



**Washington State
Department of Transportation**

Measures, Markers and Mileposts

The Gray Notebook for the quarter ending March 31, 2002

WSDOT's quarterly report to the
Washington State Transportation Commission
on transportation programs and department management

Douglas B. MacDonald
Secretary of Transportation



Measures, Markers and Mileposts

The Gray Notebook for the quarter ending March 31, 2002

5th Edition

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For current or previous editions of *Gray Notebook* reports, visit our website at www.wsdot.wa.gov/accountability

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"What gets measured, gets managed."

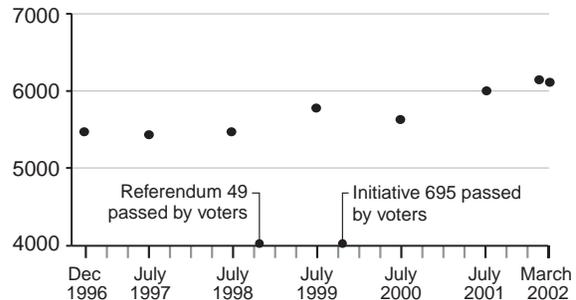
This periodic report is prepared by WSDOT staff to track a variety of performance and accountability measures for routine review by the Transportation Commission and others. The content and format of this report is expected to develop as time passes. Information is reported on a preliminary basis as appropriate and available for internal management use and is subject to correction and clarification.

WSDOT Workforce Levels

Many confusing answers have circulated over the years to the question "How many people work at WSDOT?" Some of the confusion arises from the tendency to mistake "FTE" (full-time equivalents), a program sizing tool, for the actual number of employees at the agency at any given time. (The number of "FTEs" will generally exceed the number of full-time employees, since seasonal and part-time work force must also be funded from "FTE" allotments.)

The most trustworthy indicator of the agency's employee size is the current number of permanent full-time employees on staff. The accompanying chart shows that number at various points since the end of 1996. Current staffing reflects that in the 2001-2003 biennium, WSDOT is delivering one of the largest highway capital programs (approximately \$1.51 billion) ever undertaken in this state.

Number of Permanent Full-Time Employees at WSDOT



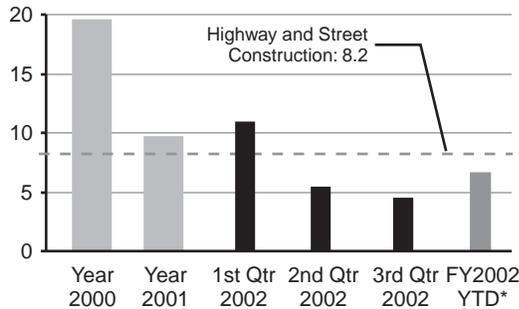
- Referendum 49 (Fiscal Year 1999) increased WSDOT's program and project delivery scope.
- Initiative 695 (Fiscal Year 2000) decreased available transportation funds and required adjustments to project and program scope.
- July 2000 to current: WSDOT has one of the biggest highway construction programs. To date the program is being delivered on budget with projects being finished on-time or ahead of schedule.

Worker Safety: Quarterly Update

Continuing updates on *Gray Notebook* safety topics – data is shown on a calendar year 2000 and 2001 and for fiscal year 2002 by quarter.

WSDOT Highway Maintenance Workers

Recordable Injuries per 100 Workers per Year

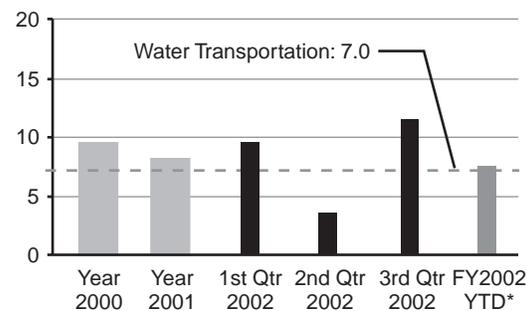


During Quarter 3 of fiscal year 2002, sprains (25%) and strains (19%) continue to be the leading nature of injury. Hands and shoulders (19%) were the most common part of body injured. Back injuries were (13%). No eye protection caused two eye injuries. The bar on the right indicates the cumulative rate for fiscal year 2002 through the 3rd Quarter.

* YTD = Year to Date.

WSDOT Ferry Vessel Workers

Recordable Injuries per 100 Workers per Year



Sprains/strains (50%) caused most injuries. Backs (25%) continue to be the most injured part of body. During calendar year 2001, back injuries were 43 (37%) of WSF vessel worker injuries. In calendar year 2001, the 1,098 WSF vessel workers had 146 recordable injuries resulting in 2,828 lost workdays compared to the 148 recordable injuries with 1,776 lost workdays for the other 5,700 employees of the department.

Safety Training Required by Law

Numerous laws and regulations stipulate specific training requirements for many of the activities engaged in by maintenance workers. Last year, WSDOT identified a significant backlog of unmet needs in training and in training record keeping. Maintenance trainers were appointed in each region to address these deficiencies.

There are approximately 14 applicable safety training courses. The following table shows the status of five of the highest priority training topics. The winter quarter is traditionally a light quarter for training activities because of the press of seasonal maintenance efforts. Higher training activity should be seen in the next *Gray Notebook*.

Safety Training Course	Number of Workers Requiring Training	Total Number of Workers Trained to Date	Workers Trained This Quarter	Compliance to Date Target = 90%	Refresher Training Interval	Washington Administrative Code (WAC) Reference
Bloodborne Pathogens	1,257	845	313	67%	1 Year	WAC 296-62-08001
First Aid	1,283	1,066	107	83%	2 Years	WAC 296-24-060
Hearing Conservation	1,163	1,004	0	86%	1 Year	WAC 296-62-09015
Fall Protection	873	174	63	20%	n/a	WAC 296-155-24505
Flagging and Traffic Control	1,024	942	73	92%	3 Years	WAC 263-155-305

Accident Prevention Activities

Quarter 3, Fiscal Year 2002

- Analyzed WSF back injuries and discussed findings.
- Developed specifications for new high-visibility rain clothing, and summer and surveyor safety vests for WSDOT workers.
- Made recommendations to Regional Administrator on accident reporting and review procedures.
- Continued the development of an accident tracking and analysis database.
- Continued providing safety training to employees. In the Northwest Region alone, a total of 1,537 training opportunities for various safety courses were taken by about 500 employees.

Scheduled Activities

April through June 2002

- Conclude WSF back injury study and implement back injury prevention strategies.
- Implement new high-visibility safety garments for summer work and for surveyors, and field the new high-visibility rain gear to improve worker safety.
- Develop and implement new motorist assault rules for compensation of workers struck by vehicles.
- Plan and conduct first annual Work Zone Safety Conference.
- Southwest Region will start a new safety buddy system as an accident reduction strategy.

* See page 31 for information on reading the charts.

Note: Safety statistics for Highway Engineer Workers, that has appeared on this page, will return in the next *Gray Notebook* and will alternate with other safety materials.

Highway Construction Program: Quarterly Update

Meeting WSDOT's Scheduled Advertisement Dates

WSDOT's project delivery schedule, according to the Capital Improvement and Preservation Program (CIPP), is shown on the adjacent chart for the quarter ending March 31, 2002. Of the 79 projects scheduled for bid this quarter, 66 were bid this quarter and 8 were deferred or removed from the CIPP. The deferrals were caused by delays in the scoping, design and preliminary engineering phases of projects. However, owing to the inventory of critical highway construction projects, 2 projects were advanced to help take the place of the 8 deferred projects.

In response to the \$76 million dollar shortfall in the Current Law Budget, the Transportation Commission delayed or deferred a portion of the projects scheduled for bid in Quarter 4. More detail on these project delays and deferrals will be reported in the next Gray Notebook.

Highway Construction Program Cash Flow

Expenditures through the quarter ending March 31, 2002, are on target, achieving approximately 95 percent of budgeted cash flow. The cash flow target for this program is 92 percent to 95 percent. The *Gray Notebook* will continue to publish quarterly updates on cash flow.

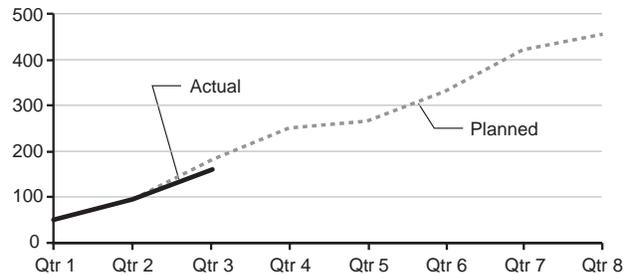
Dollar Value of Projects Advertised and Deferred

This chart shows the dollar value of advertised and deferred projects within the sub-programs of the CIPP during the third quarter. This information is useful for management purposes because it illustrates WSDOT's ability to maximize the delivery of projects to advertisement and planned expenditures. For more specific information about the highway construction program, the CIPP is available at www.wsdot.wa.gov/ppsc/programmanagement/cipp/CIPP_web.htm. In addition, see the "WSDOT Projects" website for projects in the news, under construction, completed, proposed, in design, or being studied at www.wsdot.wa.gov/projects.

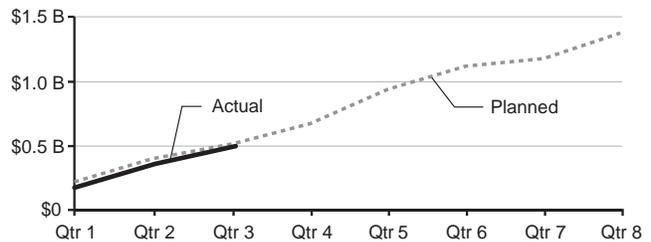
Project Shifting Between Subprograms

As shown in the adjacent chart WSDOT shifts projects between programs and subprograms to ensure a steady flow of projects to ad. It is important to have several projects ready to advance to take the place of deferrals when necessary. This approach helps to maintain overall project delivery schedules.

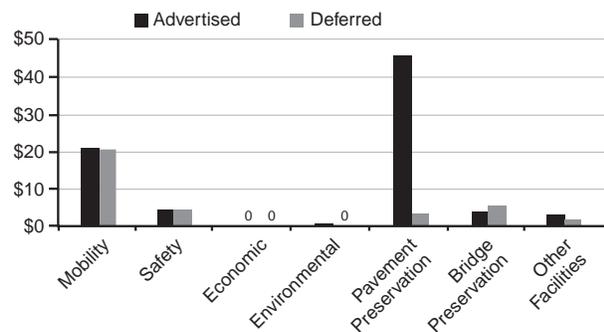
Program Delivery: Number of Actual vs. Planned Advertising Highway Construction Projects
2001-2003 Biennium, Quarter 3 Ending March 31, 2002



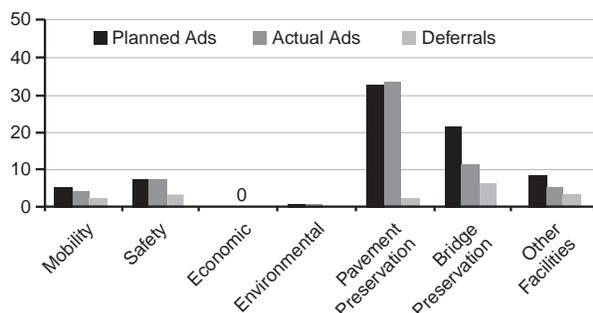
Cash Flow: Planned vs. Actual Expenditures
Dollars in Billions



CIPP Value of Advertised and Deferred Projects by Subprogram
2001-2003 Biennium, Quarter 3 Ending March 31, 2002
Dollars in Millions



Project Shifting Between Subprograms
2001-2003 Biennium, Quarter 3 Ending March 31, 2002



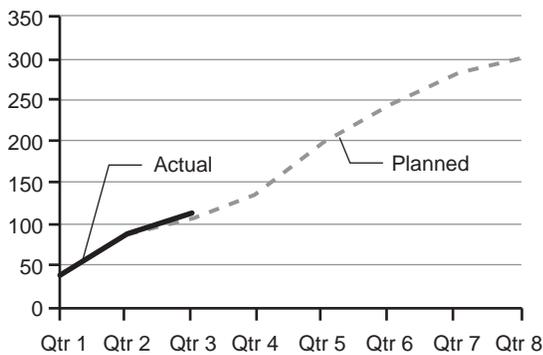
Highway Safety Projects: Quarterly Update

WSDOT has two major programs for the delivery of safety projects. The Safety Construction Program addresses the more expensive and complex safety solutions (*Highway Construction Program Delivery*, see page 2). The Low Cost Safety Enhancement Program delivers projects that provide immediate and sometimes interim improvements to the operational safety and efficiency of the highway system. Examples of some the projects of this type completed in recent months:

- Vancouver: Interstate 5 off ramp to State Route 14 eastbound – Improved warning signs.
- Chattaroy: U.S. 2 at West Moreland Road – Installed cross road warning sign.
- Hoquiam: U.S. 101 – Installed signing and cross walk.
- Tukwila: State Route 518 eastbound ramp to Interstate 5 southbound – Installed warning signs and speed advisory signs.
- Moses Lake: State Route 171 – Signal coordinations at intersections with Ash / Alder / 3rd Streets.
- Snoqualmie Pass: Interstate 90 – Installed winding road signs and chevrons.
- Richland: State Route 240 – Reviewed signal timing and upgraded vehicle detection.

Low Cost Safety Enhancement Projects at High Accident Locations

Number of Projects – 2001-2003 Biennium



New Laws Designed to Improve Safety: Booster Seats for Children and Mandatory Seat Belts for Everyone

Starting on July 1, 2002, Washington State will have the nation's first state Booster Seat Law. The new law requires all children age 4 or 40 pounds to age 6 or 60 pounds to be securely strapped in a booster seat.

According to the National Highway Traffic Safety Administration, belt positioning booster seats are used only about 5 percent of the time. When children in this age and weight group are restrained by only seat belts and not in booster seats, they are 3.5 times more likely to sustain significant injury and 4.2 times more likely to sustain a significant head injury than children using booster seats.



Also on July 1, Washington's mandatory seat belt law will go into effect. National research has found that lap/shoulder safety belts, when used properly, reduce the risk of fatal injury to front-seat passenger car occupants by 45 to 75 percent. Beginning July 1, a driver can be pulled over for a seat belt violation and issued an \$86 fine. The \$86 fine applies to the booster seat law as well.

Based on the experience of states that have adopted primary enforcement seat belt laws, Washington's new seat belt law is expected to save about 34 lives each year and prevent 900 serious injuries.

The Washington Traffic Safety Commission and the Washington State Patrol will work with WSDOT to educate the public and enforce the new law. Look for the new seat belt signs coming soon.

