Washington State
Department of Transportation

The 2013
Corridor Capacity Summary

The 12th edition of the annual *Congestion Report*

Published November 2013

Lynn Peterson, Secretary of Transportation

A summary of WSDOT's comprehensive annual multi-modal analysis of state highway system performance

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MAP-21 and Results Washington

WSDOT has been proactive in working with the American Association of State Highway and Transportation Officials (AASHTO) and U.S. Department of Transportation to propose performance measures for the Moving Ahead for Progress in the 21st Century (MAP-21) federal law. WSDOT supports the inclusion of air quality, congestion, system performance, and capacity-related performance measures in MAP-21.

Governor Jay Inslee's strategic plan for Washington state, called Results Washington, includes capacity-related transportation performance measures, as well as measures for sustainable transportation and infrastructure and clean energy use. WSDOT has been working closely with the Governor's Office to propose indicators in these areas. For more information about MAP-21 or Results Washington, see p. 30 of the 2013 *Corridor Capacity Report*.

How to read the report

Purpose of the report

The 2013 *Corridor Capacity Report* informs the legislature, stakeholders, education and research institutions, the media, communities and the public about the state of congestion and transportation capacity in Washington for the calendar year 2012 compared to 2010. It also provides 2007 data as reference (where available) to capture pre-recession conditions. WSDOT and University of Washington experts use a two-year span to identify changes and trends seen on the state highway system that may be missed looking at a one-year comparison.

The *Corridor Capacity Report's* detailed analysis shows where and how much congestion occurs, and whether it has grown on state highways. The report focuses on the most traveled commute corridors around the state.

Report changes

New this year, WSDOT is expanding corridor performance information with a focus on multi-modal person trips: how is the corridor performing in terms of maximizing the movement of people? Transit ridership, park and ride use rates, and greenhouse gas emissions are shown alongside average and reliable travel times using high occupancy vehicle and single occupancy lanes for specific congested corridors. Commute trip performance reporting is also expanded to other urban parts of the state beyond the central Puget Sound and Spokane areas. This summary document is designed to provide overview information for policy makers; more in depth analysis is presented in the main 92-page report – the 2013 *Corridor Capacity Report*.

Report structure

This summary is organized to flow logically from a broader statewide picture to project level detail. It begins with statewide system performance measures (including performance of the Washington State Ferries) followed by corridor based performance measures, concluding with project-specific Before and After performance analysis.

The central portion of this report presents the performance of specific congested corridors around the state, each on its own double-sided page. Each page is intended to serve as a standalone document for a specific corridor. For example, the I-5 corridor performance on pp. 7-8 has a map of the I-5 corridor with various performance measures presented in charts and tables on one side of the page, while the other side tells the congestion and capacity story with key takeaway messages for that corridor.

Congestion still below pre-recession levels in 2012

Statewide congestion data for the past six years (2007 through 2012) indicate that 2009 was the least congested year for Washington drivers. The statewide congestion indicators are still below pre-recession levels, as the economy continues to rebound.

In 2012, on average each person in the state was delayed in traffic for 4 hours and 30 minutes. This means an average household of two commuters spent 9 extra hours of time on the road due to traffic. This is 12 minutes lower than in 2010, when the per-person vehicle hours of delay on state highways was 4 hours and 42 minutes. Similarly, per-person vehicle miles traveled (VMT) in 2012 on state highways dropped 3.1% from 4,724 miles to 4,578.

The delay on state highways cost Washington citizens and businesses $780 million in 2012. This is roughly $115 per person. For a household of two commuters this is $230 each year. To put it in perspective, this amount is equal to 60 gallons of gas ($3.84 per gallon) allowing the household to drive approximately 1,500 miles at 25 miles per gallon.

When miles traveled are averaged across the population, it is as if each Washingtonian drove 8,303 miles in 2012, of which 4,578 were on the state highway system. Even though this sounds like a lot, the person-miles traveled in 2012 were actually lower than 2010, by 2.4% on all roadways, and by 3.1% on state highways.

WSDOT introduces new multi-modal measures

With this edition, WSDOT introduces new performance measures and a new graphical display of information, all with an emphasis on multi-modal and person-based metrics.

The new measures include park and ride (P&R) lot utilization, routinely congested highway segments, greenhouse gas (GHG) emissions, transit ridership, and the costs of congestion for commuters.

The graphical displays on odd pages, starting page 7 through 23, show key system performance information related to specific urban corridors, all aligned with a map of the corridor. Average and reliable travel times, hours of delay, vehicle miles traveled, are also presented along with other metrics.

Park and ride lot utilization rates

The P&R lot locations are also presented on the map, along with the available spaces and percent occupied in a table to help tell the multi-modal system performance story. The P&R lots primarily cater to transit services on the corridor - other P&R lots exist as well.

Routinely congested highway segments

For the first time, WSDOT is presenting the routinely congested segments in graphical format on each of the corridors statewide (except I-90 in Spokane). The routinely congested segments are identified for morning and evening commutes by direction of travel, length of congested segment in miles, and duration of congestion in hours.

Greenhouse gas emissions estimated for corridors

In this report WSDOT is including a discussion on greenhouse gas emissions as they relate to vehicles emissions. Travelers on the 40 high-demand commute corridors in the central Puget Sound area emitted about 12,156 metric tons of carbon dioxide (CO_2) each weekday in 2012. To put it in perspective, this means an average commuter who drives in central Puget Sound area is responsible for emitting more than 13 pounds of CO_2 daily. This estimate is for a subset of all Seattle area daily travel. These emissions do not include principal arterials and surface streets in the area.

