

This project, budgeted for $84.5 million, was intended to build two Island Home Class ferries and one Steilacoom II Class ferry. As reported in the March and June 2008 *Gray Notebooks*, the number of ferries to be constructed is at risk and contingent on the bidding process, which will open in early November. Once bids are analyzed, an update will be provided.

New 144-Auto Ferries (King, Kitsap, San Juan)

This project was originally budgeted for $283 million, to build up to three new 144-auto ferries. WSDOT now estimates the cost to complete three vessels at approximately $313 million and is exploring opportunities to address the funding shortage.

A two-part contract was signed in December 2007 with Todd's Pacific Shipyard. The first part of the contract to develop a preliminary design technical proposal, was originally due October 14, 2008, but has been delayed to December 14, 2008. The delay provides an opportunity for Todd's Shipyard to also bid on the 'Island Home' class ferries project. Upon approval of the technical budget, Part 2 of the contract, detailed design and construction, price and schedule, will be negotiated.

It is expected that a "Notice to Proceed" on Part 2 will be issued by April 2009, with the first vessel to be completed in February 2011. This schedule may be delayed if the companies included in the consortium to build these vessels are also selected to build the Island Home Class vessels.

Eagle Harbor Maintenance Facility (Kitsap)

The Eagle Harbor Maintenance Facility Preservation Project has multiple stages of work which total $46.3 million. The current stage of work, a $31.6 million renovation project, addresses the maintenance building, dock, and a slip bridge structure at Eagle Harbor. The reconstruction of the slip bridge was completed in 2006 on-time and on-budget for $7 million.

As reported in the June 2008 *Gray Notebook*, WSDOT had obtained all permits except for a building permit from the City of Bainbridge Island. This permit was received from the City of Bainbridge Island on August 25, 2008. The project was advertised on September 15, 2008, and is scheduled to be completed in June 2011.

Mukilteo Multimodal Ferry Terminal (Snohomish)

This project, budgeted for $152 million, will relocate the terminal, provide a new terminal building, improve connections to other modes of transportation, and alleviate local traffic congestion.

The project continues to progress. Negotiations are being finalized with the Buzz Inn, adjacent to the existing terminal holding area, for a lease with a four-year initial term and two possible two-year extensions. The shoreline permit drawings were submitted by the Buzz Inn to the City of Mukilteo on September 3, 2008; WSDOT expects permits to be issued by April 2009. In order to accommodate the traffic circulation for the additional holding lanes, WSF will need to relocate a generator. Construction is expected to begin in spring 2009.

The overall schedule is at risk due to the long range planning process. As reported in the June 2008 *Gray Notebook*, WSDOT has analyzed and identified several different plans for a new terminal project within the current budget, but an option cannot be finalized until WSDOT finishes the processes mandated by the Legislature and applies those results to the proposed terminal design. An update will be published when information becomes available.

Rail updates

Vancouver - Rail Bypass and West 39th Street Bridge (Clark)

This project, budgeted for $115 million, will allow passenger trains to bypass freight trains, reducing congestion and improving schedule reliability. A bridge over the railroad tracks at West 39th Street will enhance vehicle and pedestrian safety.

This project's budget is at risk. With the rail design currently at 75% design, the overall project estimate is now $35.3 million higher than currently funded due to increases in the cost of construction

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materials and activities, notably steel and earthwork.

The schedule is also at risk. The remaining rail work will not be completed until July 2012, a one-year delay, as it cannot be done until the bridge is constructed. The bridge has been further delayed to January 2009 to obtain the necessary right-of-way, and will not be completed until October 2010. Updates will be provided as information becomes available.

Tacoma – Bypass of Pt Defiance (Pierce)

This project, currently in the design phase and budgeted for $59.6 million, will construct a 20-mile bypass route through Lakewood, in coordination with Sound Transit. This bypass will reduce the Amtrak *Cascades* schedule between Seattle and Portland by six minutes.

This project's budget continues to be at risk. The work is progressing in phases to align with available funding. WSDOT has applied for a $6 million grant from the Federal Rail Administration (FRA) on behalf of Sound Transit's project. The FRA is scheduled to release the results to the grantees by October 2008.

This change in strategy will also delay the first stage of work going to advertisement until October 2008 so the design can be modified to match the reduced scope of work for this first stage.

If the entire project goes to advertisement during the 2009-11 biennium, the project cost would increase by $14.9 million. Due to projected budget shortfalls, WSDOT is looking at options to balance cash flow. One of the options is to construct a portion of the project, the connection with the mainline in the Nisqually-area, in the 2009-11 biennium and defer starting the remaining work until 2011-13. However, if the remainder of the work is completed by 2015, the total cost of the project will be $99.9 million, $40.3 million over the original estimate.

Mount Vernon - Siding Improvements (Skagit)

This project, budgeted for $3.8 million, extends the existing rail siding to avoid rail conflicts, allowing the southbound train from Bellingham to depart earlier in the day.

This project's schedule continues to be at risk. Since the Washington Utilities Transportation Commission (WUTC) released its final decision requiring implementation of several safety measures before closing Hickox Road, appeals have been officially filed by BNSF and a private citizen. If the project moves forward, there will be schedule delays and possible budget implications.

Further, the lawsuit filed by the City of Mount Vernon in October 2007 against WSDOT for filing improper notice in preparation for the closure is still pending. Neither the City nor WSDOT has taken any further action while the decision for crossing closure is pending. An update will be published when information becomes available.

Everett - Curve Realignment and Storage Tracks (Snohomish)

This project, budgeted for $14 million, will realign curves to improve speeds for passenger service on the Seattle – Vancouver, B.C. route.