Measuring Congestion

Citizens and businesses in Washington state want to know what is being done to fight congestion on freeways and highways. It's a big problem, because for over 20 years, population, jobs, vehicle registrations, vehicle miles, transit, vanpool, and ferry passenger numbers have grown while the investment in transportation facilities has lagged far behind. The legislature and the public expect WSDOT to measure and report congestion.

Now is the time to take performance measurement for congestion – how the highways are doing and how WSDOT is doing – in a new direction. Therefore, WSDOT is implementing new congestion measurement principles that were adopted by the Transportation Commission's Benchmark Committee in December 2001. These principles will also be used to address the intent of the new Transportation Efficiency Bill passed by the legislature in January.

WSDOT will concentrate particularly on reporting the effectiveness of the congestion relief programs in support of travel time reliability and system efficiency. Travel time reliability is of utmost importance to the public. Some opinion surveys show predictability and reliability are of even greater concern to the public, than the travel time itself.

A significant portion of congestion, and therefore travel time reliability, is effected by unpredictable highway incidents combined with related response and clearance activities. WSDOT's new approach will focus on measuring efficiency, reliability, and progress that the public can see and experience in the short and intermediate term.



WSDOT's Congestion Measurement Principles:

- Use real time measurements (rather than computer models) whenever possible.
- Measure congestion due to incidents as distinct from congestion due to inadequate capacity.
- Show whether reducing congestion from incidents will improve 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 shorter will it be if we improve the interchanges?)
- Use plain English to describe measurements.

Earlier Congestion Measurement Efforts

For years, the public has relied on the Texas Transportation Institute's (TTI) urban mobility report for comparison of national congestion measurements. Each spring, the report repeats two basic conclusions: Traffic congestion is much worse now than in 1982; and traffic congestion is generally worse in larger urban areas than in smaller urban areas. In many cases, improvements in roadway performance (the efficient movement of more cars, for example by ramp metering) actually end up being reported by TTI as increases in congestion. This is because the TTI methodology does not fully measure many of the most important specific strategies or solutions, such as signal timing coordination, incident response, or other operation improvements.

WSDOT and other transportation agencies around the country are implementing new programs to clear roadway incidents to reduce the huge burden of "non-recurrent" congestion. Federal Highway Administration studies show that non-recurrent congestion can cause a large portion of urban congestion, especially the long, unexpected backups that most aggravate traders and shippers. But programs designed to reduce these impacts are not reflected in the TTI report in its current methodology. These measures, and others shown on the right, must now be reassessed for their usefulness in WSDOT's new approach.

Previous *Gray Notebooks* (June 2001) reports featured the following congestion and delay indicators:

- **Travel Rate Index** (based on TTI) for the years 1993-1999 for the urban interstate system, the urban non-interstate system, and rural highways.
- **Daily Vehicle Hours of Delay per Mile** for the years 1993-1999 for the same three highway subsets.
- **Map of 228 Highway Miles of Severe Congestion** in segments where TRI exceeds the national average of 1.3 calculated by Texas Transportation Institute.
- **Five Popular Commutes:** TRI and Daily Vehicle Hours of Delay per Mile.
- **Distribution of Delay** on Urban Interstates and Urban Non-Interstates by Time of Day.
- **Annual Volumes of WSDOT Incident Response Calls.**
- **Tracking measures of incident response time and average incident clearance time** (*Gray Notebook*, September 2001).

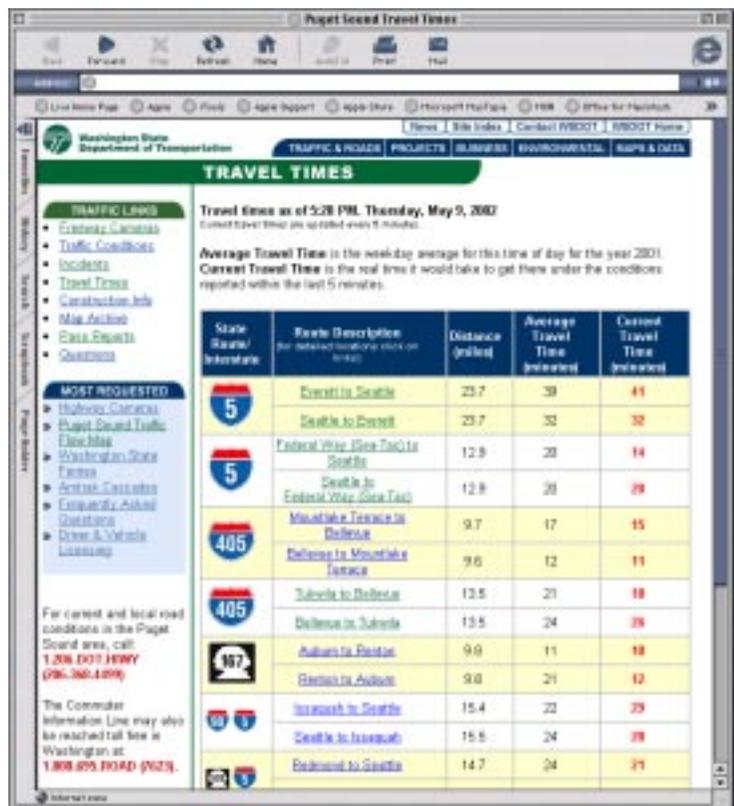
Step 1: Real Travel Times You Can Use – Right Now

One of the first elements of WSDOT's new congestion measurement approach is the roll-out on May 15 of our new website report of real travel times. These active real travel times are updated every 5 minutes in order to provide travelers with up-to-the-minute information for some of the most congested corridors in the Puget Sound region. This data is collected utilizing in pavement loop detectors, leveraging our existing intelligent transportation system (ITS) investments.

Measuring and managing freeway traffic requires data, and lots of it. Loop detectors are the most common technology used on freeways and arterial roadways to collect real-time data on traffic flow. The equipment and technology has been in place for decades and is the mainstay of the operation of traffic signals and the freeway management system.

In Future *Gray Notebooks*...

More measures will be coming. New ground is being broken here. WSDOT is turning to the University of Washington, among others, for technical assistance and guidance in developing new measures. This level of attention to the congestion measurement problem is matched around the country. In fact, many of the states that historically have sponsored the TTI research are now, like Washington, feeling the need for new types of information. As states experiment with new solutions and share their results, new opportunities to benchmark against the real problems and progress of other communities around the country will grow.



This preview of WSDOT's new Travel Times web site, is coming May 15, 2002, at www.wsdot.wa.gov/pugetsoundtraffic/traveltimes/. As data is gathered, "roll-up" summaries will be included in future *Gray Notebooks*.

Induction Loop Detectors

Loop technology is based on running an electric current through a wire embedded in the pavement, which creates a magnetic field. When a vehicle passes over the loop, the magnetic field is disrupted. An electronic device measures the change, and logs the presence of a vehicle.

Loops provide two basic measurements: vehicle count and how long the vehicle occupies the loop. This data is then used to estimate vehicle speed. Speed estimation using single loops is accurate to 5 or 10 mph in free-flow steady speed conditions. Error in the measurement can be introduced when gaps between vehicles are extremely small, where there is excessive lane changing over the loops or when traffic remains stopped over the loop for a long duration. To compensate for this variability, WSDOT has installed "speed stations" (double loops) at about 100 locations in the freeway system to achieve greater accuracy.



crew installing loops for a permanent traffic recorder to collect continuous traffic data on SR 16 near Burley.

Speed stations eliminate the need to approximate vehicle length and provide speed estimates with greater accuracy. These stations provide accuracy to within 1 or 2 mph at high speeds.

At any given time, approximately 8% of the freeway loops are flagged as unusable. Filters in WSDOT's software monitor the system to detect failures, exclude bad data, and support the level of accuracy that is needed for traffic management and for reporting traffic conditions to the public.

The measurements from the speed stations and single loop detectors feed WSDOT's traveler information website, are used to adjust ramp meter timing on Washington freeways and inform traffic managers about conditions on the freeway system. Washington's use of highway traffic management systems is among the most advanced in the country.

Washington State Ties With Average U.S. Commute Travel Times

Recently released U.S. Census Bureau 2000 data shows Washington state in 11th place for average commute times, and in a virtual statistical dead heat with the U.S. average and with six other states (Florida, New Hampshire, Hawaii, Louisiana, Pennsylvania, and Arizona). In 1990, Washington state ranked 13th with an average travel time to work of 22 minutes, slightly less than the then-U.S. average of 22.4 minutes. For this U.S. Census Bureau data, see this website: www.census.gov/c2ss/www/Products/Rank/RankTT040.htm

Average Travel Time to Work: State Ranking

In minutes

State	Average	State	Average	State	Average
New York	31.2	Texas	23.6	Maine	21.2
Maryland	29.1	Connecticut	23.5	Vermont	21.1
New Jersey	28.7	Colorado	23.4	Utah	20.9
Dist. of Columbia	28.5	Missouri	23.2	Wisconsin	20.1
Illinois	27.1	Tennessee	22.8	New Mexico	19.9
California	26.7	Michigan	22.7	Arkansas	19.7
Georgia	26.7	North Carolina	22.6	Idaho	19.7
Massachusetts	26.1	Alabama	22.5	Oklahoma	19.6
West Virginia	25.5	Delaware	22.5	Alaska	18.2
Virginia	25.4	Kentucky	22.5	Kansas	17.7
Washington	24.9	Nevada	22.3	Iowa	17.6
United States	24.3	Ohio	22.1	Wyoming	17.1
Florida	24.3	Mississippi	21.9	Nebraska	16.1
New Hampshire	24.3	Rhode Island	21.9	Montana	16.0
Hawaii	24.2	South Carolina	21.9	South Dakota	15.6
Louisiana	23.8	Indiana	21.7	North Dakota	15.4
Pennsylvania	23.8	Minnesota	21.6		
Arizona	23.7	Oregon	21.4		

Source: U.S. Census Bureau, Census 2000 Supplementary Survey

Average Travel Time to Work: County Ranking

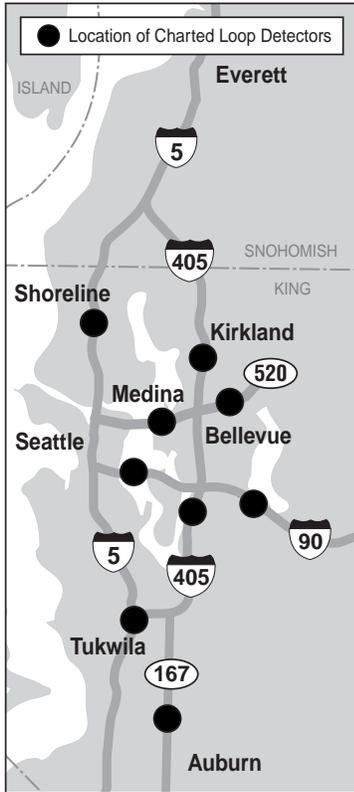
In minutes, a sampling of the 216 counties reported

Rank	County	Average	Rank	County	Average
1.	Richmond County, NY	43.9	61.	Northampton County, PA	26.5
2.	Kings County, NY	42.4	62. King County, WA	26.4	
3.	Queens County, NY	41.0	63.	Fairfield County, CT	26.3
4.	Bronx County, NY	40.1	66.	Orange County, CA	26.2
5.	Prince William County, VA	38.4			
6.	Prince George's County, MD	34.7	103.	Clackamas County, OR	24.4
7.	Nassau County, NY	34.5	105. Clark County, WA	24.3	
8.	Contra Costa County, CA	34.4	117.	Multnomah County, OR	23.6
9.	Westchester County, NY	32.5			
10.	Ocean County, NJ	32.2	193.	Ada County, ID	19.3
			195. Spokane County, WA	19.3	
47.	Los Angeles County, CA	28.0			
48.	Anoka County, MN	28.0	215.	Sedgwick County, KS	17.0
49. Pierce County, WA	28.0	216.	Polk County, IA	16.5	
50.	Baltimore city, MD	27.7			
51.	Rockingham County, NH	27.7			
52. Snohomish County, WA	27.7				
53.	Middlesex County, MA	27.6			

Source: U.S. Census Bureau, Census 2000 Supplementary Survey

Traffic Volumes on Nine Puget Sound Region Corridors

Using data gathered from highway loop detectors, here are the weekday vehicle traffic volumes for nine corridors comparing January-February-March 2001 to 2002.

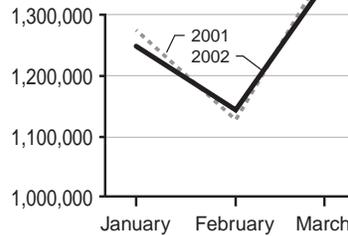


These numbers are taken from traffic counts that include a margin of error that raises questions about the use of the data in precise analysis of traffic trends, for example, in relation to employment statistics. But some indications in the numbers attract comment:

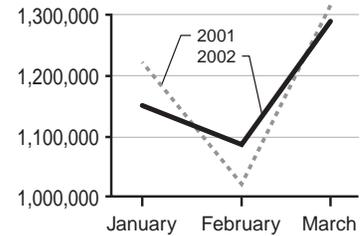
- The data shows higher traffic volumes for March compared to February for 2001 and 2002. In part, this factors in the 17 weekdays vs. 20 weekdays in these months of data.

Continued on next page.