Transit takes more than 43,800 cars off the road daily

In 2012, there were nearly 70,600 daily transit riders during the peak commute periods, on the high-demand corridors in the central Puget Sound area. This took more than 43,800 cars off the road, which in turn avoided approximately 674,700 pounds of CO_2 emissions daily. For example, buses and light rail from SeaTac to Seattle in the morning and from Seattle to SeaTac in the evening showed about 7,600 and 10,200 passengers each day during the peak periods, respectively.

Congestion costs decrease on some corridors

The cost of commute congestion (wasted time and gas) in the central Puget Sound area, on the 40 high-demand commute routes, increased on 21, decreased on 14, and remained the same on 5 commutes. The largest reductions in commute congestion cost were on the SR 520 corridor. Tolls were implemented in December 2011, and a significant number of commuters choose to drive alternate routes rather than pay the toll.

For example, the cost of congestion for commute trips on the I-5 corridor in 2012, for a round trip to and from work, ranged from $400 to $1,500 annually for each person. The Everett-Seattle round trip had the highest commute congestion cost on this corridor in 2012.

Corridor Capacity Report Dashboard of Indicators

2013 *Corridor Capacity Report* Dashboard of Indicators *Dollar values are inflation-adjusted, measured in 2012 dollars*	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**Difference '10 vs. '12**
Demographic and economic indicators							
State population (thousands)	6,525	6,608	6,672	6,725	6,768	6,818	1.4%
Gasoline price per gallon (annual average)[1]	$3.29	$3.64	$2.76	$3.17	$3.80	$3.84	20.8%
Washington unemployment rate (annual)	4.6%	5.4%	9.4%	9.9%	9.2%	8.2%	-1.7%
Washington real per person income[2]	$46,265	$46,706	$44,386	$44,369	$45,197	$45,941	3.5%
Multi-modal performance measures							
Drive alone commuting rate[3]	73.1%	71.5%	72.1%	73.0%	73.3%	-	-
Carpooling commuting rate[3]	11.4%	12.2%	11.3%	10.5%	10.2%	-	-
Public transit commuting rate[3]	5.4%	5.5%	5.9%	5.5%	5.6%	-	-
Transit ridership[4] (in millions)	195.2	215.6	210.1	207.8	213.0	-	-
Washington State Ferries ridership[4] (in millions)	24.1	23.3	22.5	22.6	22.3	-	-
Bicycling and walking commuting rate[3]	4.1%	4.5%	4.3%	4.4%	4.2%	-	-
Statewide congestion indicators							
Per person, total vehicle miles traveled on all public roads, state highways only							
All public roads vehicle miles traveled (VMT), in billions	56.964	55.447	56.461	57.191	56.965	56.607	-1.0%
All public roads per person VMT, in miles	8,730	8,391	8,462	8,505	8,417	8,303	-2.4%
State highways VMT, in billions	31.970	30.742	31.456	31.764	31.455	31.214	-1.7%
State highways per person VMT, in miles	4,900	4,652	4,714	4,724	4,648	4,578	-3.1%
Congestion on state highway system							
Total state highway lane miles	18,425	18,500	18,571	18,630	18,642	18,659	0.2%
Lane miles of state highway system congested	1,032	962	966	1,025	1,007	1,026	0.0%
Percent of state highway system congested[5]	5.6%	5.2%	5.2%	5.5%	5.4%	5.5%	0.0%
Per person, total, and cost of delay on state highways							
Annual hours of per person delay on state highways[6]	5.4	5.3	4.2	4.7	4.8	4.5	-4.3%
Total vehicle hours of delay, in millions of hours[6]	35.1	34.8	28.1	31.6	32.5	30.9	-2.4%
Cost of delay on state highways (2012 dollars)[6]	$931	$890	$721	$800	$821	$780	-2.4%
Corridor-specific congestion indicators (52 central Puget Sound area commutes)							
Annual Maximum Throughput Travel Time Index (MT^3I)[7]	1.45	1.25[8]	1.30	1.39	1.35	1.39	0.0%
Number of commute routes with $MT^3I > 1$[7]	46	41[8]	43	45	44	44	-1
WSDOT congestion relief projects							
Number of completed Nickel and TPA mobility projects as of December 31 of each year (cumulative)	33	43	65	73	82	91	18
Cumulative project value (dollars in millions)	$963	$1,289	$2,212	$2,596	$2,802	$3,851	$1,255

Data source: Washington State Office of Financial Management; Economic and Revenue Forecast Council; Bureau of Economic Analysis, U.S. Department of Energy - Energy Information Administration; Bureau of Labor Statistics – Consumer Price Index; WSDOT State Highway Log; U.S. Census Bureau - American Community Survey, National Transit Database.

Notes: WSDOT's annual *Congestion Report* is renamed as the *Corridor Capacity Report* beginning with the 2013 publication. Analysis in the 2013 *Corridor Capacity Report* examines 2010 and 2012 annual data; 2007 is included to show pre-recession levels. All dollar values are inflation-adjusted using the Consumer Price Index (CPI). 1 Gas prices are reported in 2012 dollars and represent yearly averages. 2 Real per capita income is measured as total statewide personal income in 2012 dollars divided by state population. 3 Based on one-year estimates from the American Community Survey, commuting rates are of workers age 16 and older. 4 Ridership means the number of boardings, also called unlinked passenger trips. 5 Based on below 70% of posted speed. 6 Based on maximum throughput speed threshold (85% of posted speed). 7 MT^3I greater than one means the commute route experiences congestion. 8 2008 data not available for four of the 52 routes. For more information see gray box in the 2009 *Congestion Report*, p. 15.