BNSF recently released their final estimate which indicates that the project is now underfunded by $900,000. The primary reasons for the cost increase are inflation and unanticipated contaminated soils. WSDOT and BNSF are reviewing the estimate and scope for options to place the project back within budget.

In order to complete this project, it is necessary for BNSF Railway to fill wetlands on their property. BNSF continues to work with the Army Corps of Engineers and the Washington State Department of Ecology to obtain the required wetland permitting. As reported in the June 2008 *Gray Notebook*, it was estimated the permits would be obtained by June 2008, but the applications have not yet been approved. Both BNSF and WSDOT are looking at options to begin construction on parts of the project that do not require the wetland permits. Once permits are obtained, construction can begin in the areas that require the wetland permits.

The budget issue and permitting delay will further delay advertisement to April 2009, which also delays the project completion date to April 2010.

Stanwood - New station, siding upgrades (Snohomish)

These two projects, budgeted for $21 million, will construct a new train platform to serve Amtrak Cascades passengers, and upgrade and extend the siding in Stanwood.

As discussed in the June 30, 2008, *Gray Notebook*, permission from BNSF for Amtrak trains to use the new station platform depends upon the construction of the siding extension, which in turn depends upon a decision by the Washington Utilities & Transportation Commission (WUTC) to allow closure of a local road crossing at Logan Road.

No date has been set by the WUTC for their decision; it may take up to 18 months, depending upon local opposition to or support of the closure. Nonetheless, on August 1, BNSF applied for environmental permits pertaining to the siding extension; it may take up to 180 days to receive these permits. In addition, BNSF has agreed to allow station construction to begin despite

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possible delays to the siding extension project. WSDOT is proceeding with the station construction management agreement with Amtrak, and the station project is scheduled to go to advertisement in October 2008.

Delays in receiving the WUTC road closure decision and in the environmental permitting process place the construction start and operationally complete dates at risk for the siding extension. Since the station will be constructed before the siding extension, WSDOT will work with BNSF on an agreement to allow service at the new station while the siding extension is in design and construction.

Removed from Watch List

US 101/ Dawley Rd vicinity to Blyn Highway – Add climbing lane (Clallam)

This project, budgeted at $3.5 million, will construct a northbound truck climbing lane to reduce congestion and improve motorist safety. This section of US 101 experiences back-ups due to high truck volumes and steep grades.

As reported in the June 2008 *Gray Notebook*, the estimate to complete this project increased by $3.52 million and the advertisement date was delayed seven months from September 2008 to April 2009 for redesign.

Since last quarter, WSDOT has re-analyzed the benefit/cost ratio of this project, in light of doubled costs and schedule delays. Based on the analysis and long-range revenue projections, WSDOT will recommend the advertisement date be deferred an additional 11 years, from April 2009 to June of 2020, as part of the 2009-2011 budget request to the Legislature. The wait for Congressional approval on a USFW property acquisition is no longer an issue because of the 11-year delay.

I-5/SR 432 Talley Way Interchanges – Rebuild interchanges (Cowlitz)

This safety project is budgeted for $45 million and will reconstruct two interchanges: the I-5 interchange at SR 432 and the adjacent SR 432 Interchange at Talley Way. These two, closely spaced interchanges experience congestion and operational problems. This project will improve safety, create better connections between existing roads, increase capacity, and decrease congestion.

As reported in the June 2008 *Gray Notebook*, this project was experiencing significant cost increases associated with new bridge design requirements. Based on a refined estimate and the risks associated with the geotechnical conditions, the structure over I-5 will not be replaced in this project. The updated plan will instead redesign the ramp approaching the bridge to improve sight distance. WSDOT has met with the National Marine Fisheries Service regarding environmental documentation requirements and the earlier concerns about the project's influence on local development have been resolved.

Based on the refined design, this project will be back on schedule and within budget.

SR 104/Hood Canal Bridge - Replace E Half (Jefferson, Kitsap)

This project, budgeted at $470 million, will replace the east half, floating portion of the Hood Canal Bridge, and the east and west approach spans.

As reported in the June 2008 *Gray Notebook* (page 79), there is a $29 million cost increase on the total project estimate, which when combined with work acceleration results in an over-expenditure of $36 million this biennium. Factors for the cost increase include cost of materials, fuel, extended materials storage, and problems associated with constructing bridge components at confined and congested sites. WSDOT has evaluated several options to cover both the total cost increase and the acceleration from 2009-11. The recommended solution (as was included in the agency's 2009 budget request) covers the increases with Federal Bridge Replacement funds. WSDOT has requested approval from the Office of Financial Management to proceed with the increase.

I-405/SR 515-New Interchange (also known as I-405, I-5 to SR 169 Stage 2-Widening and SR 515 Interchange)
I-405/SR 167 to SR 169 - NB Widening
I-405/SR 167 to SR 169 - Add new SB Lane (King)

This project, budgeted at $175.6 million, will add a lane in each direction on I-405 between SR 167 and SR 169. It will also build a half-diamond interchange with new ramp connections between I-405 and SR 515. When completed, it will reduce congestion and improve traffic flow.

As reported in the June 2008 *Gray Notebook*, WSDOT decided to forgo an advertisement date, which was expected to cause a potential increase of $5 to $10 million in construction costs.

The project is now scheduled to be advertised on the legislative commitment schedule in October 2008, which may extend the construction from two to three seasons. Currently, the total project cost is estimated to be below the budget.

Watch List: Projects with schedule and budget concerns

SR305/ Hostmark St vicinity to Bond Rd – Paving, HOV lanes (Kitsap)

This combined project, budgeted at $32.2 million, adds two HOV lanes, intersection improvements, bike lanes, and sidewalks. Completed two months early in August 2008, its improvements will reduce congestion and enhance pedestrian and bicyclist safety.