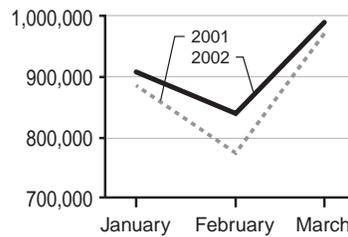
Interstate 90 – Westbound
@ Floating Bridge Midspan



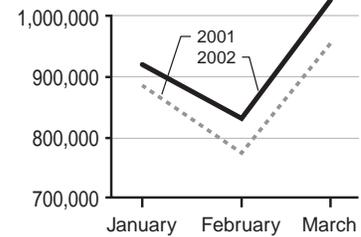
Interstate 90 – Eastbound
@ Floating Bridge Midspan



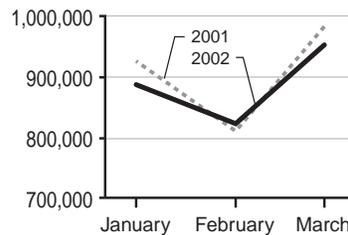
Interstate 90 – Westbound
@ West Lk Sammamish Pkwy – Bellevue



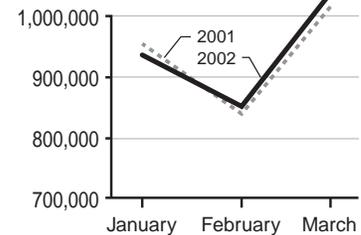
Interstate 90 – Eastbound
@ West Lk Sammamish Pkwy – Bellevue



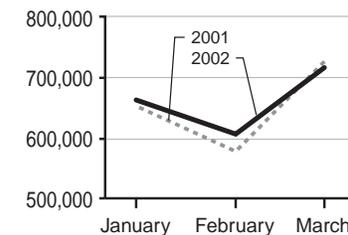
State Route 520 – Westbound
@ 84th Avenue NE – Medina/Clyde Hill



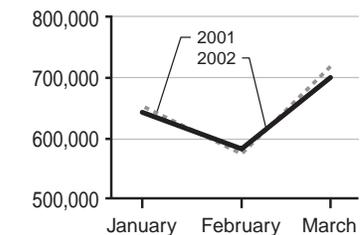
State Route 520 – Eastbound
@ 84th Avenue NE – Medina/Clyde Hill



State Route 520 – Westbound
@ 148th Avenue NE – Bellevue/Redmond



State Route 520 – Eastbound
@ 148th Avenue NE – Bellevue/Redmond

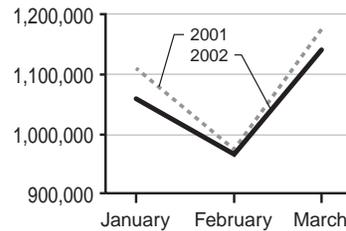


Traffic Volumes on Nine Puget Sound Region Corridors

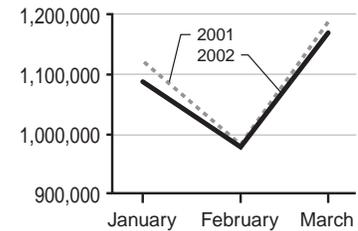
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- It may be premature to interpret these limited traffic volume data in context of the recent economic slow down. Despite interesting variations from route to route, overall, the 2002 volumes seem to be slightly lower or equal to 2001 volumes.
- There is one obvious exception on Interstate 90 east and west bound, at West Lake Sammamish Parkway: Data shows higher volumes for 2002 on this highway segment. This may not be surprising in light of the concentrated housing growth in this area. It is interesting to note that the higher volumes do not seem to extend across the Lake Washington floating bridge (see "Interstate 90, west and east bound, Floating Bridge Midspan" on page 7).
- A slight increase in volume from 2001 to 2002 on State Route 167 is noticeable. This could be due to continuing population growth in the greater Auburn area.

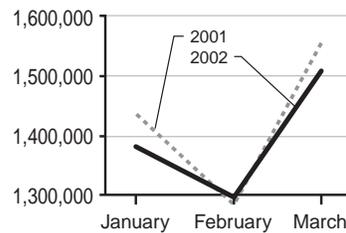
Interstate 405 – Northbound
@ SE 59th Street – Bellevue



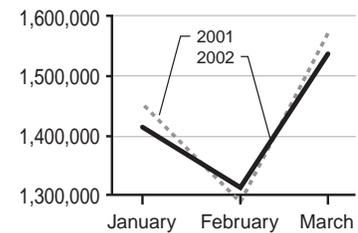
Interstate 405 – Southbound
@ SE 59th Street – Bellevue



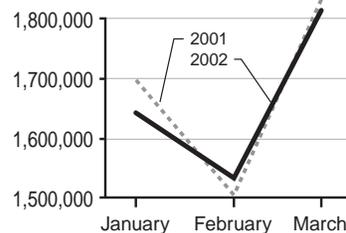
Interstate 405 – Northbound
@NE 72nd Street – Kirkland



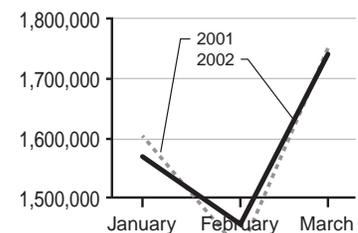
Interstate 405 – Southbound
@NE 72nd Street – Kirkland



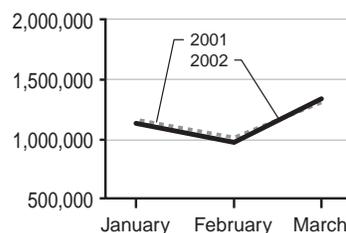
Interstate 5 – Northbound
@NE 145th Street – Shoreline



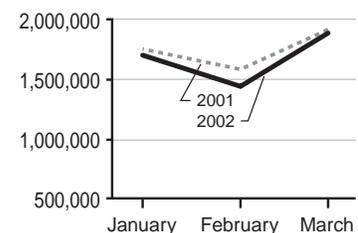
Interstate 5 – Southbound
@NE 145th Street – Shoreline



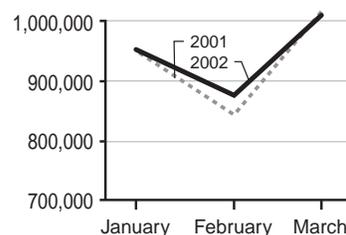
Interstate 5 – Northbound
@ Interstate 405 – Southcenter/Tukwila



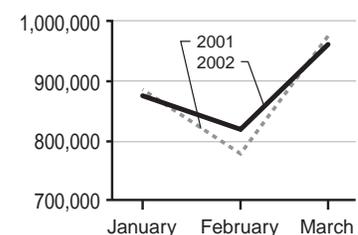
Interstate 5 – Southbound
@ Interstate 405 – Southcenter/Tukwila



State Route 167 – Northbound
@South 277th Street – Auburn



State Route 167 – Southbound
@South 277th Street – Auburn



Incident Response Teams: Quarterly Update

Incident Response Teams

Non-recurring traffic incidents are a significant factor in freeway congestion, especially in urban areas. One of WSDOT's strategies to address congestion is to quickly clear incidents. Incident Response Teams and the new service patrols are reducing non-recurring congestion and travel times for the public.

The 2002 average response times have improved due to the addition of several roving Service Patrols in the Spokane and Seattle areas.

Spokane I-90 Peak Hour Roving Service Patrol Experiment

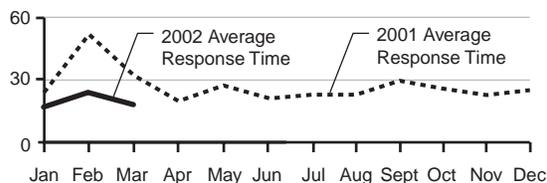
WSDOT began roving Service Patrols for peak hours on 20 miles of Interstate 90 in the Spokane area in November 2001. Previously, incident response only went out after calls had been received. By January 2002, it appears that roving patrols have led to doubling of encounters to assist stranded motorists, remove highway debris, or aid in other highway incidents. Average times for incident response showed major reductions, as shown in the chart to the right.

Roving response teams promote better coordination with the efforts of the State Patrol:

"The general consensus is overwhelmingly and uncommonly positive. It seems clear that this is a great program that deserves whatever support can be provided it." – Lt. Steve Turcott, WSP

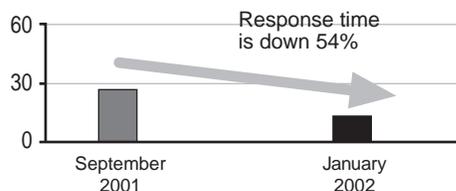
Note: Please see the related special feature on the new "Steer It, Clear It" law, WSDOT and WSP's new Operations Initiative (see page 29). The Service Patrol contacts and clearance time statistics that have appeared on this page will return in the next *Gray Notebook*.

Response Time for the WSDOT Incident Response Teams Statewide
In minutes, 2002 vs. 2001



Average response time is the average elapsed time from when an Incident Response Team received a call to when that team arrived on the scene.

Spokane I-90 Peak Hour Roving Service Patrol Experiment: Faster Response Times
Time in minutes



Gold Medal Performance by Washington's Incident Response Teams at the 2002 Winter Olympic Games

The Salt Lake 2002 Winter Olympics Incident Management Team invited three roadway Incident Response Teams from across the country to assist Utah's Department of Transportation. Washington, Illinois and Tennessee were the "top of the crop" invited to help at the games.

The unique transportation problems presented by the Olympics was challenging for the nine-member WSDOT team operating two response trucks and a tow truck. It was both an occasion to share WSDOT's expertise and an opportunity to gain valuable new experience in world-class event planning and incident management.

WSDOT was asked to take up some of the most sensitive traffic duties. These included looking out for a couple of very important people – President Bush and Vice President Cheney. Due to heightened security, no vehicles were allowed to be parked along the presidential route. The WSDOT team risked potential danger by patrolling in advance of the presidential motorcades and quickly towing all vehicles parked along the route.

WSDOT was assigned another challenge: the traffic tangle at the cross country skiing venue at Soldier Hollow. Event parking, adjacent to a highway carrying large traffic volume, was causing a traffic nightmare,

including many collisions. Following WSDOT's team deployment, not a single collision occurred and the traffic flow improved dramatically.



SALT LAKE 2002



Numerous lessons learned from working with the event team are now being incorporated in practice here in Washington state. Taxpayers will also be pleased that the entire cost of this assignment, including salaries, fuel, and vehicle rental, were reimbursed to WSDOT by the Olympics.



A WSDOT Incident Response Team in action at the Olympics.

Highway Maintenance: Litter Control

Approximately 1,200 tons of litter and debris are removed from highways, shoulders and roadsides every year. This is roughly equal to twenty-four filled litter bags per mile of highway every year. The litter



A volunteer fills a litter bag.

ranges from soda pop cans to discarded Christmas trees and old sofas that never made it to the landfill. Over 1,600 volunteer *Adopt-A-Highway* groups, as well as the Department of Ecology Youth Corps and Department of Corrections work crews (*see right*), pick up most of the conventional litter (i.e. plastic bags, beverage containers, etc.)

from the roadside. In Ecology's Eastern Region,

Youth Corps members picked up 66 percent more litter in 2001 than 1999. WSDOT maintenance crews remove larger debris on the roadway and shoulders where safety is a primary concern.

The **State Department of Corrections** fields three work crews for roadside litter removal and their work is scheduled to fill in the gaps between litter pickups conducted by the *Adopt-A-Highway* groups and Ecology Youth Corps. Various county and city corrections work crews are used in a similar manner. Corrections crews are comprised of both work-release persons as well as individuals completing community service requirements.

Statewide Anti-Litter Campaign to Start

On April 29th, the Department of Ecology kicked off a statewide anti-litter campaign titled "*Litter and it will hurt*" using television and radio spots and a toll-free number set up to report litter law violations. WSDOT has installed 138 new road signs to support the campaign.



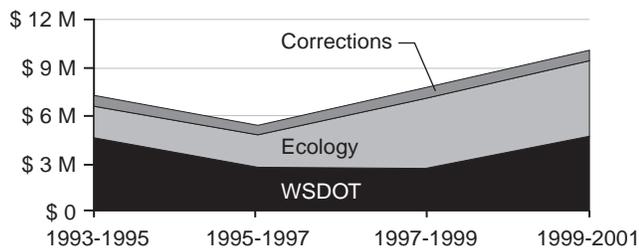
Littering Violations and Penalties*

- Littering lighted debris (e.g., cigarette butt) – \$950.
- No litterbag – \$95.
- Littering an amount less than or equal to 1 cubic foot – \$95.
- Littering an amount greater than a cubic foot but less than a cubic yard – Up to \$1000 and up to 90 days in jail (misdemeanor).
- Littering an amount greater than a cubic yard – Up to \$5000 and up to 1 year in jail (gross misdemeanor).
- Failure to secure load – \$171 (traffic infraction).
- Throwing dangerous materials on the roadway – \$171 (traffic infraction).

*Fines per Revised Code of Washington and the Administrative Office of the Courts.

Trends in Statewide Highway Roadside Litter Removal Costs

Dollars in Millions



Note: The Department of Corrections gets its funding from both Ecology (\$350,000) and WSDOT (\$250,000).

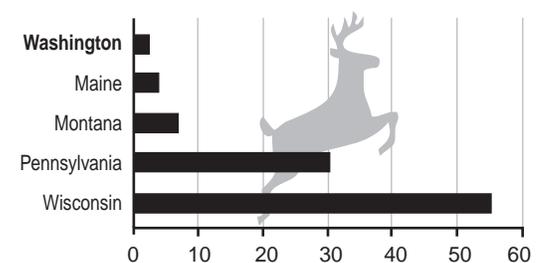
Minimizing Road Kill

Expenditures for road kill removal and disposal comprise about 20% of WSDOT's litter cleanup budget. About 2,500 to 3,000 deer are hit on Washington state highways each year. Efforts are being taken to reduce these numbers. Fencing, specialized roadside reflectors, wildlife under-crossings, and flashing signs that warn motorists when large animals are near the highway are some of the measures that WSDOT has taken to make the highways safer for travelers of all species. Additional safety and cost-saving strategies will be considered.

Other states also have to deal with road kill on their highways. Here is a sampling from other states:

Road Kill on State Highways

Thousands of Deer



Innovative Maintenance Solutions: Please see "Special Features" story on "*No – it's not roadside art...*" on page 28.

Note: Updates on pavement striping and repairs of sign bridges previously featured on this page will be provided in the next *Gray Notebook*.

Highway Maintenance: Integrated Vegetation Management

Vegetation management for WSDOT's 100,000 acres of roadside must meet operational, safety, environmental and aesthetic objectives. Management techniques include soils amendment, planting, hand weeding, mowing, tree maintenance and herbicide application. Herbicide use is a sensitive issue for many citizens, drawing special attention to the importance of Integrated Vegetation Management (IVM).

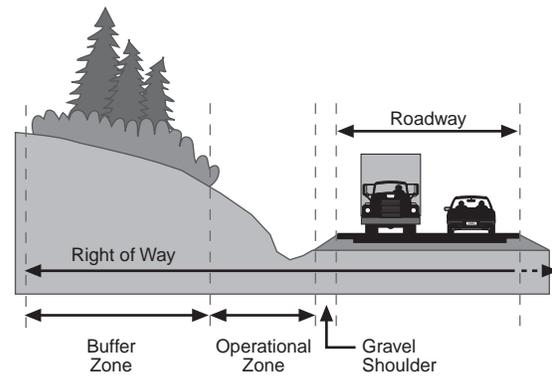
Objectives at the roadside include:

- Managing the immediate shoulder for use as a reconrol zone for errant vehicles and inhibit weeds from growing into the pavement.
- Preserving sight distances for reading signs and for cornering.
- Screening on-coming traffic on divided highways.
- Maintaining slope stability, encouraging drainage of water off the roadway, protecting water quality, protecting habitat for wildlife and preserving or restoring native plant communities.
- Protecting roadside areas against infestation and spread of noxious weeds.
- Keeping vegetation back from the edge of the road to improve visibility of wildlife and reduce chance of road kill.