The WSDOT's Core Philosophy: Maximizing System Capacity

WSDOT uses maximum throughput as the basis for system performance measurement

WSDOT uses maximum throughput as the basis for congestion performance measurement. To operate the highway system as efficiently as possible, the speed at which the highest number of vehicles can move through a highway segment (maximum throughput) is more meaningful than posted speed as the basis of measurement.

Maximum throughput is achieved when vehicles travel at speeds between 42 and 51 mph (roughly 70% to 85% of a posted 60 mph speed). At maximum throughput speeds, highways are operating at peak efficiency because more vehicles are passing through the segment than at posted speeds. This happens because drivers at maximum throughput speeds can safely travel with a shorter distance between vehicles than they can at posted speeds.

WSDOT aims to provide and maintain a system that yields the most productivity and efficiency, rather than a system that is free flowing but where fewer vehicles can pass through a segment during peak travel periods.

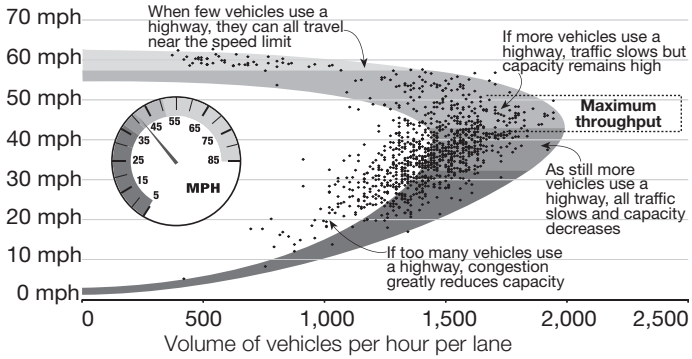
WSDOT is building on this existing maximum throughput core philosophy (as mentioned above) for vehicle travel to expand its application to multiple travel modes. This takes into account the capacity available on other modes along with that of the highway system with an aim to maximize person throughput.

As part of this effort WSDOT is incorporating multi-modal performance measurement to define system performance and available capacity across all modes. Towards this end, WSDOT is introducing new performance measures with an emphasis on person-based metrics to supplement the existing transportation system analysis. The multi-modal congestion performance measurement now includes:

- Transit-oriented performance measures, such as total ridership, cars off the road, and transit capacity used along the high-demand commute corridors.
- Greenhouse gas emissions (pounds of CO_2) per person during peak periods on commute corridors.
- Person-based measures, such as person miles traveled and person hours of delay in traffic (statewide, urban area, and corridor based) along with the per person trip travel time on commute corridors.

Understanding maximum throughput: An adaptation of the speed/volume curve

I-405 NB at 24th NE, (6-10 a.m.) weekday volume in May 2010
Speed limit 60 mph; Maximum throughput speed ranges between 70% and 85% of posted speed



Data source: WSDOT Northwest Region Traffic Office.

Maximum throughput speeds vary from one highway segment to the next depending on prevailing roadway design (roadway alignment, lane width, slope, shoulder width, pavement conditions, presence or absence of median barriers) and traffic conditions (traffic composition, conflicting traffic movements, heavy truck traffic, etc.). The maximum throughput speed is not static and can change over time as conditions change. Ideally, maximum throughput speeds for each highway segment should be determined through comprehensive traffic studies and validated by field surveys. For surface arterials (interrupted flow facilities), maximum throughput speeds are difficult to predict because they are influenced by interruptions in flow due to the conflicting traffic movements at intersections.

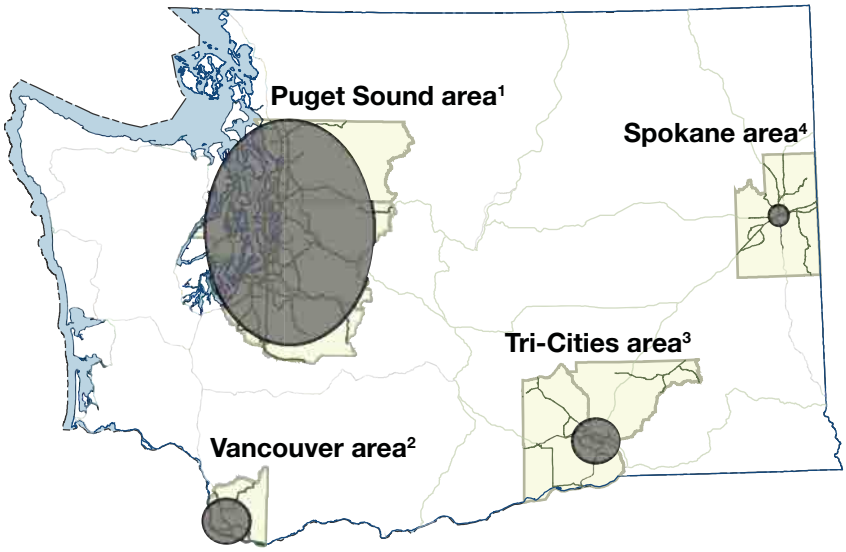
WSDOT uses the maximum throughput standard as a basis for measurement to assess travel delay relative to a highway's most efficient condition at maximum througput speeds (85% of posted speed). For more information on changes in travel delay performance, please see the 2013 *Corridor Capacity Report,* pp. 32-34.