As reported in the June 2008 *Gray Notebook*, a $7.6 million budget overrun was caused by escalating asphalt prices, weather impacts, additional traffic safety needs, and the need for a third construction season. WSDOT's 2009 Supplemental Budget request is expected to accommodate the cost increase through multiple program adjustments. The contractor claim mentioned in the June 2008 *Gray Notebook* is still pending. An update will be provided when these remaining elements are concluded.

I-5/172nd St NE (SR 531 Smokey Point) Interchange - Rebuild interchange (Snohomish)

This project at the I-5 and SR 531 interchange is budgeted for $44.6 million. Currently in the design phase, it will construct a new two-lane on-ramp, realign and widen the existing ramps, and connect them to the recently completed six-lane bridge over I-5. In January 2008, WSDOT added a section of a federally funded paving project along I-5 to this project to coordinate construction at the interchange for increased cost efficiencies.

The June 2008 *Gray Notebook* reported that the project schedule was at risk if WSDOT was not able to acquire needed right-of-way in time to receive federal funding approval for the October 2008 advertisement. The final acquisition of access rights on properties required to close a local street will continue into summer 2009. It is expected that the FHWA will nonetheless approve the federal funds in time to meet the advertisement date.

SR 9/Schloman Rd to 256th St NE – New alignment;
SR 9/252nd St NE vicinity – Add turn lane
SR 9/268th St Intersection – Add turn lane (Snohomish)

These three projects are budgeted for a total of $20.7 million. They will widen SR 9 to provide 12-foot lanes and 4-foot shoulders, and realign two curves on this section of road. Northbound left-turn lanes will be added at the intersections. The SR9/268th Street project will require wetland mitigation, illumination improvements, and hazardous waste removal.

In August, crews finished widening SR 9 for the new turn lanes at 252nd Street NE and 268th Street NE. Final paving was completed in September. As a result, this combined project was operationally complete 14 months early and within the approved budget.

SR 542/Nooksack River – Redirect river and realign roadway (Whatcom)

This project, budgeted for $16.6 million, will reduce seasonal flooding damage and road closures along the Nooksack River. The work, to be advertised as four separate contracts, will either realign SR 542 further from the Nooksack River or divert the river further away from SR 542.

As reported in the June 2008 *Gray Notebook*, the advertisement date on the first contract was rescheduled from May 2008 to January 2009 to allow sufficient time to appraise and renegotiate a settlement on the one outstanding parcel of land. WSDOT is currently preparing to make a revised offer on the property based on an updated appraisal.

This first contract's delay is not expected to affect the planned May 2011 operationally complete date. The second contract is on schedule to be advertised in January 2009 as originally planned.

Bellingham - Waterfront restoration, Georgia Pacific-area upgrades (Whatcom)

These two projects, budgeted for $5.7 million, would relocate the BNSF main line near Bellingham's central waterfront to allow redevelopment of the former Georgia Pacific site for commercial and residential uses. The City and Port of Bellingham's master plan includes two new roadway bridges over the new track.

As reported in the June 2008 *Gray Notebook*, the lack of funds to complete both the rail and roadway projects, plus archeological discoveries, prompted the 2008 Legislature to move state funding to the 2009-2011 biennium.

After the City and Port complete their Master Plan and Environmental Impact Study for the entire area, WSDOT intends to use $140,000 in federal funds to perform additional cultural resource investigations, beginning fall 2008.

WSDOT proposes to use the remaining funds, about $180,000, to modify the track super-elevation near the former Georgia Pacific Plant. Modifying the track super-elevation would allow for higher train speeds and improve schedule reliability for Amtrak *Cascades* passenger trains.

Cross Cutting Management Issues

Project Management and Reporting Systems

WSDOT is currently delivering the largest transportation construction program in our state's history— hundreds of projects worth more than $15 billion. WSDOT is managing this program using best management practices proven throughout the country in both the public and private sectors, including a Project Management and Reporting System (PMRS). PMRS is an information backbone and set of tools to help project managers deliver projects on-time and within scope and budget.

This article describes recent PMRS accomplishments. Information about project management at WSDOT is available at http://www.wsdot.wa.gov/Projects/ProjectMgmt/.

Recent Project Management and Reporting System accomplishments

- The Enterprise Content Management software has been configured and deployed to all eight regions. The first set of documents to be loaded in the system will come from Real Estate and Right-of-Way, followed by Environmental and Design documents.
- Primavera Scheduler and Web Access have been configured and deployment is underway in three regions and WSDOT Headquarters. Full deployment will be completed by mid-2009.
- Primavera Contract Manager has been configured to process contract submittals and requests for information. These modules will be deployed to all regions by December 2008.
- The Project Management Academy is implemented and WSDOT has trained 240 graduates.
- The Project Control and Reporting sub-system has been completed and 210 staff have been trained.
- Integration with WSDOT's legacy systems is underway. The interface between Primavera Scheduler and the Capital Project Management System (CPMS) is completed. In addition, the interface between Primavera Scheduler and the Transportation Reporting and Accounting Information System (TRAINS) has been programmed and is being tested.
- A needs assessment and design is underway for the cost management portion of the system.
- The Project Change Request Form has been developed with an automated workflow and has been implemented in all regions.
- WSDOT has negotiated with Primavera to establish an enterprise software license that includes all Primavera software products used in the PMRS. This will significantly simplify WSDOT's management of the software and reduces the purchase price.

Project Management Information Systems Highlights

Primavera Scheduler and Web Access software deployment is underway in three regions and WSDOT Headquarters. Full deployment will be completed by mid-2009.

Personnel in all eight regions have been trained to use the Enterprise Content Management software and deployment is underway in all regions.