How does IVM help manage the roadside to better operational and environmental outcomes?

IVM teaches and demonstrates that the aims of roadside vegetation management can be achieved through techniques that encourage self-sustaining native plant communities to naturally discourage the establishment of unwanted plant species. IVM starts with good soils management, planting design, and revegetation, and then recognizes proper mowing (or *not* mowing), weeding, pruning and thinning. Herbicide use cannot be ruled out, but other strategies working together seek to limit its necessity. In addition, as IVM strategies take hold over time, mature roadside plant envi-

How and Why WSDOT Manages Roadside Vegetation



Gravel Shoulder – Vegetation Free Area

Maintained with herbicides where necessary to allow surface water drainage off the pavement and into the ditch.

Operational Zone – Grass or Small Trees and Shrubs

Maintained through mowing to allow for visibility of signs and traffic at interchanges and curves. Large trees are also removed for safety in case vehicles accidentally leave the road. Herbicides are used very selectively for control of noxious weeds, and sometimes for brush control.

Buffer Zone – Natural/Native Vegetation

Wherever possible the roadside is designed and maintained as native and/or low maintenance vegetation. The IVM approach encourages stable self-sustaining vegetation with limited use of mowing, herbicides, tree removal and other methods as necessary.

ronments lead to long-term herbicide use reductions. Finally, IVM stresses the need for selectivity, restraint and proper training and protections whenever herbicides must be used.

Why use herbicides at all?

On the shoulder, many kinds of vegetation growth can work against the safety and operational requirements of this zone. On the shoulder and in other zones, too, noxious weeds (such as knapweeds, thistles, and tansy) must be controlled to protect against undesirable succession of plant communities, not only for the sake of the roadside zone itself, but also to prevent the roadside from becoming a refuge for invasive species in the broader ecological geography. Herbicides have conventionally allowed the effective and seemingly inexpensive achievement of these goals. But many citizens are concerned that the “cost” of herbicide use in today’s ecologically attuned world may be more expensive than once thought. Use of herbicides, WSDOT recognizes, should be minimized.

Overall Trends in WSDOT Herbicide Use

Over the last decade, WSDOT's overall pesticide use has dropped in the locations where IVM has been implemented.

A data base was established in 1995 for recording statewide herbicide use. The data since then shows significant fluctuations from year to year. Budget constraints have been a significant feature in some years, leading to following-year jumps in applications to "catch-up" in areas where under-management caused concern especially about loss of control of noxious species. Year-to-year variations in rainfall and growth also play a role. In some instances newer products are taking the place of old ones. For example, in Eastern Washington, 2,4-D based products are being used less because of the risk of damage to wine grapes. The use of applications with invert oil also reduces the rates of herbicide per acre and reduces the chance of off target damage.

WSDOT expects to collect more detailed information on herbicide use and implementation of IVM in the 2002 spraying season and present results in the *Gray Notebook* for the quarter ending December 31, 2002. The information will be presented with an expanded section containing toxicological information on particular active ingredients.

Computer Controlled Spraying



In recent years WSDOT has invested in truck-mounted application units used for applying anti-icing materials in winter months, and herbicides during the growing seasons. These units are computer controlled to improve precision, efficiency and effectiveness of herbicide applications. Applications can be made with lower rates per acre and less potential to drift through the use of "invert," an organic oil which encapsulates herbicide droplets.

All WSDOT employees making herbicide applications have been specially trained and licensed by the Washington State Department of Agriculture under state and federal regulatory requirements. These employees receive annual training and recertification for their expertise. WSDOT employs over 250 individuals certified for herbicide application.

Major Herbicide Products: Overall Usage Trends

Pounds of Active Ingredient Applied

	Products Used	Concerns with Use	Trends and Fluctuations
<p>Gravel Shoulder Maintenance</p>	Generally non-selective products. Major products are: Roundup, Diuron, Krovar, and Oust	Applications must be made under proper weather conditions. Movement off target can result from high wind and rainfall.	A policy change was implemented in 1994-95 to decrease the maintained width of this area. Use has been relatively stable since that time with some variation due to budget constraints.
<p>Noxious Weed Control</p>	Selective control of weed species. Major products include: Weedar 64, Weedmaster, Veteran 720, Vengeance and Telar	Some of these products contain 2,4-D which can move off target if temperatures exceed the labeled limits. Small amounts of 2,4-D have been known to cause damage to certain crops including grapes.	Use of 2,4-D products is decreasing in Eastern Washington in response to concerns the wine grape industry. Other newer products such as Telar have increased in use by replacing 2,4-D products.
<p>Tree and Brush Control</p>	Herbicides applied to selectively control unwanted trees and brush. Major products used include: Garlon, Banvel and Escort	Use of these products in the spring and summer may result in an undesirable visual effect referred to as "brown out". Applications are typically made in the late summer and fall to avoid this.	Overall use of these products is down. Many of these operations can also be accomplished through techniques encouraged through IVM, such as mechanical mowing and trimming.

Data compiled for this graph includes the major products used by WSDOT between 1994 and 2001. The product use shown accounts for approximately 90% of total use.

Walla Walla Case Study

Over the last five years maintenance crews in Walla Walla have recovered sections of weed infested roadside through seeding and fertilization program to encourage desirable grasses. This approach has resulted in less weeds on the roadside and a reduction in herbicide use. In fact, the cost of herbicides used on about 50 acres of roadside in 2001 was about \$500 compared to about \$4,000 in 1998.



Before and After: From weed infestation to grass stand on U.S. 12 near Walla Walla.

Mount Vernon Case Study

In the Mount Vernon area, segments of I-5 include large areas of right of way which once were maintained as a grassy area through routine mowing twice a year. For the past four years maintenance has planted trees to re-establish native forest canopy on the roadside outside the highway operational and safety zone. In time these areas will be left to grow naturally without mowing or herbicide use.

IVM Implementation on the I-5 Corridor

Another pilot project was started this year. A Roadside Vegetation Management Plan is being developed to implement site specific IVM decisions and actions throughout the Interstate 5 corridor in western Washington. Beginning this year, you will see consistent mowing operations throughout the corridor, from Vancouver to Bellingham. Over the next several years, WSDOT will be systematically removing stands of scotch broom and blackberries, and creating areas of stable grass stands and native vegetation.



Interstate 5 north of the Stillaguamish River.

Environmentally Sensitive Areas

WSDOT is taking extra precautions with herbicides near open water, wetlands, or near wellhead protection zones. Maintenance crews have been marking areas with green guideposts and pink fish stickers on highways that are adjacent to open water or wetlands. WSDOT staff work to identify sensitive areas and assist with permitting, training, and implementing best management practices in order to minimize adverse effects on the environment.



The green guidepost, marked with a pink fish sticker, designates this section of highway (State Route 504, in this case) as being adjacent to open water.

Posting and Notification for Herbicide Applications

Because some citizens are personally very concerned about the possibility of herbicide exposure, WSDOT posts notification of application and contact information at public access facilities such as Safety Rest Areas and bicycle trails. WSDOT spray trucks are



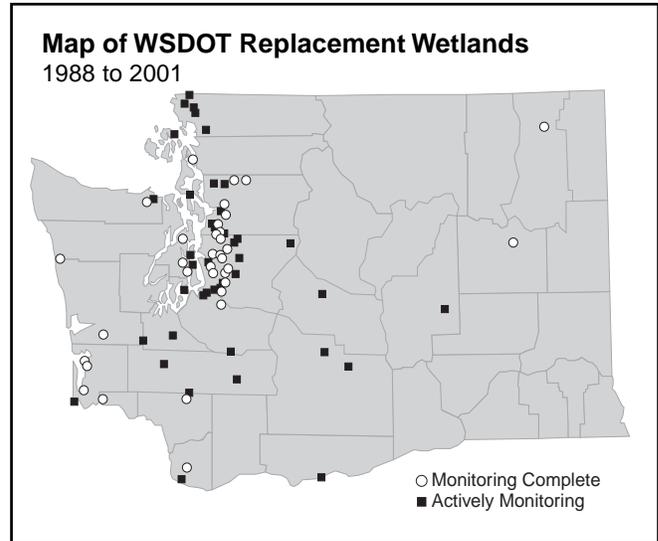
Yellow flags identify posted herbicide use in public areas.

clearly marked with prominently displayed contact information as well. Statewide, the agency notified 50 individuals last year who are either on the state list for multiple chemical sensitivity, own and operate organic farms near a highway, or are otherwise concerned about the use of herbicides. There are also more than 150 locations around the state with agreements that herbicides not be

applied if a roadside neighbor assumes the maintenance responsibility.

Environment: Monitoring Replacement Wetlands

WSDOT has been mitigating unavoidable wetlands loss with replacement wetlands for well over a decade. Monitoring and reporting on the status of replacement wetlands is critical to the success of the program as seen through the eyes of both the public and the resource protection agencies with whom agreement on these projects must be reached.



WSDOT Replacement Wetlands

1988 to 2001

- Total number of replacement wetland projects:
96 projects
- Total acreage of wetland projects:
460 acres

Restoration

Re-establishes a wetland area and/or function, where wetlands previously existed but are no longer present.

56 Total Acres



Schel-chelb estuary mitigation site on Bainbridge Island.

Preservation

Protecting wetlands from future development insures that valuable wetland functions continue to provide benefits.

117 Total Acres



U.S. 101 Queets mitigation site.

Creation

The establishment of wetland area and functions, where none previously existed.

114 Total Acres



U.S. 101 North River mitigation site.

Enhancement

Improvements to an existing degraded wetland to increase or augment wetland function.

85 Total Acres



A coot at the SR 500 Andreson Road mitigation site.

Buffer

An upland area that protects a wetland from adverse impacts.

88 Total Acres



SR 509 Erdahl Ditch mitigation site.

Standards for Evaluating Replacement Wetlands

Setting interim and final success standards for replacement wetlands is an integral part of the wetlands permitting process between WSDOT, Department of Ecology, Department of Fish and Wildlife, the U.S. Army Corps of Engineers, cities, and counties.

The most common standards include:

- Water presence and saturated soil conditions.
- Vegetation characteristics, especially for native plant species.
- Wildlife habitat diversity.

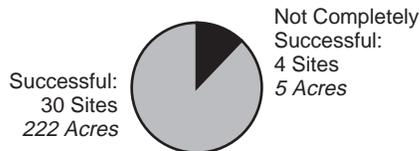
In 2000 and 2001, biologists monitored 62 WSDOT project sites ranging from one to eight years in age. Monitoring was conducted for 240 individual measurable standards.

What are WSDOT's "Success Standards?"

Establishing effective *success standards* is difficult. Standards need to be measurable, achievable and meaningful. Mitigation sites are carefully planned and constructed, but they also rely on complex natural processes for the site to fully develop. For example, success standards may require certain plant cover by a specific year (e.g. 20% cover by woody vegetation or less than 10% cover by invasive species by year three). Over ten years experience has taught that some standards are not feasible even for very promising sites. WSDOT continues to refine approaches to wetland mitigation and is conducting research on older mitigation sites to help provide a scientific basis on how to determine the most appropriate success standards.

Replacement Wetlands: Monitoring Complete

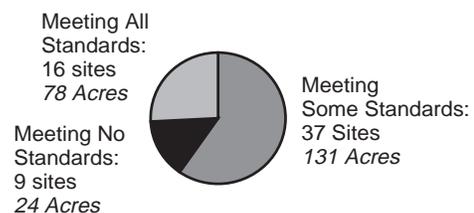
1988-2001: Total Number of Sites: 34



"Successful" = these sites have met their regulatory requirements
 "Not completely successful" = these sites have yet to meet requirements and plans are needed to ensure effective wetland replacement.

Replacement Wetlands: Sites Still in Monitoring

2000-2001: Total Number of Sites: 62



A site meeting its Success Standards

The 1.03 acre May Valley South mitigation site on SR 900 in King County has met its success standards that include:

- Shrub cover.
- Forest cover.
- Area of stream shaded by vegetation.
- Area of stream buffer created.
- Area of forest created.



Site has successfully completed five-year monitoring cycle.

A site needing more work to meet its Success Standards

The 7 acre Battle Ground Center mitigation site in Clark County (on SR 503) is failing to meet standards for tree cover in the forested and scrub-shrub zones due to disturbances to wetland plantings, by flooding, and unauthorized vehicle use of the site. WSDOT is taking corrective action by:

- Installing protective fencing.
- Weeding.
- Replanting the site using native plants.



A new fence and gate was installed to prevent unauthorized vehicle use of the site.

A recent and widely reported Department of Ecology study, *Washington State Wetland Mitigation Evaluation Study Phase 2: Evaluating Success, 2002*, studies 24 wetlands replacement projects in the state including **no** WSDOT projects. For those sites, the Ecology study found significantly lower success rates than have been achieved at WSDOT project sites. The findings of the study reinforce the need for intensive monitoring and follow-through if the kind of success rates achieved by the WSDOT projects are to be matched in other programs.

WSDOT reports exhaustively on its replacement wetlands mitigation programs, which are among the most comprehensive in the country. Visit WSDOT's 1999 *Success Standards for Wetland Mitigation Projects – A Guideline* at www.wsdot.wa.gov/eesc/environmental/programs/biology/docs/success.html.doc, and view annual wetland monitoring reports at www.wsdot.wa.gov/eesc/environmental/programs/wetmon/wetmon.htm

Bridge Assessment Program: Quarterly Update

WSDOT Bridge Inventory

December 30, 2001

Bridge Type	Quantity	Area (sq ft)
Pedestrian Bridges	61	251,790
Railroad Bridges	11	65,746
Buildings or plazas	1	na
Structures < 20 feet in length	200	39,770
Culverts > 20 feet in length	69	37,840
Tunnels	34	566,999
Vehicular Bridges > 20 feet	2,991	45,475,040
Total WSDOT Bridges	3,367	46,437,185

Bridge specialists at WSDOT are also involved in tunnels, sign bridges, and other ancillary highway structures. These matters will be covered in future Gray Notebook reports.