WSDOT also uses maximum throughput as a basis for evaluating the system through the following measures:

- Total delay and per person delay
- Percent of highway lanemiles delayed and/or congested
- Lost throughput productivity
- Maximum Throughput Travel Time Index—MT^3I
- Duration of the congested period
- Commute congestion cost

Statewide Transportation System Congestion Indicators

Proportional representation of statewide delay distribution on the state highway system
2010 and 2012; Delay estimates for major urban areas; Size of the shaded area illustrates delay magnitude



Puget Sound area[1]
123,000 daily hours of delay in 2010
120,680 daily hours of delay in 2012
97.6% of statewide delay

Vancouver area[2]
630 daily hours of delay in 2010
640 daily hours of delay in 2012
0.5% of statewide delay

Tri-Cities area[3]
620 daily hours of delay in 2010
564 daily hours of delay in 2012
0.5% of statewide delay

Spokane area[4]
390 daily hours of delay in 2010
310 daily hours of delay in 2012
0.3% of statewide delay

Data source: WSDOT Urban Planning Office.
Notes: Symbols showing amount of congestion for urban areas are not directly proportional and are meant to be illustrative of relative amounts of delay. The four urban areas account for 98.9% of statewide delay. The other 1.1% occurs on roadsoutside of these defined areas. 1 Puget Sound area includes Snohomish, Kitsap, King and Pierce counties. 2 Vancouver area includes Clark county. 3 Tri-Cities area includes Benton and Franklin counties. 4 Spokane area includes Spokane county.

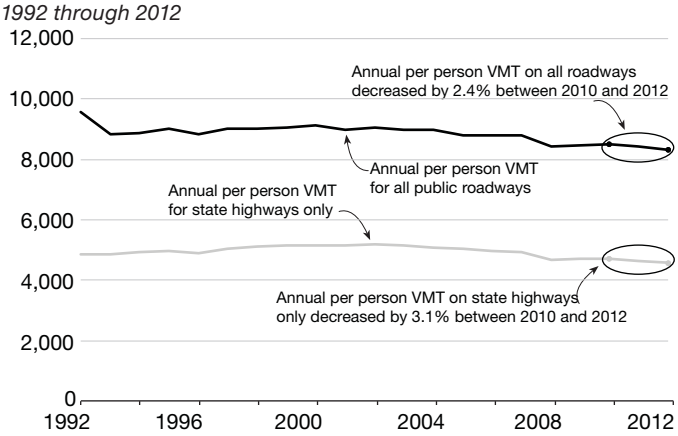
Per person vehicle miles traveled hit lowest levels in Washington since 1988

Per person (per capita) vehicle miles traveled (VMT) decreased for the third year in a row. In 2012, per person VMT hit a record low of 8,303 miles annually on all public roads and 4,578 on state highways; these are the lowest observed per person VMT values in the past quarter century. This does not mean the VMT is at its lowest, but rather the 2012 ratio between VMT and statewide population is the lowest recorded since 1988.

The VMT on all public roads shows the average Washingtonian drove 202 fewer miles in 2012 than in 2010, and 114 fewer miles than in 2011. Similarly, for VMT exclusively on state highways, Washingtonians drove 146 fewer miles in 2012 than in 2010 and 70 fewer miles than in 2011.

The per person VMT on all public roads decreased by 2.4% between 2012 and 2010. A similar trend was observed between 2012 and 2011, with a 1.4% decrease in per person VMT. The per person VMT measured exclusively for state highways showed a decrease of 3.1% in 2012 compared to 2010. The graph below, left shows the annual per person VMT trend since 1992.

Annual per-person vehicle miles traveled hit record low
1992 through 2012



Data source: Statewide Travel and Collision Data Office (STCDO), Washington State Office of Financial Management.

Per person annual hours of delay decreased 4.3%
Between 2010 and 2012, per-person vehicle hours of delay on state highways saw a 12 minute decrease, from 4 hours and 42 minutes in 2010 to 4 hours and 30 minutes in 2012.

For more details on statewide delay and factors affecting congestion see the 2013 *Corridor Capacity Report*, pp. 32-36.

Per-person annual hours of delay decreased 4.3%
2007 through 2012; Annual delay in hours

Urban areas/Year	2007	2008	2009	2010	2011	2012	2012 vs 2010
Puget Sound	9.5	9.3	7.4	8.3	8.6	8.1	-2.4%
Spokane	0.2	0.2	0.1	0.2	0.1	0.2	0.0%
Tri-Cities	0.3	0.3	0.4	0.6	0.6	0.5	-16.7%
Vancouver	0.4	0.4	0.6	0.4	0.3	0.4	0.0%
Statewide	**5.4**	**5.3**	**4.2**	**4.7**	**4.8**	**4.5**	**-4.3%**

Data source: WSDOT Urban Planning Office, Washington State Office of Financial Management.