Interfaces between Project Management and Reporting System and two of WSDOT's legacy systems have been completed. The Capital Program Management System (CPMS) interface is in use and the Transportation Reporting and Information System (TEIS) is developed and being tested.

Use of Consultants

WSDOT uses consultants to complete tasks and projects that the department does not have the resources or the expertise to perform internally. WSDOT uses two different types of consultant agreements: task order agreements and project-specific agreements.

Task order agreements comprise the majority of consultant contracts. Every six months, WSDOT assesses the types of work services that it consistently uses, including preliminary engineering, traffic engineering, real estate appraisal and negotiation, land surveying, and transportation studies. Based on the biennial estimated needs, the agency advertises for predetermined categories of work and initiates multiple task order agreements for each category. Next, WSDOT regions determine if work can be completed using a task order agreement.

Project specific agreements, which are individually advertised by project, are typically used for work that cannot be performed using a task order agreement. For example, WSDOT might use a project specific agreement to design a bridge or a ferry terminal.

From April 1, 2008 to September 30, 2008, the net totals of new consultant expenditures were $60,808,321 for task order agreement projects, $18,172,861 for project specific agreement projects, and $32,993,601 for general engineering consultant agreements. For a breakdown of the $111,974,783 in total expenditures for the period, see the first table on the following page.

Task order agreements

One hundred-sixteen task order agreements had Nickel project expenditures during the period. The total expenditures for services rendered were $2,073,168 for 53 prime consultant firms. Eighty-seven task order agreements had Transportation Partnership Account (TPA) project expenditures during this period; expenditure totals were $23,307,029 for 72 prime consultant firms. The overall statewide task order agreement consultant expenditures (excluding Nickel, TPA, and General Engineering consultants) for the same period were $35,428,124. For a list of significant authorizations for consultants, see the second table on the following page.

General engineering agreements

As discussed in the March 31, 2007, *Gray Notebook* (p. 40), eight high-profile general engineering consultant (GEC) projects were to receive consultant agreements during the period of April 1, 2008 to September 30, 2008. GEC expenditure totals were $32,993,601, divided between eight primary consultant firms, of which $13,316,902 were Nickel funds and $19,676,697 were TPA funds. For a breakdown of the projects, see the third table on this page.

Consultant Use Highlights

WSDOT consultant spending totaled $111,974,783 between April 1, 2008 and Sept. 30, 2008.

Consultants contributed to many major projects including the SR 520 Bridge Replacement, the Columbia River Crossing, and the I-90 Snoqualmie Pass project.

WSDOT uses consultants for preliminary engineering, land surveying, real estate negotiation, transportation studies and other services.

Consultant utilization definitions & examples

Authorization type	Description	Project examples	Service performed by consultant
Task Order Agreements	Consultant performs regularly occurring work in one of multiple categories including preliminary engineering, traffic engineering, real estate appraisal and negotiation, land surveying, and transportation studies work.	U.S. 12 - Wallula to Walla Walla Corridor Study (Nickel and TPA)	David Evans and Associates conducted a preliminary environmental investigation on preferred corridor alignments for U.S. 12 from the Wallula junction to the city of Walla Walla.
General Engineering Agreements	Consultant supervises the planning, design, and program management responsibilities for very large scale mega-projects, or clusters of related projects.	SR 167 Valley Freeway Corridor (Nickel)	Perteet is organizing the corridor project's partnership groups, handling the public involvement process, and evaluating environmental documentation.
Project Specific Agreements	Consultant performs services for a specific project when an on-call consultant is unavailable to perform such work.	SR 520 West Lake Sammamish Boulevard to SR 202 (Nickel)	CH2M Hill was selected as the prime design consultant for stages 3A and 3B of a flyover ramp that will comply with the City of Redmond's stormwater design codes.

Data source: WSDOT Consultant Services Office.

Use of Consultants

Project-specific agreements

From April 1, 2008 to September 30, 2008, new expenditures for project-specific Nickel agreements and/or supplements totaling $6,765,826 were divided between 27 prime consultants. New expenditures for project-specific TPA agreements and/or supplements were $6,555,115, divided between 23 prime consultants. All non-Nickel/TPA, project-specific, consultant authorizations totaled $4,851,920. The fourth table on this page lists significant authorizations for project-specific agreements.

Consultant expenditures

April 1, 2008, through September 30, 2008, dollars in millions

Type of consultant agreement	Nickel	TPA	PEF	Total
Task order consultant agreements (including GEC agreements)	$15.4	$43.0	$35.4	$93.8
Project-specific agreements/supplements	$6.8	$6.6	$4.9	$18.2
Totals	$22.2	$49.6	$40.3	$112.0

Data Source: WSDOT Consultant Services Office.

Significant authorizations for task order consultants

April 1, 2008, through September 30, 2008, dollars in millions

Project	Consultant	Total expenditures
Columbia River Crossing Project (TPA, PEF)	David Evans and Associates, Inc.	$7.3
Statewide Program Management Consultant (Nicket, TPA, PEF)	PB Americas, Inc.	$2.3
On-Call UCO Engineering Management Services (Nickel, TPA, PEF)	Parametrix, Inc.	$2.6
Alaskan Way Viaduct and Seawall EIS (TPA, PEF)	PB Americas, Inc.	$18.5
SR 520,Trans-Lake Washington Project (Nickel, TPA)	Parametrix, Inc.	$19.5

Data Source: WSDOT Consultant Services Office.