The WSDOT Bridge Assessment Program consists of four main program areas:

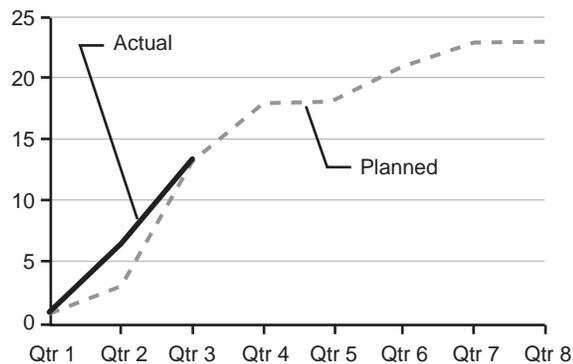
- **Inspection.** Inspect one-half of all WSDOT bridges every year.
- **Repair, rehabilitation, and replacement.** Remedy for deterioration and traffic impacts. Rehabilitation of mechanical and electrical operating systems on movable bridges.
- **Preservation.** Extend bridge service life such as painting of steel structures, overlays of bridge decks, replacement of floating bridge anchor cables.
- **Risk reduction.** Special efforts directed to seismic and flood risk.

Preservation: Steel Bridge Painting

The cumulative award of approximately 25 steel painting projects scheduled for the 2001-2003 biennium is shown in the accompanying chart, updated from December 31, 2001.

2001-2003 Bridge Painting Projects

Number of Bridges

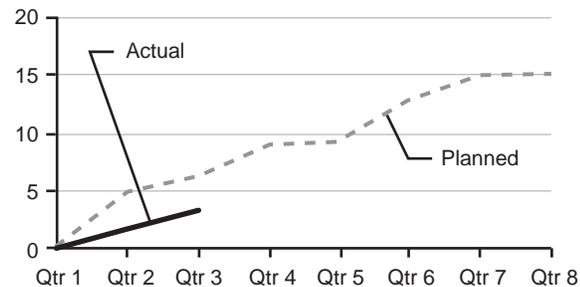


Preservation: Bridge Deck Protection

Update of the December 31, 2001, chart:

2001-2003 Deck Protection Projects

Number of Bridges



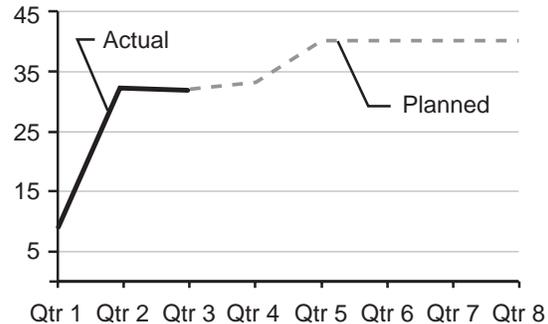
Two bridge projects were deferred due to traffic control concerns. A joint bridge project with Idaho DOT was deferred because Idaho's funding was not available this quarter.

Risk Reduction: Seismic

Scheduled for award in each quarter of the 2001-2003 biennium, updated from December 31, 2001.

2001-2003 Bridge Seismic Retrofit Program

Number of Scheduled Bridges



Bridge painting also requires protecting the environment, as seen on State Route 17's Columbia River Bridge near Bridgeport. The bridge is located just downstream from Chief Joseph Dam.

Commute Trip Reduction: Quarterly Update

Vanpools in the Puget Sound Region

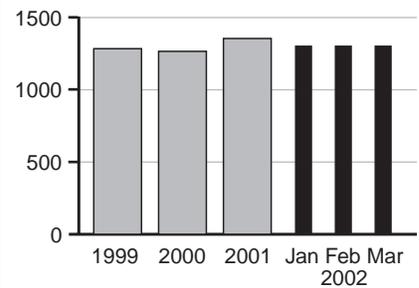
The number of vanpools on the road in the Puget Sound region has remained flat since October 2001. Most of the operators have fewer vans on the road except for Kitsap County (up 20 percent) and King County with significant growth in the *VanShare* program.



Quarterly Regional Vanpool Highlights

- King County Metro located 30 vans at Sounder stations. These *VanShare* vehicles provide a key multi-modal link by connecting commuters with their employment locations.
- Kitsap Transit and King County Metro established the first multi-modal *VanShare* connection with WSF. The commuters ride a Kitsap Transit van to the Southworth ferry terminal and then continue on a King County Metro van from Fauntleroy ferry terminal for the remainder of their commute in the Seattle area.
- Community Transit and WSDOT have incorporated vanpool services as part of the traffic management effort for the SR 529 bridge construction work near Marysville this summer.
- Because the Boeing Company is shifting many of its 777 worker start times outside of transit operating hours, King County Metro, Community Transit, and Island Transit have been working with Boeing to meet employee needs with vanpool/carpool services.

Number of Operating Vans

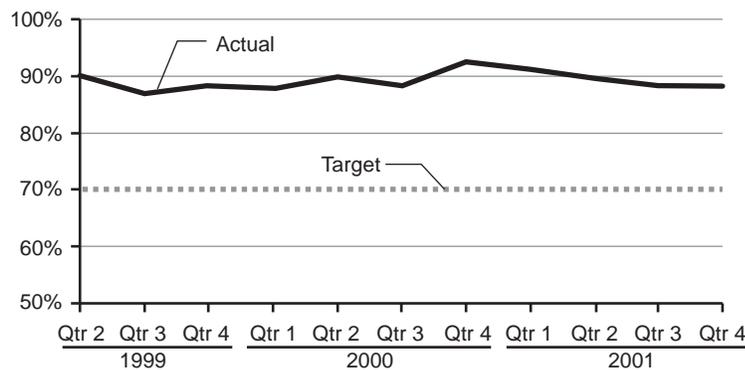


Park & Ride Lot Occupancy at WSDOT Owned Sites in King County

Occupancy of Park & Ride lots continues to be a constraint on increased ridesharing. During the fourth quarter of 2001, the average occupancy for the nearly 8,000 parking spaces in 31 WSDOT lots was 88%. At occupancy levels above 70%, risk of not finding a parking space becomes an issue for potential users and discourages expanded use of vanpooling and transit.

King County Park & Ride Lots

Percent of Capacity Used: 1999-2001*



One-third of the state lots have occupancy in excess of available parking spaces.

The occupancy of WSDOT Park & Ride spaces in King County averaged 88% during the quarter.

However, during the fourth quarter of 2001 the percentage of high-occupancy lots – exceeding the target – dropped to 65% compared to 71% in the third quarter.

* Data availability has a lag of three months to allow the transit systems to collect and analyze the data. Data for the first quarter of 2002 will be available in the next Gray Notebook.

Park & Ride Lot Security

In an effort to better understand security issues and consider a coordinated reporting and tracking system for incidents in WSDOT's 130 Park & Ride lots, WSDOT recently requested incident and accident data from over 100 city and county police departments. While data collection and analysis for this project continues, some preliminary information is now available. As of March 31, over 40 of the 102 police departments contacted have responded with incident data from their jurisdictions.

The incident and accident data was categorized into over 30 incident types by the police departments. In order to simplify reporting of this data and to help identify trends, we combined several categories into a single "serious incidents" classification.

Park & Ride Lot Security Incidents						"Serious Incidents" include:
Year	Number of Lots Reporting	Capacity at Lots	Serious Incidents	Annual Incidents per 100 Spaces	Annual Auto Thefts per 100 Spaces	
1999	65	8,271	194	2.3	1.2	<ul style="list-style-type: none"> • Assaults, • Auto Thefts • Burglaries • Sex Crimes • Vandalism • Robberies • Larcenies
2000	65	7,809	185	2.4	1.3	
2001	69	8,860	331	3.7	2.0	

The data collected and displayed in this table are from limited reporting and not statistically reliable, but they seem to provide a preliminary indication that crime is increasing at many Park & Ride lots.

It appears that increases in auto theft and property theft from autos account for almost the entire jump in incidents from 2000 to 2001. This appears to be indicative of broader trends in criminal activity. For example, in Bellevue so far this year, the rate of stolen or prowled vehicles has increased 40 percent over last year. The Bellevue Police Department attributes the increase partly to an increased focus by auto thieves on multi-stall parking facilities like Park & Ride lots, hospitals, and malls. Across the state, auto thefts increased 18 percent from 1995 to 2000, according to the Washington Association of Sheriffs and Police Chiefs.

It is also important to note that despite the increase, for almost a third of the lots represented in the survey to date, local police reported *zero incidents of any type* during the last three years.

Next Steps

WSDOT will continue to collect and analyze data on this issue. WSDOT has requested crime statistics from the FBI to examine whether trends at these Park & Ride facilities are similar to or distinct from broader crime trends in Washington. WSDOT will also attempt to gather incident data for comparison purposes from other types of parking facilities, such as commercial parking lots. In addition, WSDOT plans to create a task force, including transit agencies and the Washington State Patrol, to develop a work plan on security through design, maintenance, location, and management practices. WSDOT intends to submit final recommendations and potential funding requests in the 2003-2005 budget.

Commute Trip Reduction Overview

Washington law requires employers with more than 100 employees, located in nine Washington counties, to participate in a program to decrease energy consumption, improve air quality and reduce traffic congestion by reducing commute vehicle trips.

WSDOT supports this program with direct and indirect assistance to the employers to encourage voluntarily participation in the program. A tax credit was available in the years 1994-1999 which acted as an incentive for non-obligatory participation. Many employers involved in the program report economic benefits from the program, for example, reduced costs of providing parking for commute vehicles.

Washington State Ferries: Quarterly Update

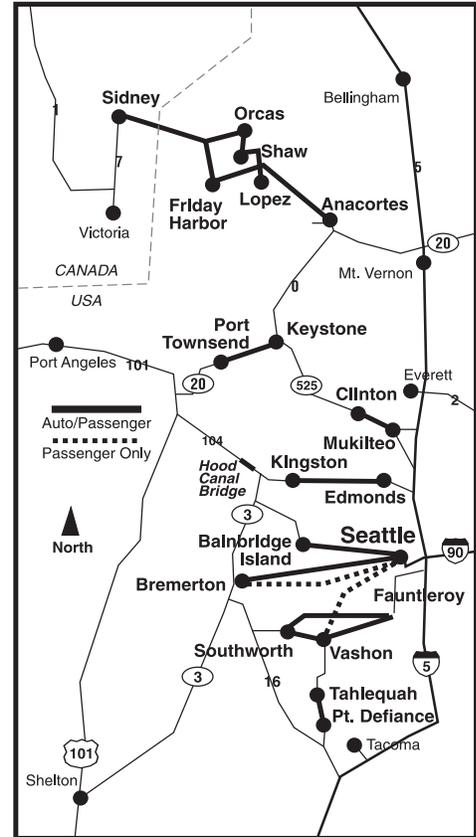
Customer Feedback

The charts show trends in the customer feedback data for the last three fiscal years and through the third quarter of fiscal year 2002 (January 1, 2002 through March 31, 2002). Complaints, compliments, and suggestions are collected in an automated database.

In the third quarter, complaints were down 6 percent from the previous quarter. Ticket complaints were up 35 percent and compliments were up a bit (9 percent). Information-related complaints, driven primarily by problems with the email notification service, were up for the second straight quarter (see note at bottom of page).

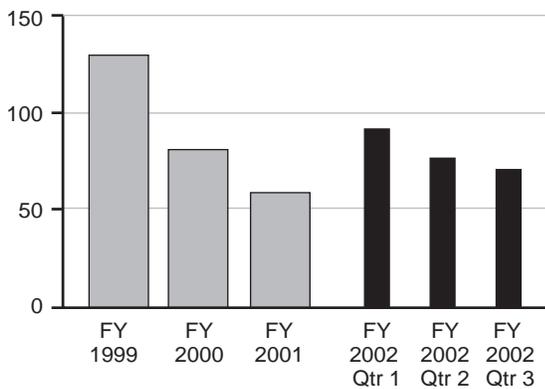


WSF operates the largest ferry system in North America, serving eight counties within Washington as well as Vancouver Island, B.C.



Total Customer Complaints

Complaints per 100,000 Customers*



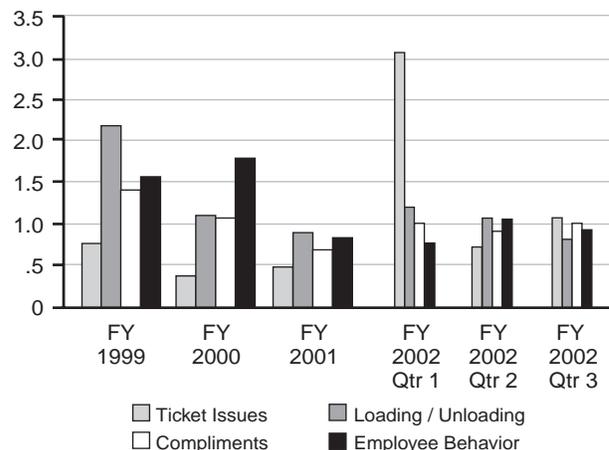
*Does not include compliments or suggestions.

Email Notification Service to Improve

WSF provides an email notification service to customers informing them of delays and service interruptions. As this service has grown (currently WSF has more than 8,500 subscribers), pressures on WSF's information systems have emerged. Sometimes email volumes

Most Frequent Customer Comments

Top Four Comment Types per 100,000 Customers
Fiscal Year 2002, Third Quarter



are causing 1-1.5 hour delays in customer notification. WSF is addressing this delay and has developed a solution involving new technology. The new system will be in place by May 15, 2002 and is expected to virtually eliminate email delivery delay.

On Time Performance

The table below depicts WSF's on-time performance across the system for the first three quarters of this fiscal year. The very good results in the last (third) quarter coincide with the traditional winter lull in ridership. Low ridership makes for easier loading and unloading and therefore tends to correlate with good on-time performance.

On-Time Performance Delivery

For period July 1, 2001 through March 31, 2002

A trip is considered to be on time if it departs within ten minutes of the published scheduled sailing time. Missed trips are not reported in this measure. They are included in the following measure (Trip Reliability).