Central Puget Sound area I-5 corridor performance

Annual miles traveled per person[1]

2007	2010	2012	
4,973	4,901	4,955	1%
Baseline	in miles traveled		2010 vs. 2012

Annual delay[2] per person

2007	2010	2012	
6.8	4.4	6.4	45%
Baseline	in hours of delay		2010 vs. 2012

Annual emissions per person

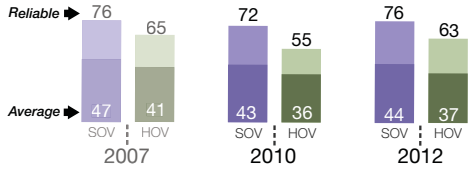
2007	2010	2012	
N/A	5,022	4,986	1%
Baseline	in pounds of CO_2		2010 vs. 2012

Commute trip travel times

Average and Reliable[3] travel times in minutes; For single occupancy vehicle (SOV) trips and high occupancy vehilce (HOV) trips; Peak period transit ridership; Average percent of transit seats occupied

Everett to Seattle morning commute

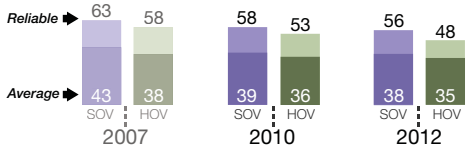
Weekdays; 5-10 a.m.; Trip length 24 miles; Travel times in minutes



2012 **5,770** peak period transit ridership
63% of seats occupied on average

Seattle to Everett evening commute

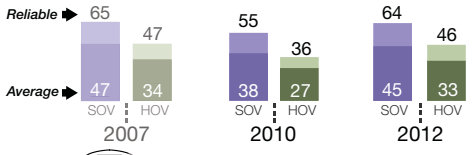
Weekdays; 2-8 p.m.; Trip length 23 miles; Travel times in minutes



2012 **5,650** peak period transit ridership
62% of seats occupied on average

Federal Way to Seattle morning commute

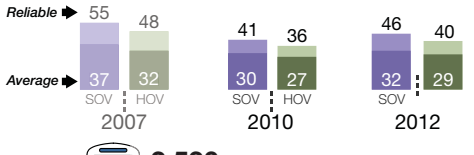
Weekdays; 5-10 a.m.; Trip length 22 miles; Travel times in minutes



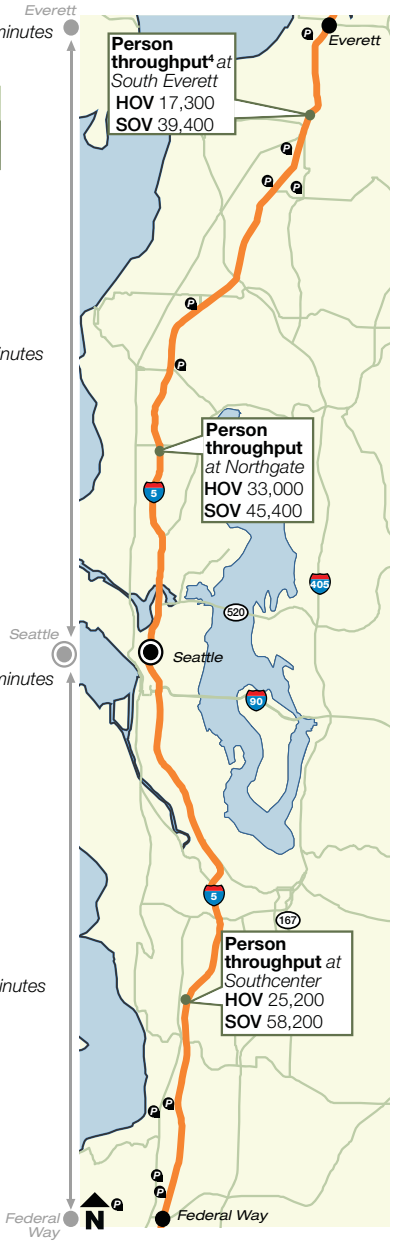
2012 **2,710** peak period transit ridership
81% of seats occupied on average

Seattle to Federal Way evening commute

Weekdays; 2-8 p.m.; Trip length 22 miles; Travel times in minutes

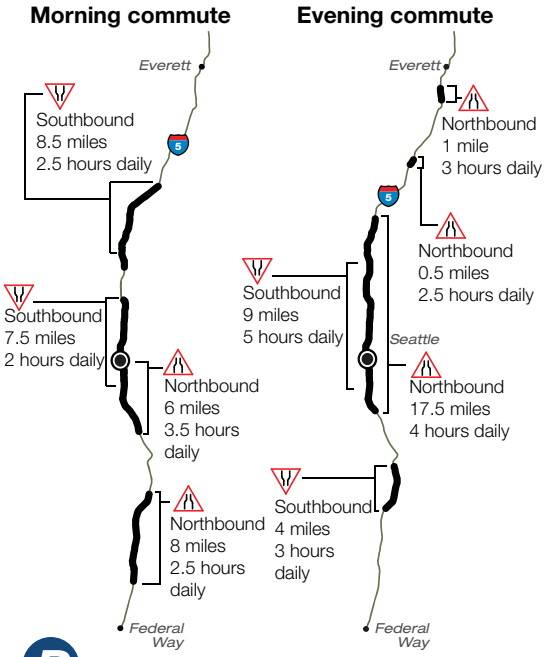


2012 **2,530** peak period transit ridership
77% of seats occupied on average



Routinely congested segments

2012; Weekday morning and evening peak periods (5-10 a.m. and 2-8 p.m.); Direction of travel; Length in miles; Duration of congestion in hours



Park and ride capacity[5]