Expenditures for GEC consultants

April 1, 2008, through September 30, 2008, dollars in millions

Project	Consultant	Expended this period
GEC Alaskan Way Viaduct & Seawall Replacement Project	Hatch Mott MacDonald	$0.9
GEC I-90 Snoqualmie Pass East – Hyak to Keechelus Dam	URS Corporation	$4.3
GEC Northwest Region Mt. Baker Area	H.W. Lochner, Inc.	$1.2
GEC Northwest Region Mt. Sno-King Area	DMJM Harris, Inc	$0.8
GEC SR 167 Extension	Carter & Burgess, Inc.	$0.5
GEC SR 167 Valley Freeway Corridor	Perteet, Inc.	$0.9
GEC SR 520 Bridge Replacement and HOV Project	HDR Engineering, Inc.	$9.5
GEC Tacoma/Pierce County HOV Program	CH2M Hill, Inc.	$14.7
Total		32.8

Data Source: WSDOT Consultant Services Office. Note: Numbers do not add exactly to total due to rounding.

Significant authorizations for project-specific consultants

April 1, 2008, through September 30, 2008, dollars in millions

Project	Consultant	Total expenditures
I-405 General Engineering Consultant (Nickel, TPA)	HNTB Corporation	$9.2
SR 520, West Lake Sammamish Boulevard to SR 202 (Nickel)	CH2M Hill, Inc.	$1.4
SR 522, Snohomish River Bridge to U.S. 2 (Nickel)	Parametrix	$1.1

Data Source: WSDOT Consultant Services Office.

Hot Mix Asphalt

Hot Mix Asphalt Highlights for 2008 Construction Season

WSDOT's projected HMA awards through September 30, 2008 were 1,322,418 tons: a 2% increase over the projected HMA award tonnage in 2007.

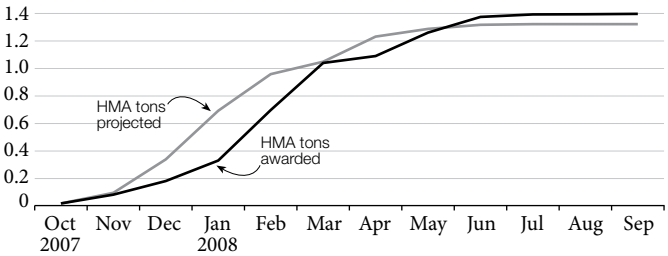
WSDOT tracks both the projected and awarded amounts of Hot Mix Asphalt (HMA) for two reasons. First, the agency projects HMA amounts so that contractors can better anticipate future HMA volumes. This helps private contractors better manage their costs associated with HMA, which ultimately results in improved competitive bidding and accurate estimates for WSDOT's construction projects. Second, WSDOT measures tons of HMA awarded against the forecast as an indicator of the agency's estimating accuracy.

Actual Hot Mix Asphalt tons awarded in 2008 above projection by 6%

In October 2007, WSDOT forecasted that 1,322,418 tons of Hot Mix Asphalt (HMA) would be awarded in contracts throughout the state by September 2008. The final amount was 1,397,189 tons awarded, or 6% greater than the original forecast. This represents a difference of 74,771 tons. In 2007, the actual HMA awarded was 6% below the amount forecast.

Hot Mix Asphalt tons awarded

October 2007-September 2008
Tons in millions



Data Source: WSDOT Construction Office.

Crews apply HMA as part of the SR 539 - Horton to Ten Mile road project north of Bellingham in early 2008.

The actual HMA awards for the 2008 construction season totaled 1,397,189 tons: 13% more than what was actually awarded in 2007.

For the 2008 construction season, actual HMA awarded tonnage was 6% above projections, the exact opposite of the 2007 construction season where actual awarded tonnage was 6% under projections.

Hot Mix Asphalt - projected vs. actual tons awarded

2002 - 2008, From October 1 through September 30 of each year[1]

Year	Projected	Actual	% Difference
2002	1,373,465[2]	1,364,021	-1%
2003	1,417,126	1,825,442	+29%[3]
2004	1,324,218	1,299,377	-2%
2005	1,779,826	1,685,394	-5%
2006	1,213,985	1,126,701	-7%
2007	1,297,601	1,214,544	-6%
2008	1,322,418	1,397,189	+6%

Data Source: WSDOT Construction Office.

[1] Awarded tons are tracked on an October through September calendar year, providing a better measurement of the work schedule and better planning for the paving industry than the calendar year. Construction projects awarded in the fall typically do not begin work until the next year's construction season begins in the Spring.

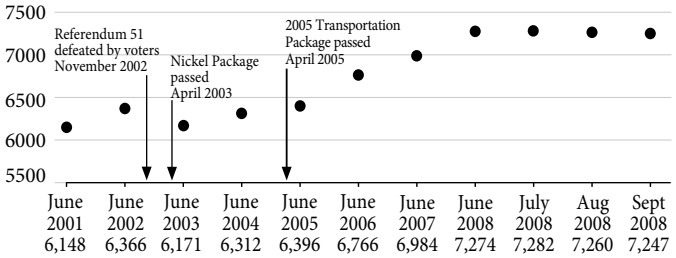
[2] The projection for 2002 was revised in March 2002 by the Transportation Commission following budget cuts.

[3] The 2003 Nickel Transportation Funding Package was passed after the projection was made for 2003. WSDOT subsequently awarded five projects from the Nickel funding package with a combined total of 315,285 tons of HMA.

Workforce Level and Training: Quarterly Update

This quarter, WSDOT employed 7,247 permanent full-time employees, a decrease of 27 employees from the previous quarter. The total number of full-time employees declined slightly in August and September after increasing slightly in July. The full-time employee total does not include permanent part-time, seasonal, and on-call workers. The chart below shows the total number of full-time employees since the end of fiscal year (FY) 2001. The total number of full-time equivalencies (FTEs) will generally exceed the number of permanent full-time employees as seasonal and part-time workers are funded from FTE allocations. For information on use of consultants, see pages 127-8.

Number of permanent full-time employees at WSDOT



Data Source: Dept. of Personnel Data Warehouse, HRMS, WSDOT and the ferry system payroll.