Route	First Quarter Fiscal Year 2002			Second Quarter Fiscal Year 2002			Third Quarter Fiscal Year 2002		
	Number of Trips	Percent of Trips Within 10 Minutes of Schedule	All Trips Average Delay From Scheduled Sailing Time	Number of Trips	Percent of Trips Within 10 Minutes of Schedule	All Trips Average Delay From Scheduled Sailing Time	Number of Trips	Percent of Trips Within 10 Minutes of Schedule	All Trips Average Delay From Scheduled Sailing Time
San Juan Domestic	7,172	71%	8.5 minutes	6,493	88%	3.5 minutes	6,478	92%	2.0 minutes
International Route	337	87%	4.4 minutes	180	79%	6.4 minutes	175	82%	4.3 minutes
Edmonds/Kingston	4,453	85%	5.3 minutes	4,452	96%	2.8 minutes	4,329	96%	2.5 minutes
Passenger-Only: Seattle/Bremerton	1,584	98%	3.1 minutes	1,660	95%	2.8 minutes	1,604	95%	2.7 minutes
Passenger-Only: Seattle/Vashon	992	97%	3.0 minutes	1,026	98%	2.1 minutes	971	99%	1.9 minutes
Fauntleroy/Vashon/Southworth	10,331	88%	4.3 minutes	10,489	93%	3.3 minutes	10,569	95%	2.9 minutes
Keystone/Port Townsend	2,479	85%	4.8 minutes	1,688	95%	2.8 minutes	1,171	97%	2.0 minutes
Mukilteo/Clinton	6,756	96%	2.6 minutes	6,487	99%	1.6 minutes	6,460	99%	1.7 minutes
Point Defiance/Tahlequah	3,062	92%	3.7 minutes	3,060	91%	3.3 minutes	3,042	93%	3.2 minutes
Seattle/Bainbridge island	4,133	85%	5.5 minutes	4,025	89%	4.6 minutes	4,114	94%	3.8 minutes
Seattle/Bremerton	2,522	97%	3.0 minutes	2,469	98%	2.4 minutes	2,481	99%	2.4 minutes
Total	43,821	87%	4.8 minutes	42,029	93%	3.0 minutes	41,934	95%	2.6 minutes

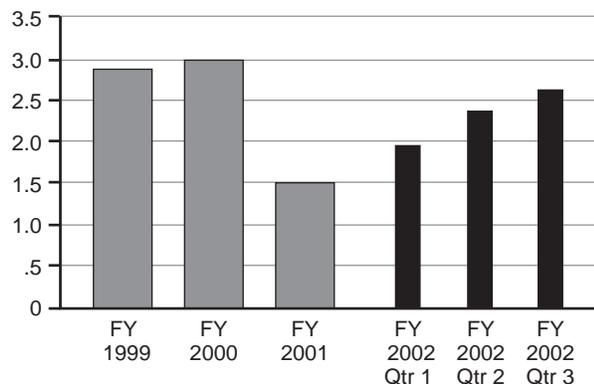
Trip Reliability

WSF scheduled 43,223 trips during the 3rd quarter of fiscal year 2002. Of these trips, 284 were cancelled.

The chart below shows a systemwide average reliability index. Assuming that a commuter worked 200 days per year and made 400 trips on WSF, the statistical likelihood based on third quarter performance is that 2.6 ferry trips would be cancelled. This rating represents the third straight quarter of decline in trip reliability. In fact, the January 2002 trip delivery rate of 98.9% was the fifth lowest monthly rate ever recorded. Two special circumstances, described below, contributed to these performance shortcomings.

Trip Reliability Index

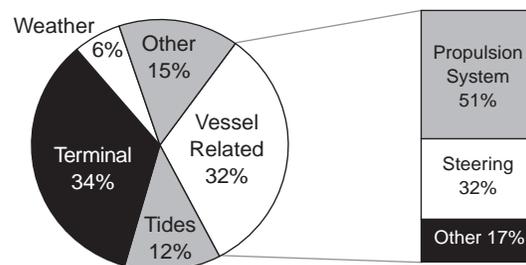
Missed Trips per 400 Sailings See last *Gray Notebook* for formula.



During a low tide on January 7, a new style of chip truck with an unusually low belly became wedged on the transition plate on the Kingston terminal transfer span while loading onto the ferry. It took several hours to free the truck, bringing traffic on the Edmonds/Kingston route to a halt. Twenty trips were cancelled.

Most Common Trip Cancellation Causes

Third Quarter, Fiscal Year 2002



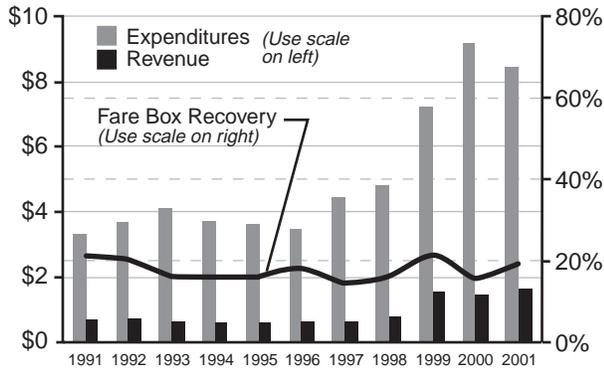
On January 18, hull cracks were discovered on the *Evergreen State* and *Klahowya*. It was determined that the temporary dolphin* repairs recently completed at Southworth had caused the problem. The temporary dolphin installed there was incompatible with the Evergreen State Class of vessels. Between repairing the dolphins, removing the vessels from service, and investigating the problem, sixty customer trips were lost on the Fauntleroy/Vashon/Southworth route. This illustrates the volume of trips on this route. Approximately 25% of all trips scheduled throughout the system are on this busy triangular route structure.

*Dolphin: A group of piers used as a fender at a dock.

WSF Fare Box Recovery

Consolidated Passenger-Only Ferries

Dollars in Millions



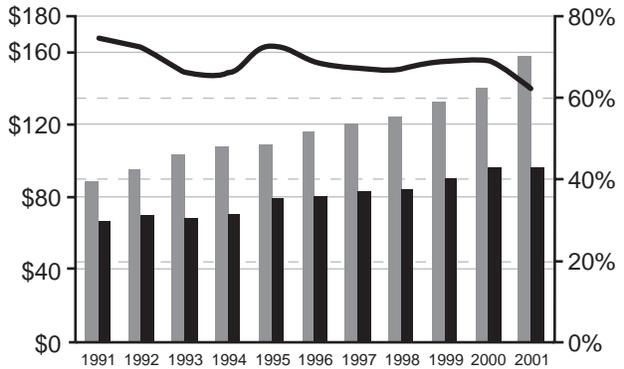
WSF offers passenger-only ferry service from Seattle to Vashon Island and Bremerton.

Operating costs have increased at a faster rate than revenues since program inception. The dramatic cost increases beginning in fiscal year 1999 reflect the introduction of a second boat on the Bremerton route and higher costs associated with operating the new Chinook Class vessels.

However, ridership increased over this period (1998-2001) at a higher rate than the expenditures (ridership +85%, expenditures +76%).

Consolidated Auto Ferries

Dollars in Millions



WSF is an extension of the highway system. Our auto ferry routes carry vehicles, goods, and passengers across Puget Sound. For residents of Vashon Island and the San Juan Islands, the ferry system is the only connection to the mainland.

Operating costs increased at a rapid pace beginning in 1999 with the introduction of the new Jumbo Mark II Class vessels and the rippling effect they had on capacity throughout the system.

Even after cutting service in 2001, WSF experienced an increase in costs. This was due to dramatically higher fuel prices and insurance, utilities, and related support costs.

Fare Box Recovery Comparisons

Farebox recovery measures the relationship between operating costs and fares generated.

Responding to legislative direction, WSF has embarked upon a program of tariff increases designed to reach a systemwide farebox recovery goal of 80%.

The tables on the left compare WSF's farebox recovery performance to other ferry and transit systems. They also show the estimated impacts of the approved tariff increase plan on farebox recovery rates.

The tables show that WSF compares very favorably with other ferry and transit systems and that the tariff increases are moving WSF towards the 80% goal.

However, even after a growth in fare box recovery of 111% for passenger-only routes, WSF is only projecting a 38% fare box recovery rate for the current biennium. This is comparable to other transit systems that do not use a contracted labor force.

Auto Ferry Fare Box Recovery Comparisons

	Fare Box Recovery	Ridership
B.C. Ferries	82%	21,400,000
WSF Auto Routes (2001-2003 Estimate)	71%	24,000,000
WSF Auto Routes (1996-2001 Average)	67%	26,000,000
Alaska Marine Highway	51%	465,000

Transit Fare Box Recovery Comparisons

Vallejo Ferry (Contracted Operator)	78%	801,000
Alameda/Oakland Ferry (Contractor Operated)	71%	541,000
Golden Gate Transit Larkspur and Sausalito	43%	1,886,000
Amtrak Cascades	42%	359,000
WSF Passenger-Only Routes (2001-2003 Estimate)	38%	1,051,000
Alameda/Harbor Bay	33%	130,000
Community Transit Bus Service (Contractor Operator)	26%	8,063,000
King County Metro Bus Service	25%	100,000,000
WSF Passenger-Only Routes (1996-2001 Average)	18%	1,200,000
Pierce Transit	13%	14,597,000

Ridership and Revenues

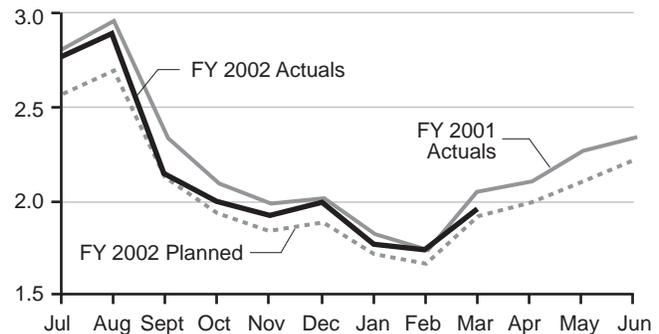
The Legislature's Joint Task Force on Ferries (JTFF), comprised of legislators, citizens, ferry management, and ferry workers was formed in 2000. The Task Force reviewed the workings of the WSF system and made recommendations including tariff increases designed to raise the farebox recovery rate to 80% of operating costs over six years. The Transportation Commission instituted this recommendation and WSF implemented the first tariff increase on June 3, 2001.

The new tariffs were designed to recover higher total revenues and maintain high ridership levels. Despite estimates of a slight decrease in ridership with these new tariffs, ridership and revenues have exceeded expectations every month this year.

Fiscal year to date, ridership has exceeded the plan by 4.4% or 811,000 riders. Revenues have exceeded the plan by 5.8% or \$4.4 million. (Plan based on June 2001 forecast.)

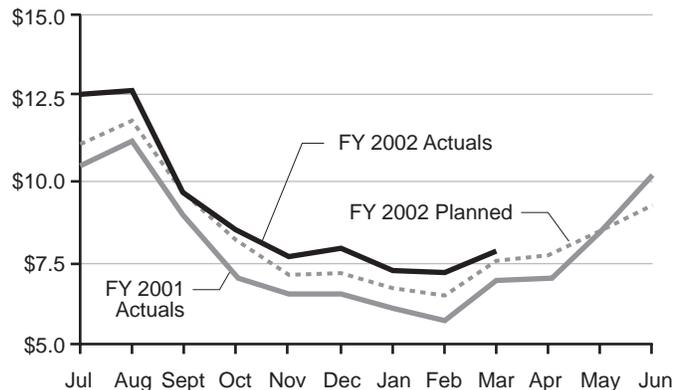
Ferries Ridership by Month

In Millions



Ferries Farebox Revenues by Month

Dollars in Millions



Expenditure Performance

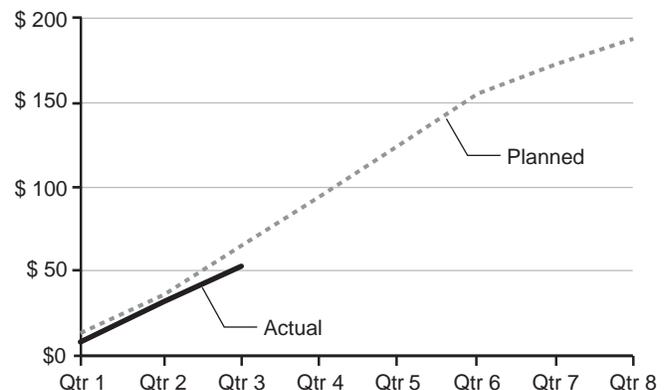
WSDOT makes capital investments in the ferry system through the Washington State Ferries Construction Program. The program preserves existing and builds new ferry terminals and vessels. This infrastructure gives the ferry system the physical capability to deliver responsible and reliable marine transportation services to customers.

At the end of the third quarter of the 2001-2003 biennium the program spent \$52.2 million compared to its plan of \$62.8 million.

Program expenditures are grouped into spending on terminal construction (26% to date), vessel construction (26%), and emergency repairs of terminals and vessels (79%).

WSF Construction Program Expenditures

2001-2003 Biennium, Quarter 3 Ending March 31, 2002
Planned vs. Actual



State-Supported Amtrak Cascades Service: Update

Ridership

Ridership on state-supported Amtrak *Cascades* service was 83,882 for the first three months of 2002. This represents an 11.7 percent increase over the same period in 2001. The quarter's ridership gain is attributable to several factors, including Amtrak's reduced fare programs, the continuing popularity of Amtrak *Cascades* cooperative promotions, and an 18 percent increase in business class travel. In addition, the Portland-Seattle train 754 experienced significant ridership gains. This northbound train, which departs Portland's Union Station at 6:00 p.m. daily, is serving more riders intending to take the northbound *Coast Starlight*, which is scheduled to depart Portland at 4:00 p.m. daily. In recent months, the *Coast Starlight* has been consistently arriving in Portland two to four hours late from Los Angeles, due to rail line delays in Oregon and California. As a result, many local *Starlight* riders are shifting their trips to *Cascades* 754.

WSDOT Actions: 3rd Quarter

WSDOT and Amtrak will implement a modified Sunday schedule for southbound train 751 starting May 5, 2002. The new schedule (Sundays and selected holidays) calls for an 8:00 a.m. departure from King Street Station, is half an hour later than the customary 751 schedule. It is anticipated that this later departure time will be more attractive to leisure travelers and lead to overall ridership increases.

On-Time Performance

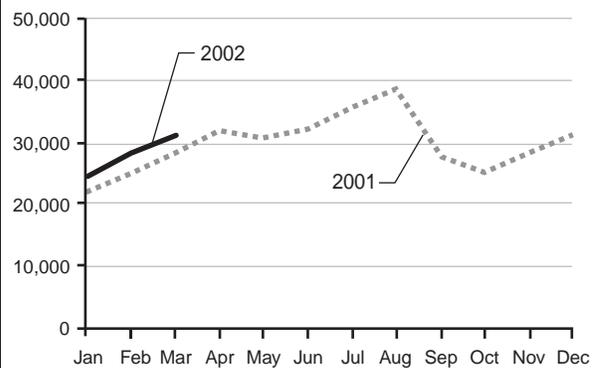
The on-time performance goal for the Amtrak *Cascades* is 80 percent. A train is considered on time if it arrives at its final destination within 10 minutes or less of the scheduled arrival time.