2012; Parking spaces and average percent occupied

Everett-Seattle commute route

Park and ride	Spaces	Percent occupied
Everett Station	1,107	75%
Mariner P&R	644	75%
S. Everett Freeway Station	397	97%
Ash Way P&R	1,022	100%
Lynnwood Transit Center	1,378	100%
Mountlake Terrace P&R	869	95%
Kenmore area	693	92%
Northgate area	1,024	99%

Federal Way-Seattle commute route

Park and ride	Spaces	Percent occupied
Lakewood area	1,093	69%
Sumner train station	286	100%
Puyallup area	583	93%
Tacoma Dome station	2,283	95%
Federal Way area	2,067	75%
Auburn area	634	99%
Kent area	996	98%
Tukwila area	915	98%

Created in partnership with

Data source: Washington State Transportation Center at the University of Washington, WSDOT Urban Planning Office, WSDOT Strategic Assessment Office, Sound Transit, King County Metro, Community Transit

Notes: Per person, all day annual metrics at the top of the page are for the entire I-5 central Puget Sound area corridor between Everett and Federal Way. "Transit" includes bus, light rail, and commuter rail. 1 Per person refers to commuters on the road, excluding transit. Miles traveled per person is vehicle miles traveled on I-5 during weekdays multiplied by average car occupancy. 2 Delay is when vehicles travel below 85% of posted speed limits. 3 Reliable travel time is the travel time that will get a commuter to their destination 19 out of 20 times or 95% of the time. 4 Person throughput is the sum of people using all HOV and SOV lanes from 6-9 a.m. and 3-7 p.m. in the peak direction of the commute at a point location. 5 Only includes capacity for selected park and rides. Lakewood, Auburn, and Puyallup area not shown on map.

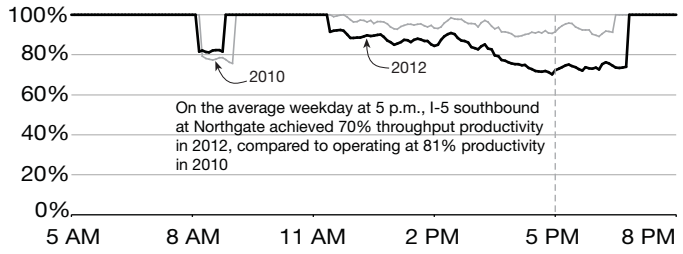
I-5 corridor performance story - central Puget Sound area

Interstate 5 (I-5) in the central Puget Sound area is one of several corridors that experience heavy congestion during morning and evening commute hours on a daily basis. Between 2010 and 2012, "per-person hours of delay" on the I-5 corridor increased 45% from 4 hours and 24 minutes in 2010, to 6 hours and 24 minutes in 2012. This means an average commuter spent an additional 2 hours on the road over the course of 2012, compared to 2010. However, the corridor did not see any significant changes in "person-miles traveled" or emissions per person in the same timeframe.

I-5 corridor productivity analysis:

Highway productivity: As traffic increases, a road is able to carry fewer vehicles; the result is a drop in the road's productivity. In order to gauge the lost productivity on the I-5 corridor, throughput was analyzed at six selected locations along the corridor (northbound and southbound at Northgate, I-90, and South 188th Street). In 2012, productivity at these locations ranged between 70% and 84%. For example, I-5 at Northgate in the southbound direction saw a productivity loss of 30% at 5 p.m. during the evening peak period, meaning that almost a third of the roadway's capacity was unavailable due to congestion. This lost productivity could be recovered if the roadway could be operated more efficiently. This location lost an additional 6% of its productivity when compared to 2010. For more details on the I-5 corridor productivity analysis, see the 2013 *Corridor Capacity Report*, pp. 38-40.

Southbound I-5 at NE 103rd Street (Northgate)
Based on highest observed five-minute flow rate; 1,745 vphpl



Data source: WSDOT Urban Planning Office.

Transit capacity: Transit carries several thousand people along the I-5 corridor each day during peak commute periods. Buses, Link light rail, and commuter rail have transit capacity based on the number of occupied seats. Transit utilization rates along the I-5 corridor vary between 62% and 81% during peak periods. During the peak transit hours (6-9 a.m. and 3-6 p.m.) there is frequently standing-room only on the most heavily-used buses.

Park and ride capacity: Availability of park and ride (P&R) locations within the transit service network is integral to transit ridership on express routes in the central Puget Sound area. P&R locations need to have enough parking spaces to accommodate transit demand. On the I-5 corridor between Federal Way and Everett, the Federal Way transit center, Lynnwood transit center and Ash Way P&R recorded 100% utilization of the available P&R capacity. The other P&R locations (listed on the previous page) also recorded relatively high utilization rates. For more P&R lot details see: www.wsdot.wa.gov/choices/parkride.cfm

Capacity constraints along the I-5 corridor:
The I-5 corridor has numerous, prominent points of congestion that lengthen the existing commute trip time as shown on the map on the previous page. For example, the Federal Way to Seattle morning commute experiences two prominent bottlenecks that last 3 hours on average and extend for a total of 14 miles along this 22-mile trip. These locations contribute to significant congestion on the corridor and have only worsened since 2010. This is due in part to the recovering regional economy, construction on SR 99, and shifting traffic patterns caused by the SR 520 bridge toll.

Commute trip reliability and average travel times:
The most significant shift in travel times was a 12-minute increase on the Everett to Seattle afternoon commute via I-5. That works out to an additional hour each week for a typical commuter traveling Monday through Friday.