Workforce training compliance improved

Diversity training compliance improved for each of the three courses required for all WSDOT employees, compared to the last quarter. Compliance increased 4% for valuing diversity, 2% for disability awareness, and 5% for sexual harassment/discrimination. However, the increase in sexual harassment/discrimination training was not enough to offset the 13% decrease in compliance in the previous quarter, which is associated with the increased frequency requirement for refresher compliance since March 30 2008.

The schedule for next year will reduce travel and address the reduction in Office of Equal Opportunity (OEO) staff available to conduct training. In order to maximize compliance in a manner consistent with current travel restrictions and staff limitations, WSDOT will utilize training sites with capacity for large class sizes.

OEO is developing diversity sexual harassment training materials for the legislatively mandated supervisor training course that will not require instructors, similar to the mandatory ethics training that is taken on an individual basis. This mode of training will eliminate costs otherwise needed to train the estimated 3,400 supervisors.

Workforce level and training highlights

The workforce level declined slightly during the third quarter to 7,247 permanent full-time employees.

Compliance levels improved for each of the six training courses required for all employees.

WSDOT training compliance was 82% for statutorily required safety and maintenance courses.

Six of seven regions improved compliance for safety and maintenance training courses..

Worker compliance with mandatory training for all WSDOT workers
First quarter, FY 2009

Training Course	Employees requiring training	Basic training completed to date	Workers needing basic training	Workers needing refresher training	Completed training reporting quarter	Total in compliance	% in compliance	% change from previous quarter
Disability awareness	8,132	6,976	1,141	349	298	6,642	82%	2%
Ethical standards	8,132	7,845	272	1,824	245	6,036	74%	2%
Security awareness	8,132	6,566	1,551	N/A	62	6,581	81%	2%
Sexual harassment/ discrimination	8,132	7,280	837	1,327	486	5,968	73%	5%
Valuing diversity	8,132	6,988	1,129	438	416	6,565	81%	4%
Violence that affects the workplace	8,132	6,940	1,177	N/A	91	6,955	86%	2%

Data Source: WSDOT Office of Human Resources, Staff Development.

Statutorily required maintenance training

Compliance for statutorily required maintenance employees improved to 82% this quarter, a 3% increase over last quarter. WSDOT's goal is to achieve 90% compliance for statutorily required training for maintenance employees. Numerous state laws and regulations stipulate specific training requirements for many activities maintenance workers perform. Regional maintenance and safety trainers use a variety of approaches to increase compliance rates and provide training. Training compliance fluctuates by season and is generally higher in the fall and spring, when more employees are available for training.

Statutorily required training	Total requiring training	Total people complying	% complying current quarter	% change from last quarter	Past biennium average	Current biennium average
Aerial Lift	174	156	90%	-1%	87%	93%
Bucket Truck	372	293	79%	0%	82%	80%
Confined Space Entry	505	418	83%	2%	79%	83%
Drug & Alcohol Certification	1,199	1,115	93%	4%	90%	89%
Drug-free Workplace	338	306	91%	1%	87%	90%
Electrical Safety Awareness	307	191	62%	-1%	57%	61%
Excavation, Trenching & Shoring	392	321	82%	0%	81%	83%
Fall Protection	729	632	87%	1%	84%	84%
Forklift	1,099	941	86%	0%	89%	87%
Hazard Communications	1,406	1,255	89%	2%	84%	88%
Lockout/Tag Out	573	476	83%	1%	72%	83%
Personal Protective Equipment	1,395	1,204	86%	1%	83%	85%
Proper Lifting	1,451	1,238	85%	5%	71%	80%
Supervisor Return to Work	203	159	78%	-1%	73%	78%
Blood-borne Pathogens[1]	585	324	55%	1%	56%	63%
Fire Extinguisher[1]	1,375	1,034	75%	11%	57%	70%
Hazardous Materials Awareness[1]	842	652	77%	5%	73%	78%
Hearing Conservation[1]	1,348	1,040	77%	-7%	76%	77%
Lead Exposure Control[1]	83	18	22%	-2%	35%	32%
Railway Work Certification[1]	28	18	64%	2%	69%	76%
Respirator Protection[1]	207	46	22%	-7%	17%	28%
Emissions Certification[2]	72	55	76%	0%	57%	76%
First Aid[3]	1,462	1,255	86%	9%	83%	79%
Flagging & Traffic Control[3]	1,108	1,030	93%	4%	92%	91%
Total	17,253	14,177	82%	3%	78%	81%

Data Source: WSDOT Office of Human Resources, Staff Development.

[1] Refresher training required annually; [2] Refresher training required every two years (previously reported incorrectly as every five years). [3] Refresher training required every three years.

Two regions achieve 90% goal

WSDOT tracks statutorily required training compliance for its maintenance workers by region. The table to the right documents each region's compliance with all the courses above as a single measure. Training compliance increased in six of seven regions during the third quarter of 2008, and the Eastern and Southwest regions continued to exceed the 90% compliance goal.

Required training for maintenance employees by WSDOT region

Region	Current quarter percent in compliance	Percent change from last quarter	Current biennium (2007-09) average	Past biennium (2005-07) average	Goal met
Northwest	77%	3%	74%	70	
North Central	80%	1%	80%	79	
Olympic	75%	-4%	75%	71	
Southwest	94%	3%	93%	91	✓
South Central	87%	8%	81%	79	
Eastern	93%	6%	90%	91	✓

Data Source: WSDOT Office of Human Resources, Staff Development.

Prior to a Jan. 27, 2009 revision, this table had reversed the current quarter and biennium average columns. This version is correct.