On-time performance for state-supported Amtrak *Cascades* service averaged 73.7 percent in January, 70.5 percent in February, and 72.4 percent in March 2002. BNSF's track repair and tie replacement program contributed to lowering these averages, as did delays caused by track work in Oregon. U.S. Customs inspections at the Canadian border also continue to cause a delay of approximately 15 to 20 minutes for train 763. WSDOT is continuing to investigate ways to obtain U.S. Customs pre-clearance for *Cascades* passengers in Vancouver, BC's Pacific Central Station so that security requirements will have less impact on travel time goals.



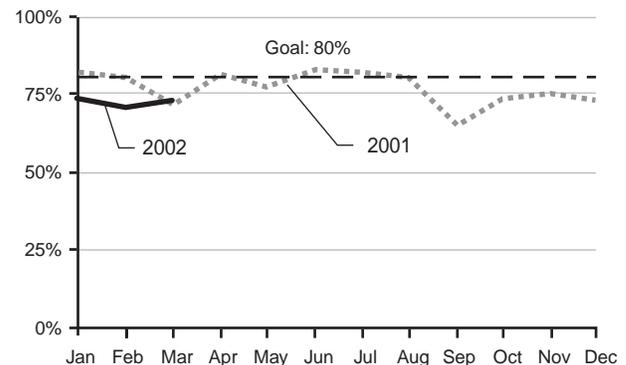
Monthly Ridership Chart

State-Supported Amtrak *Cascades* Service
Number of Passengers



State-Supported Amtrak *Cascades* On-Time Performance

2002 vs. 2001 Percent On-Time
2001 Average: 76.29%



The Future of Amtrak

In 1997, Congress instructed Amtrak to recover 100 percent of its annual operating costs for the national network by the end of 2002 or face possible liquidation. Amtrak recently informed Congress that this goal will not be achieved. At *Gray Notebook* press time, Congress was discussing Amtrak's future and its role in the nation's transportation system.

Cascades service should be able to survive any likely outcome in Congress because the state of Washington is responsible for a large percentage of capital and operating costs associated with the service. However, Amtrak is responsible for two long-distance trains that serve Washington and have a high stake in the current Congressional discussions. These trains are the *Coast Starlight* and the *Empire Builder*. An update on the status of the Amtrak long-distance trains will be included in the next *Gray Notebook*.

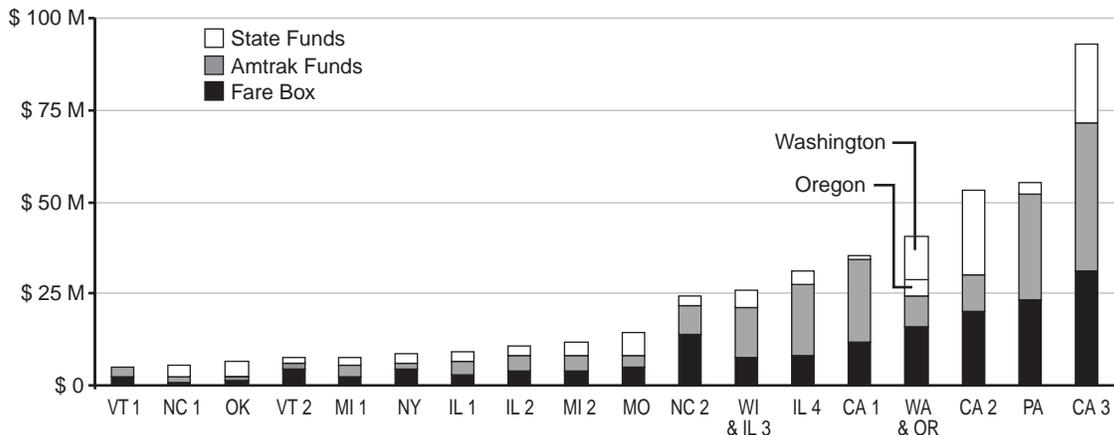
State Investment in Intercity Rail: A National Comparison

Washington is one of twelve states that financially supports the operation of intercity rail service. These states contract independently with Amtrak to provide service within and between their jurisdictions. In federal fiscal year 2001 (October 1, 2000 through September 30, 2001) Washington contributed \$11.6 million toward the operation of eight Amtrak *Cascades* trains. The state of Oregon contributed \$4.67 million toward four *Cascades* trains operating between Portland and Eugene. Amtrak's financial contribution toward the *Cascades* was \$8.65 million.

When compared to other states, Washington's investment in intercity rail operations ranks second nationally. California, which invests more than \$46 million annually, ranks first, and Illinois, which invests \$10.3 million annually, ranks third. The *Cascades*' total ridership ranks fifth among the 18 state-supported routes, and *Cascades*' fare box recovery rate ranks sixth.

State-Supported Amtrak Service: FFY 2001 Annual Operating Costs

Dollars in Millions



Code	State	Route Name	Annual Ridership	Fare Box Recovery	Code	State	Route Name	Annual Ridership	Fare Box Recovery
VT 1	Vermont	Ethan Allen Express	42,078	41%	MO	Missouri	Ann Rutledge/Mules	177,081	32%
NC 1	North Carolina	Piedmont	50,602	14%	NC 2	North Carolina	Carolinian	242,375	56%
OK	Oklahoma	Heartland Flyer	57,799	19%	WI-IL3	Wisconsin & Illinois	Hiawatha	424,004	27%
VT 2	Vermont	Vermonter	69,019	58%	IL 4	Illinois	State House	253,769	25%
MI 1	Michigan	Pere Marquette	58,836	25%	CA 1	California	Capitols	1,075,906	33%
NY	New York	Adirondack	91,469	52%	WA-OR	Washington & Oregon	Cascades	562,340	38%
IL 1	Illinois	Illinois Zephyr	100,175	30%	CA 2	California	San Joaquins	712,063	37%
IL 2	Illinois	Illini	105,169	34%	PA	Pennsylvania	Keystone	962,414	42%
MI 2	Michigan	International	105,114	29%	CA 3	California	Pacific Surfliner	1,716,512	33%

Fare Box Recovery: The percentage of total annual operating costs generated through ticket fares. *Source:* Amtrak West

Washington Grain Train

In response to a national shortage of rail grain cars, a partnership of the State of Washington, the Port of Walla Walla, and the Blue Mountain Railroad purchased 29 grain cars with federal funds in 1994. These grain cars were used to transport grain from eastern Washington to ports on the Columbia River and on Puget Sound. An additional 36 cars were purchased in 2000. The grain train now serves farmer cooperatives in Shrag, Warden, Thornton, Endicott, La Crosse, Willada, Prescott, and St. John.

In the first three months of 2002, 258 carloads moved on the Grain Train, a 28 percent increase over the same period in 2001. Efficient freight handling by the Columbia Basin Railroad and the BNSF enabled exceptional shipment of three 26-car trains to Vancouver from Warden/Shrag.

The carload growth from the same period last year also resulted from a new service (inaugurated in October) using the grain cars to shuttle grain from the Palouse region to the river barge terminal at Wallula via the Palouse and Coulee City and Blue Mountain Railroads.

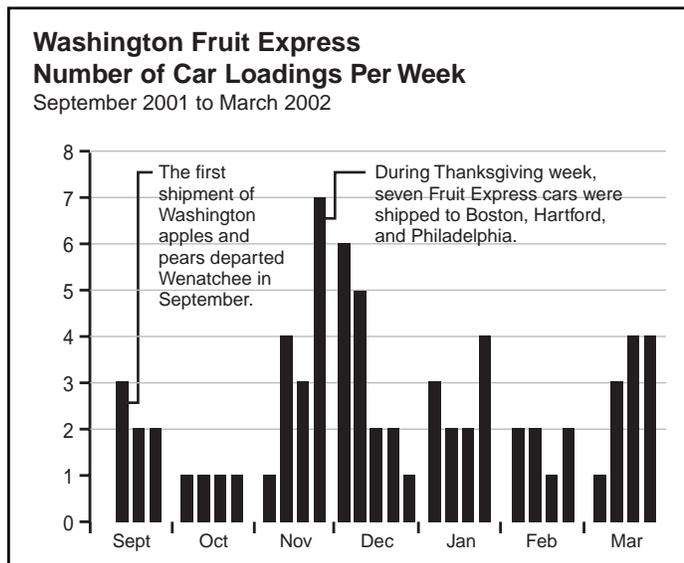
The commodity value of the grain moved on the Grain Train in the quarter ending March 31, including cars owned by WSDOT and the Port of Walla Walla, was approximately \$3.1 million. This grain haulage offset approximately 735 heavy truck loads that would have been used if the grain had moved by road.

Washington Fruit Express

The Washington Fruit Express speeds Washington produce to east coast markets in refrigerated cars hauled by Amtrak's *Empire Builder*. Five-day shipping to market supplies a premium product to eastern produce wholesalers and grocery chains. The program is a partnership of WSDOT, the Cascade and Columbia River Railroad, ExpressTrak, the Washington State Department of Agriculture, and several produce associations.



The estimated value of loadings on the Fruit Express in the six month period from last September through this March was approximately \$3.7 million.



WSDOT is sponsoring a symposium in Wenatchee in June 2002 to determine ways to improve rail transportation of perishable produce from Washington. Railroads, shippers, growers, and trade associations will all participate. An important contribution to the conference should be made by separate surveys now underway by WSDOT and the Washington State Department of Agriculture to improve the attractiveness of the Fruit Express to shippers in Washington as well as to buyers in several eastern cities.

Highlights of Program Activities

Quarter Ending March 31, 2002

January 2002

- Transportation Secretary Doug MacDonald announced the appointments of Michael G. Thorne as the new CEO of Washington State Ferries and John Sibold as the Aviation Division director.
- WSDOT held a public meeting on the upcoming Interstate 5 widening project from NE 99th Street to NE 134th Street and the replacement of the 129th Street Bridge in Vancouver's Salmon Creek area.
- WSDOT's Southwest Regional Administrator recommended based on collected data that the hours of operation for the new High Occupancy Vehicle (HOV) lane on Interstate 5 in Vancouver be changed to 6 a.m. to 8 a.m., Monday through Friday. Since it opened on October 29, 2001, the lane had been operating weekdays from 6 a.m. to 9 a.m. The change went into effect on January 14.
- Replacement of the Toutle River Rest Area buildings neared completion. New facilities will serve northbound and southbound I-5 travelers in northern Cowlitz County.
- A total of ten contracts were awarded in January to successful low bidders, for a total amount of \$6,459,473. Examples of projects to be constructed are:
 - Old Moose Creek west and east culvert replacement on State Route 530, in Snohomish County.
 - U.S. 12/U.S. 395 paving in the Pasco area, near the Snake River.
 - Skykomish River bridge painting project near Skykomish on U.S. 2.
- WSDOT held an open house in Blaine for the State Route 543 commercial truck-crossing project under design for the international border.
- The Portland/Vancouver Interstate 5 Transportation and Trade Partnership Task Force voted to adopt draft recommendations for proposed improvements to the Interstate 5 corridor.
- Project engineers for the North Spokane Corridor (NSC) project made a presentation to the East Central Neighborhood group regarding WSDOT's plans for Interstate 90 and the I-90/NSC Interchange in that area.

February 2002

- A volunteer citizen committee met to advise WSDOT on safety improvements for State Route 203 between High Rock Road (north of Duvall) and Monroe.
- Thirteen WSDOT trucks went out day and night to sand and plow the roadways in the Grays Harbor area to address snow and ice during a stormy week early in the month.

Continued on next page

- Crews working for WSDOT reopened a section of the westbound HOV lane near Bellevue on State Route 520 four days early. The section of highway was closed for earthquake strengthening work on bridges and overpasses in the area.
- A new passenger ramp portion of Slip #1 at Washington State Ferries' Colman Dock in Seattle went into service, providing better customer flow from the terminal to the vessels as well as protection from the rain and wind.
- For the second month in a row, Amtrak *Cascades* ridership increased by double digits over the same time period last year – 15 percent in January and 14 percent in February.
- Yakima County, the Yakama Nation, the WSDOT Rail Office and the WSDOT Tribal Liaison opened a new spur rail line connecting the Yakama Nation's sawmill at White Swan to the Toppenish Simcoe and Western Railroad.
- The ferry *Hyak* returned to service following a five-month preservation project to improve its operation for more reliable and sustained speeds.

March 2002

- WSDOT's North Central Region Avalanche Control team traveled by a snow cat over State Route 20 for an initial snow and safety assessment evaluation regarding opening the Washington Pass. Crews found avalanche chutes still active. WSDOT started plowing the road for spring opening.
- WSDOT reopened the newest segment of HOV lanes north of Canyon Park at the Snohomish/King County line on I-405 months ahead of schedule.
- WSDOT maintenance crews successfully addressed late season snow and ice on Whatcom, Skagit, and Island County highways.
- A toll-free telephone number (1-888-461-8816) was made available for customers in WSDOT's North Central Region to contact the Wenatchee Headquarters Office.
- WSDOT's traveler information system helped inform motorists about road conditions during a late-winter/early-spring storm that caused pass closures and traffic back-ups.
 - The average number of visitors to the WSDOT travel website each day is about 25,000. During the storm, the website was used by 68,000 visitors.
 - The average number of calls to WSDOT's 1-800-695 ROAD each day is 8,000. During the storm, the 1-800 number was called by 40,000 travelers.
- WSDOT teams designed and executed a significant bridge repair on State Route 500 in Camas that avoided closing the entire bridge and delayed traffic for only 15 minutes at a time. The effort not only saved traffic back-ups but thousands of dollars as well.
- WSDOT awarded to Lakeside Industries in Centralia a construction contract for road improvements on U.S. 12 between Interstate 5 and Mill Creek in Lewis County. Lakeside's low bid was over \$500,000 less than the original cost estimate.

Special Features

No, it's not roadside art – it's an innovative, low-cost approach to dealing with drift hazards

Stretches of highway in central Washington are sometimes covered in winter by snow drifts, or at other times of the year, by wind-blown drifts of sand. At plot locations near Vantage and Mansfield, a technology adapted from use in Antarctica, has gone forward in eliminating these hazards. Plastic-covered aluminum



These vortex generators are situated on State Route 243, just south of the Interstate 90 Vantage Bridge crossing the Columbia River.

“vortex generator” frames, made at minimal expense by students at Cascade High School in Leavenworth, have been placed by WSDOT on tall stilts located next to the roadway. Pivoting in the wind, they redirect the natural airflow to clear the roadway of snow or sand.

Results That Matter

The North Central Region noted before-and-after costs with respect to this installation and found that for an annual period, overtime and equipment costs for snow and sand clearance on this stretch of highway would be reduced from about \$ 6400 to about \$ 250. It was the Treasurer to King William, Queen Anne and King George III, who used to say, “*Take care of the pence, for the pounds will take care of themselves.*”

Safety margins are enhanced because the vortex generators function whenever the winds are drifting snow and sand, so there is no wait time for plow dispatch and arrival.