In 2012, the reliable travel time for trips between Everett and Seattle during the peak commute periods (95th percentile travel time - being on time 19 out of 20 times) was extended between 4 and 18 minutes compared to in 2010. However, trip reliability improved 3 minutes on both the SeaTac to Seattle morning commute and Seattle to Everett evening commute. For more details, see the 2013 *Corridor Capacity Report*, pp. 42-56.

So, how much is congestion costing you?
In 2012, the commute congestion cost incurred by each person on the I-5 corridor, for a round trip to and from work, ranged from $400 to $1,500 per year. For Everett to Seattle, the annual round trip cost due to congestion (wasted time and gas) was $1,500 per person. For a household of two commuters this means a total of $3,000 extra each year in transportation related costs and time.

Central Puget Sound area I-405 corridor performance

Annual miles traveled per person[1]

2007	2010	2012	
3,295	3,327	3,283	1%
Baseline	in miles traveled		2010 vs. 2012

Annual delay[2] per person

2007	2010	2012	
7.2	5.1	5.8	14%
Baseline	in hours of delay		2010 vs. 2012

Annual emissions per person

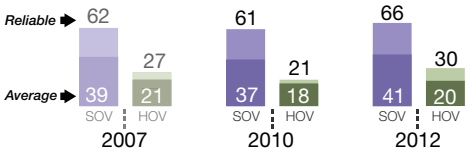
2007	2010	2012	
N/A	4,162	4,092	2%
Baseline	in pounds of CO_2		2010 vs. 2012

Commute trip travel times

Average and Reliable[3] travel times in minutes; For single occupancy vehicle (SOV) trips and high occupancy vehicle (HOV) trips; Peak period transit ridership; Average percent of transit seats occupied

Lynnwood to Bellevue morning commute

Weekdays; 5-10 a.m.; Trip length 16 miles; Travel times in minutes

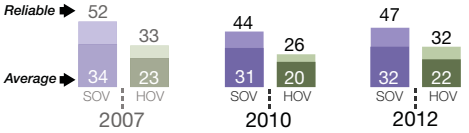


2012 **350** peak period transit ridership

71% of seats occupied on average

Bellevue to Lynnwood evening commute

Weekdays; 2-8 p.m.; Trip length 16 miles; Travel times in minutes

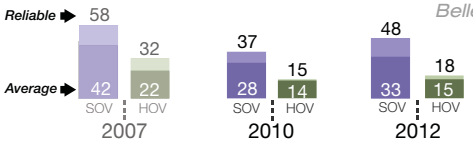


2012 **370** peak period ridership

58% of seats occupied on average

Tukwila to Bellevue morning commute

Weekdays; 5-10 a.m.; Trip length 13 miles; Travel times in minutes

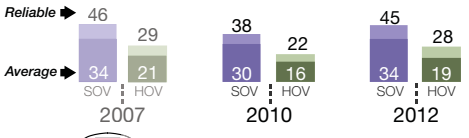


2012 **240** peak period transit ridership

66% of seats occupied on average

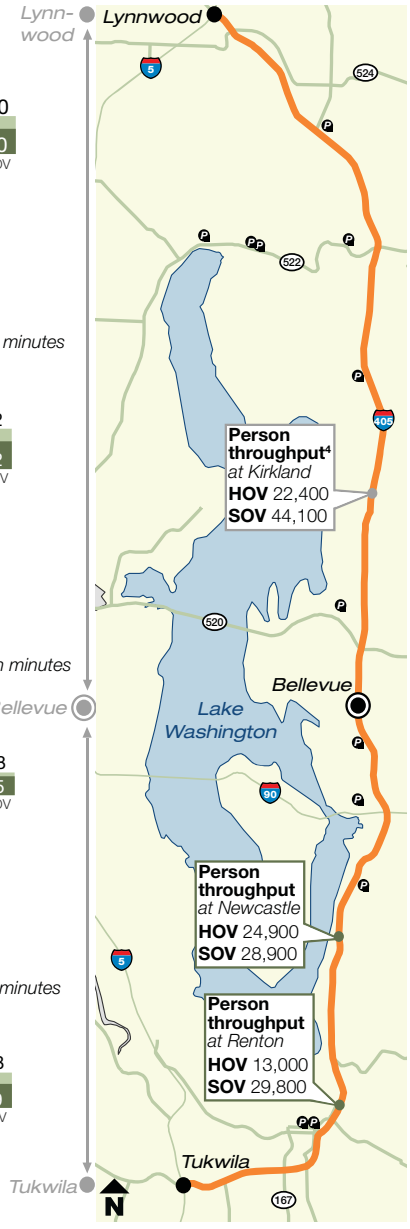
Bellevue to Tukwila evening commute

Weekdays; 2-8 p.m.; Trip length 13 miles; Travel times in minutes



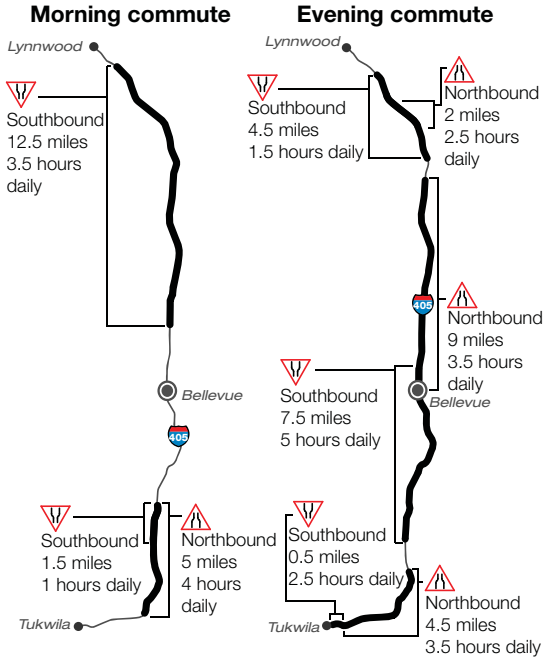
2012 **330** peak period transit ridership