Highlights of Program Activities

For the quarter ending September 30, 2008

Project starts, updates or completions

Project starts

SR 6-South Fork Chehalis River Bridge Replacement (Lewis)

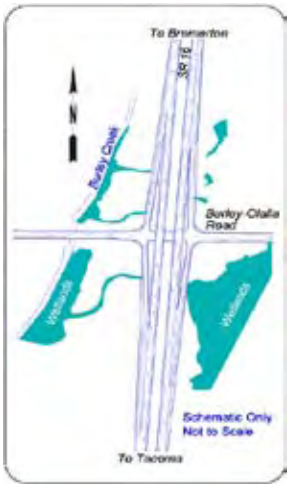
Work began on August 25 to build a new bridge over the South Fork of the Chehalis River on SR 6, which will improve safety and relieve congestion. It will be 40 feet wide, consisting of two 12-foot lanes with eight-foot shoulders. It will also be constructed on a new alignment 20 feet to the north of the existing bridge, flattening the curve at the eastern end.

The old bridge was built in 1925. It is only 20 feet wide, forcing large vehicles to stop and wait for oncoming traffic to clear the bridge before proceeding across. As a result, rear-end collisions are common. The existing bridge will not be removed until the new bridge is open to traffic, scheduled for late fall 2009.

SR 16-Burley Olalla Interchange (Kitsap)

Crews began construction of the new Burley Olalla interchange in August, with the closure of the intersection where traffic crosses the median on SR 16. Burley Olalla Road is the last at-grade intersection on SR 16 between Tacoma and Gorst with traffic that crosses the median.

At-grade intersections on high-speed, high-volume highways such as SR 16 have a high occurrence of collisions. The intersection at Burley Olalla Road is no exception— this stretch of SR 16 is traveled by about 42,000 vehicles a day. To improve safety on this stretch of road, WSDOT will be building new bridges on SR 16 and new on- and off-ramps at Burley Olalla Road.



The new SR 16 Burley-Olalla Interchange design.

U.S. 2- Index, Slide Repair (Snohomish)

Crews began permanent repairs to U.S. 2 east of Index on September 15, with work expected to continue through November. Steel beams will be used to construct a 200-foot-long wall in order to stabilize a section of roadway that sank over seven feet during record rains in November 2006. A new drainage system will help prevent further erosion. The road will then be repaved and the highway will return to its original configuration.

Project updates

I-90 Snoqualmie Pass East (Klickitat)

WSDOT, along with the Federal Highway Administration (FHWA), reached a major milestone in September with the release of the I-90 Snoqualmie Pass East project's final Environmental Impact Statement (EIS). The final EIS contains information on how WSDOT addressed the comments from the draft EIS, and identifies a preferred alternative. It also updates information on a wide range of environmental and engineering topics, including air quality, water resources, noise, cultural resources, transportation, economics, design challenges, fish and wildlife, and wetlands.

This project will add capacity and improve a 15-mile corridor east of Snoqualmie Pass by straightening roadway curves, stabilizing rock slopes, replacing deteriorating concrete pavement, and improving bridges, culverts, and ecological connections. The completed project, which will reduce road closures due to avalanches, will make the movement of people and goods on

A controlled avalanche falls over the current snowshed on I-90 Snoqualmie Pass, Winter 2007.

A design visualization of how the expanded snowshed on I-90 Snoqualmie Pass might look when completed.

this cross-state corridor more efficient while preserving and improving the environment affected by the project. Construction is scheduled to begin on the first five miles in 2009.

U.S. 97-Biggs Rapids, Sam Hill Bridge Deck Replacement (Klickitat)

The final stage of a project that replaces the U.S. 97 Biggs Bridge concrete deck began on September 8, with crews closing the bridge for the duration of construction. Crews will completely reconstruct the sout hportion of the bridge deck; the project is scheduled for south-portion completion early in 2009. The bridge must be closed to achieve the safest working conditions, as well as the best quality construction. Since the Biggs Bridge is designed as a flexible structure, able to accommodate the high winds and wide temperature range common in the Columbia River Gorge, any vibration or movement of the deck can affect the quality of new concrete as it cures. A full closure eliminates additional vibration due to traffic on the bridge, allowing the concrete to cure with minimal disturbance. This $16 million project, including deck replacement and bridge rail upgrades, is paid for by Washington and Oregon equally.

WSDOT closed the U.S. 97 Biggs Bridge on September 8 to complete the second phase of the concrete deck replacement project.

Project completions (See also pages 103-111)

SR 202 Widening (King)

Crews completed a four-year, $82 million project to widen 2.8 miles of SR 202 between SR 520 in Redmond and Sahalee Way in rural King County. They also made several safety improvements, including center medians, turn lanes, new signals, improved lighting, and new sidewalks. With a new lane added in each direction of SR 202, also known as Redmond Fall City Road, crews eliminated a major bottleneck and delivered much-needed congestion relief for the growing population in east King County. A new flyover ramp from SR 202 to westbound SR 520 removed freeway traffic from the local roadway and eliminated a double left turn onto westbound SR 520, another source of congestion.

Safety was also an issue for this corridor. More than 1,100 collisions were reported between 1995 and 2007. Now, landscaped medians separate opposing traffic, new turn lanes allow through-traffic to continue flowing, and left turns are limited to certain intersections. Sidewalks and bike lanes make the route safer for bicyclists and pedestrians, too.

SR 9-Schloman Rd. to 268th St. NE (Snohomish)

On September 23, crews began the final paving work on two miles of SR 9 near Arlington, bringing a $20.7 million safety improvement project nearer to completion. Crews wrapped up paving work by early October and needed a few dry nights to complete striping. With the completed project, drivers will notice smooth pavement, reflective striping, and new left-turn lanes at 252nd Street NE and 268th Street NE. Drivers have already benefited from a new, straight, one-mile section of highway between Harvey Creek Road and 252nd Street NE, which opened to traffic in June 2008.