The technology is transferable and adaptable. Inquiries have already been received from other states. Information is available at www.wsdot.wa.gov/regions/northcentral/Maint/MaintenanceProgram/vortex/vortex.htm

Asphalt Concrete Pavement Projected and Awarded Tons

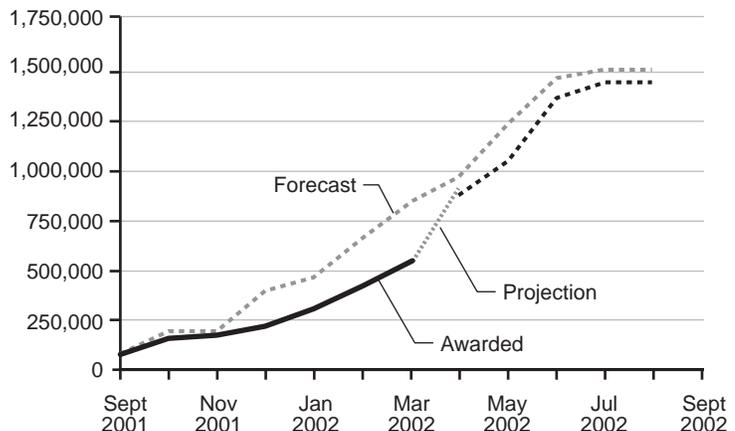
As of the end of March, the number of tons of asphalt concrete pavement awarded in contracts lagged behind the projection. The major cause of this lag is late advertisement dates and extended advertisement periods.

The drop in the forecast line shown beginning in April reflects the reduction in the Highway Construction Program as a result of the 2002 supplemental budget adjustment adopted by the Washington State Transportation Commission.

Forecasting ahead, with projects being awarded in April, it appears that the department will make up for this lag and remain fairly close to the “revised” forecast line.

Asphalt Concrete Pavement

Projected and Awarded Tonnage Delivered
September 2001 to August 2002



Working Together to Clear Accidents

Washington State Department of Transportation has worked cooperatively with Washington State Patrol (WSP) for many years on numerous issues of joint interest and have agreed to formalize this relationship in a joint policy statement. A Joint Operations Policy Statement was signed by WSDOT Secretary Doug MacDonald and WSP Chief Ronal Serpas on February 13, 2002.

Its objectives are:

- Enhanced WSP presence in highway work zones.
- 90-minute highway incident clearance goal on congested freeways.
- Radio interoperability.
- Co-location of facilities wherever possible.
- Modernized accident investigation techniques.
- Additional truck inspection facilities and greater use of Commercial Vehicle Information Systems Network.
- Expanded surveillance of key facilities for security.
- WSP security presence on state ferries.

Some of the objectives can be met by better integrated use of existing resources. Some require legislative and budgetary support. The 2002 legislative session funded an additional 19 incident response vehicles and new computer technology for incident reporting. Expect to see:

- New roving incident response trucks in Puget Sound, Vancouver, Spokane, and on Stevens and Snoqualmie Passes.
- Expanded tow truck operator and WSP service patrols on several I-5 segments and also new I-5 coverage by contracted Motorist Assistance.

Steer It, Clear It legislation supported by WSDOT and WSP was enacted this year by the legislature (House Bill 2345, effective June 2002).

The new law states that in a collision involving no injuries, the driver must move the vehicle off the freeway to an exit ramp, frontage road, cross street, etc., as soon as possible. In addition, *Steer It, Clear It* legislation holds law officers and WSDOT clearance crews harmless for damages caused by removal efforts.

Steer It, Clear It is common sense on the roadways. But driver education will be important if the law is to be successful.



The WSP and WSDOT cooperate together at an incident.

Improvements in Crash Scene Investigation Technology

WSP will be training 10 personnel working on the I-5 corridor in the use of Photomodeler Pro software used for ground-based photogrammetry, with the goal of reducing time spent gathering crash data at the incident scene.

Managing Congestion One Incident at a Time

One major element in managing congestion is the reduction of incident-related congestion. The Joint Operations Policy Statement (JOPS) instituted a total 90-minute highway incident clearance goal. The two agencies are working together to measure response and clearance times. In the weeks since the policy was signed (February 13 to March 31), WSDOT Incident Response Teams (IRT) have responded to 88 incidents on I-5. Most incident clearance times were under the 90-minute goal.

Examples of incidents that did not meet the new 90-minute JOPS goal:

- On February 18, a truck hit the guardrail near Castle Rock causing a blocking incident. This was followed by a secondary accident as another truck hit a WSP unit on site. An IRT was called at 6:30 am and cleared the accident by 10:00 am. WSDOT, WSP, Castle Rock Fire Department, and a private tow company responded. The long clearance time was caused in part by the secondary accident, the number of vehicles involved, and the WSP investigation.
- On February 24, an accident south of Blaine between a tractor-trailer and a car occurred. An IRT was contacted at 8:06 am and left the site at 12:58 pm. The incident took over four hours to clear. WSDOT, WSP and a private tow company responded.
- On March 19, an accident occurred just north of Everett. An IRT was called at 12:10 pm, arrived at 12:20 pm and left the site at 3:50 pm. A semi truck lost a container, blocked traffic, and caused property damage. WSDOT, WSP and Everett City Police, Everett Fire Department, and a private tow company responded.

Intelligent Transportation Systems in Washington State

WSDOT has applied advanced technology to transportation problems since the 1960s, when closed-circuit TVs were installed during construction of I-5. In the 1980s, freeway ramp meters were deployed to decrease urban congestion, and in the 1990s incident response teams began operating on I-5 in the Puget Sound area. WSDOT has become a national leader in implementing Intelligent Transportation Systems (ITS) solutions that can help save time, dollars, and lives.

Advanced Traffic Management Systems

Traffic management centers (TMC) operate in Seattle, Tacoma, Spokane, Vancouver, and Yakima, with one being built in Bellingham. TMCs depend on field devices such as WSDOT's 5,000 loop detectors, 15,000 traffic signal loops and 375 closed-circuit TV cameras to detect and respond to incidents and congestion. Over 140 ramp meters monitor occupancy levels on freeway ramps and help smooth freeway traffic by regulating vehicle entrance rates. TMCs also operate highway advisory radio messages (HAR) with 39 transmitter locations and 90 variable message signs (VMS) across the state to inform travelers of congestion and incidents.

Advanced Traveler Information Systems

WSDOT has installed numerous information systems to provide travelers and tourists with the

General ITS Categories Applicable to Washington State:

- **Advanced Traffic Management Systems (ATMS)** include technologies designed to help monitor, control, and smooth traffic flow.
- **Advanced Traveler Information Systems (ATIS)** acquire, analyze, communicate, and present information to help the public travel in the ways that best satisfy their needs for safety, efficiency, and comfort.
- **Commercial Vehicle Operations (CVO)** utilize technologies that improve the flow of commercial vehicles, increase operational safety, and minimize truck stops at weigh stations and ports of entry.
- **Advanced Rural Transportation Systems (ARTS)** complement ITS efforts in metropolitan areas and commercial vehicle operations by addressing transportation problems in rural areas. Examples include cameras (mountain passes), variable speed limits (Snoqualmie Pass), and computerized de-icing applications on I-90.
- **Advanced Public Transportation Systems (APTS)** include an array of technologies, from helping dispatchers visually track buses to providing passengers audio and visual displays of the next bus stop.
- **Intelligent Vehicle Initiative (IVI)** centers on three levels of vehicle capabilities and system integration: driver warning and information, driver assistance, and vehicle automation. These innovations are on the verge of wider use in Washington and around the country.

latest road and weather condition information. Such information assists travelers to make informed decisions about where and how to travel, resulting in trips that are safer and faster. The systems include:

- A statewide traffic, weather, and road conditions website (www.wsdot.wa.gov/traffic/).
- WSDOT's real travel time information website (www.wsdot.wa.gov/pugetsoundtraffic/traveltimes/) (also see "Measuring Congestion" on page 4).
- Support for TV and radio traffic newscasts.
- Numerous highway advisory radio and variable message signs throughout the state.
- A ferry hotline (1-800-84-FERRY) and website (www.wsdot.wa.gov/ferries/index.cfm) to provide information on schedules and real-time ferry locations and wait times.
- A hotline (1-800-695-ROAD) to provide information on road congestion, conditions, and construction closures. This will become 5-1-1 phone service this year (2002) to combine access to all of WSDOT's traveler information hotlines, as well as those of transit and other agencies, providing more comprehensive information statewide.

Highlights of other ITS categories will appear in future *Gray Notebooks*.

ITS Focus Strategies/ Technologies	Geographical Area					
	Puget Sound	Spokane	Vancouver	Yakima	Other Urban Areas	Intercity/ Rural
Advanced Traffic Management						
Traffic Management Centers	■	■	■	■	■	
Incident Response	■	■	■			
Advanced Traveler Information						
VMS	■	■	■	■	■	
HAR	■	■	■	■	■	
Road/Weather Information	■	■	■	■	■	
1-800-695-ROAD	■	■	■	■	■	■
Commercial Vehicle Operations						
CVISN	■					■
Border Crossing	■				■	■
Port Operations	■					
Advanced Rural Transportation						
VMS						■
HAR						■
Ice Detection						■
Variable Speed Limit						■
Advanced Public Transportation						
My Bus	■					
BusView	■					
Ferry Vessel Watch	■				■	■
Signal Transit Priority	■					

Analysis of Congestion Benchmark Policy Goals included in the Transportation Efficiency Bill (ESHB 2304)

The Transportation Commission's Benchmark Committee has analyzed two measures that were originally proposed by the Governor's Blue Ribbon Commission on Transportation (BRCT) and reflected as policy goals in the recently enacted Transportation Efficiency Bill (Engrossed Substitute House Bill [ESHB] 2304). The commission is asked to establish detailed and measurable performance benchmarks based on these policy goals.

Policy Goal: "Traffic congestion on urban state highways shall be significantly reduced and be no worse than the national mean."

A mathematical computation of congestion performed by Professor Hartgen at the University of North Carolina strongly influenced the BRCT's views.

A BRCT committee report stated, based on Professor Hartgen's work, that the percentage of urban interstate congestion in Washington State was between 60% and 80% (i.e., 60% to 80% of interstate highways operated with volume to capacity ratio in excess of 70%). Data then became available from Professor Hartgen for 1999 showing 46.39% of urban interstate highways are congested in Washington State, in relation to a national mean of 40.15%. This ranked Washington as the 37th least congested state (14th worst congested state). More recently Professor Hartgen has released even newer data for 2000. According to this most recent information only 18.25% of Washington's urban freeways are congested, compared to a national mean of 40.13%. Washington, according to Professor Hartgen, now ranks as the 14th least congested state (37th worst congested state).

This dramatic fluctuation in Washington's ranking over a one year period under Professor Hartgen's analysis suggests that the methodology and measurement approach may be flawed. WSDOT does not believe that congestion has dropped this drastically. Accordingly, Professor Hartgen's numbers should not be relied upon at this time as a reliable congestion benchmark or as a basis of comparison to other states.

Policy Goal: "Delay per driver shall be significantly reduced to not worse than the national mean."

This measure was apparently based on Texas Transportation Institute's (TTI) *Urban Mobility Report*. BRCT benchmark #7 references the TTI study that provided a congestion ranking of 68 major urban areas by annual hours of delay per driver. The BRCT report using the TTI data shows that the Seattle-Everett area experienced 70 hours of average delay per driver annually, compared to the national average of about 40 hours for 1997.

TTI ceased reporting delay per driver in 1999 and there is no longer a data source that computes delay per driver. Now TTI has switched from delay per *driver* to delay per *person*. According to 2001 TTI *Urban Mobility Report*:

- Spokane has 10 hours of annual person hours of delay, which equals the national average of 10 annual person hours of delay for small urban areas in the measure-

ment sample.

- Tacoma has 27 hours of annual person hours of delay, compared to the national average of 26 hours for medium urban areas.
- Portland-Vancouver has 34 hours of annual person hours of delay, compared to the national average of 34 hours for large urban areas.
- Seattle-Everett has 53 hours of annual person-hours of delay, compared to the national average of 34 for large urban areas.

This measure represents an inadequate measure of congestion as it does not take account of measurement of incident related (non-recurring) congestion. Incident related congestion contributes significantly to daily delays and a meaningful measurement needs to be able to assess both recurring and non-recurring congestion. A recent publication from TTI's Mobility Monitoring Program acknowledges this shortcoming. "Incident management activities and other operational improvements have a beneficial effect that is not captured in the Urban Mobility Study procedures. Most of the Mobility Monitoring Program cities have an incident management program as part of the corridor operations." (Tim Lomax and Richard Margiotta, *Monitoring Urban Roadways in 2000: Using Archived Operations Data for Reliability and Mobility Measurement*, Texas Transportation Institute, page 18).

Measuring Congestion: WSDOT's Work to Date

WSDOT has made significant progress in recent months in developing a congestion measurement and benchmarking approach that will avoid some of the pitfalls illustrated in the analysis above and meets the intent of the Efficiency Bill. As described in the "Measuring Congestion" section of this quarterly report (page 4), the Washington State Transportation Commission's Benchmark Committee agreed to develop a measure that is based on real time measurements rather than modeling and will allow discriminating between recurrent and non-recurrent congestion independently.

Notes to the Gray Notebook

Worker Safety

Continued from page 1

Reading the Charts

"Recordable injuries and illnesses" is a standard measure that includes all work related deaths and work related illnesses and injuries, which result in loss of consciousness, restriction of work or motion, transfer to another job, or require medical treatment beyond first aid.

One worker equals 2,000 hours per year.

The U.S. Bureau of Labor Statistics provides the selected 2000 national average benchmarks. After consultation with the National Bureau of Labor Statistics, the following benchmarks were adjusted from previous quarters to allow for a more comparable standard to WSDOT's specific worker classifications.

- Maintenance: *Highway and Street Construction*, Standard Industry Classification (SIC) 161 (rate 8.2).
- Engineering: *Engineering and Architect Services*, SIC 871 (rate 1.7).
- Ferry Vessel workers: *Water Transportation* SIC 44 (rate 7.0).

Gray Notebook Subject Index

Publication Key: 1 = Quarter 1 2001, 2 = Quarter 2 2001, 3 = Quarter 3 2001, 4 = Quarter 4 2001, 5 = Quarter 1 2002
www.wsdot.wa.gov/accountability

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