Public transportation

Governor Gregoire honors top 25 employers with "Commute Smart Award"

Washington employers with exceptional employee transportation programs were honored with the "Governor's Commute Smart Award." Washington Transportation Secretary Paula Hammond presented the awards during the September 10 closing luncheon of WSDOT's Public Transportation Conference and Expo in Kennewick. Employers were recognized for model programs encouraging positive change in their employees' commuting habits and reducing drive-alone commuting. Washington's Commute Trip Reduction (CTR) Task Force (now the CTR Board) started the awards program in 1998. WSDOT solicited nominations and selected this year's winners.

In all, 25 companies were honored in 13 categories. Amgen, Inc., a biotechnology company, was awarded the Champion Award, honoring consistent, time-proven leadership in commute trip reduction. Wood Stone Corporation in Bellingham received one of four Site Challenges awards, which recognizes employers who have achieved program success despite limited transit service or highly secure work sites.

Ribbon cutting: Travel Washington Dungeness Line

WSDOT held a ribbon-cutting ceremony on September 17, celebrating the Travel Washington Dungeness Line bus service from Port Angeles to SeaTac. The Travel Washington Dungeness Line is the next step in establishing the Washington Intercity Rural Bus Program. The service will offer two daily, scheduled, round trips between Port Angeles and SeaTac. It is part of the only intercity statewide network in the nation funded through a Federal Transit Administration pilot program that matches private sector investments with grant money. WSDOT awarded the grant to Olympic Bus Lines to provide the service.

Intercity transportation is not only about getting from Port Angeles to SeaTac, it is also about connecting Port Angeles to any place in the country. All of the Travel Washington routes will make connections with other intercity carriers, giving-people reliable transportation to wherever they want to go.

Traveler information

WSDOT provides four new portable cameras to keep an eye on I-90 traffic near Snoqualmie Pass

WSDOT placed four new portable, trailer-mounted electronic signs and cameras along I-90 between Denny Creek and Elk Heights to help traffic managers and travelers keep an eye on traffic. These cameras were placed in areas where back-ups and delays typically occur on weekends and holidays during the summer. New cameras are located at: I-90 Denny Creek Road (milepost MP 47), I-90 Golf Course Road (milepost 77), I-90 Cle Elum (milepost 85), and Elk Heights (milepost 93). WSDOT traffic cameras across the state feed information to our seven Traffic Management Centers located in Shoreline, Tacoma, Bellingham, Vancouver, Yakima, Wenatchee and Spokane. WSDOT then uses this information to coordinate responses to clear accidents and notify the public and media.

Announcements, awards, and events

WSDOT recognized for "Excellence in HOV/HOT Communication and Outreach"

On September 9, at the Transportation Research Board's 13th International HOV/HOT Systems Conference, Mark Bandy accepted an award on WSDOT's behalf for excellence in communication and outreach on the SR 167 HOT Lanes project. WSDOT's approach used multiple techniques and media, and followed the basic principles of successful marketing and public information campaigns.

Project Manager Patty Rubstello led WSDOT's marketing, communications, and outreach efforts for the SR 167 HOT project in Seattle. Under her leadership, the project's outreach program represented a proactive approach to providing key information on a new HOT project. The use of multiple media, brochures in different languages, and other innovative outreach activities helped ensure the successful introduction of the SR 167 HOT lanes last May.

On WSDOT's website, citizens can take a virtual tour of the HOT lanes to become better acquainted with how they work.

See http://www.wsdot.wa.gov/projects/sr167/hotlanes/

Tacoma Narrows Bridge Project a finalist in National Transportation Award competition

The Tacoma Narrows Bridge was one of 10 finalists for the prestigious "America's Transportation Award," reflecting the best in management and innovation, presented by the American Association of State Highway Transportation Officials (AASHTO). Forty-one projects were entered into the competition, with 23 chosen as regional winners, narrowing the field to ten finalists.

These finalists competed for two grand national prizes decided by an online voting process that started on August 13 and ended October 19. The Tacoma Narrows Bridge project team won the regional competition among 18 western states in the category for "on-time delivery" for projects exceeding $200 million, but the grand prizes were won by bridges in Mississippi and between Virginia and Maryland.

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Americans with Disabilities Act (ADA) Information

Persons with disabilities may request this information be prepared and supplied in alternate formats by calling the Washington State Department of Transportation at (360) 705-7097. Persons who are deaf or hard of hearing may call access Washington State Telecommunications Relay Service by dialing 7-1-1 and asking to be connected to (360) 705-7097.

Civil Rights Act of 1964, Title VI Statement to Public

Washington State Department of Transportation (WSDOT) hereby gives public notice that it is the policy of the department to assure full compliance with Title VI of the Civil Rights Act of 1964, the Civil Rights Restoration Act of 1987, and related statutes and regulations in all programs and activities. Persons wishing information may call the WSDOT Office of Equal Opportunity at (360) 705-7098.

Other WSDOT Information Available

The Washington State Department of Transportation has a vast amount of traveler information available. Current traffic and weather information is available by dialing 5-1-1 from most phones. This automated telephone system provides information on:

- Puget Sound traffic conditions
- Statewide construction impacts
- Statewide incident information
- Mountain pass conditions
- Weather information
- State ferry system information, and
- Phone numbers for transit, passenger rail, airlines and travel information systems in adjacent states and for British Columbia.

For additional information about highway traffic flow and cameras, ferry routes and schedules, Amtrak Cascades rail, and other transportation operations, as well as WSDOT programs and projects, visit http://www.wsdot.wa.gov

For this or a previous edition of the *Gray Notebook*, visit www.wsdot.wa.gov/accountability

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