78% of seats occupied on average



Routinely congested segments

2012; Weekday morning and evening peak periods (5-10 a.m. and 2-8 p.m.); Direction of travel; Length in miles; Duration of congestion in hours



Park and ride capacity[5]

2012; Parking spaces and average percent of spaces occupied

Lynnwood-Bellevue commute route

Park and ride	Spaces	Percent occupied
Ash Way P&R	1,022	100%
Canyon Park P&R	302	98%
Kenmore area	693	92%
Brickyard P&R	443	80%
Bothell P&R	220	99%
South Kirkland P&R	325	100%

Tukwila-Bellevue commute route

Park and ride	Spaces	Percent occupied
Wilburton P&R	186	82%
South Bellevue P&R	519	100%
Newport Hills	275	72%
Renton P&R	150	96%
Renton City Municipal P&R	200	90%

Created in partnership with

Data source: Washington State Transportation Center at the University of Washington, WSDOT Urban Planning Office, WSDOT Strategic Assessment Office, Sound Transit, King County Metro, Community Transit

Notes: Per person, all day annual metrics at the top of the page are for the entire I-405 central Puget Sound area corridor between Tukwila and Lynnwood. "Transit" includes bus, light rail, and commuter rail. 1 Per person refers to commuters on the road, excluding transit. Miles traveled per person is vehicle miles traveled on I-405 during weekdays multiplied by average car occupancy. 2 Delay is when vehicles travel below 85% of posted speed limits. 3 Reliable travel time is the travel time that will get a commuter to their destination 19 out of 20 times or 95% of the time. 4 Person throughput is the sum of people using all HOV and SOV lanes from 6-9 a.m. and 3-7 p.m. in the peak direction of the commute at a point location. 5 Only includes capacity for selected park and rides. Ash Way park and ride not shown on map.

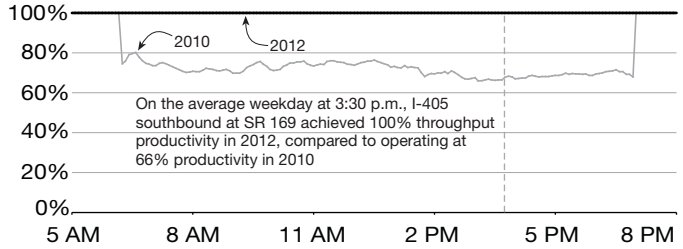
I-405 corridor performance story - central Puget Sound area

I-405 in the central Puget Sound area runs parallel to I-5 and is one of several corridors that experience heavy congestion during morning and evening commute hours on a daily basis. Between 2010 and 2012, "per-person hours of delay" on the I-405 corridor increased 14% from 5 hours and 6 minutes in 2010 to 5 hours and 48 minutes in 2012. This means an average commuter spent an additional 42 minutes on the road over the course of 2012, compared to 2010. However, the corridor did not see any significant changes in "person-miles traveled" or emissions in the same timeframe.

I-405 corridor productivity analysis:

Highway productivity: As traffic increases, a road is able to carry fewer vehicles; the result is a drop in the road's productivity. In order to gauge the lost productivity on the I-405 corridor, throughput was analyzed at four locations along the corridor (northbound and southbound at Renton, and Kirkland). In 2012, productivity at these locations ranged between 47% and 100%. For example, I-405 at SR 169 in Renton, in the southbound direction saw the greatest gain, achieving maximum vehicle throughput (black line in the graph below). The same location had continuous loss in vehicle throughput due to congestion in 2010 (gray line). Travel performance at that location benefited from WSDOT completing projects along the southern segment of I-405, including stages 1 and 2 of the I-405/I-5 to SR 169 project. That project added another single-occupancy vehicle lane in each direction between the I-5 Southcenter interchange and SR 169, as well as a new interchange to relieve congestion and improve access to and from the Renton area. See the 2011 *Congestion Report*, p. 60.

Southbound I-405 at SR 169 (MP 4.0)
Based on highest observed five-minute flow rate; 1,790 vphpl



Data source: WSDOT Urban Planning Office.

Transit capacity: Transit carries several hundred people along the I-405 corridor each day during peak commute periods. Transit capacity is based on the number of occupied seats. Transit utilization rates along the I-405 corridor vary between 58% and 78% during peak periods. During the transit peak hours (6-9 a.m. and 3-6 p.m.) there is frequently standing-room only on the most heavily-used buses.

Park and ride capacity: Availability of park and ride (P&R) locations within the transit service network is integral to transit ridership along express routes in the central Puget Sound area. P&R locations need to have enough parking spaces to accommodate transit demand. On the I-405 corridor between Tukwila and Lynnwood, the South Kirkland P&R, Ash Way P&R, and South Bellevue P&R recorded 100% utilization of the available capacity. The other P&R locations (listed on previous page) also recorded high utilization rates with Newport Hills being the lowest at 72%. For more P&R lot details see: www.wsdot.wa.gov/choices/parkride.cfm

Capacity constraints along I-405 corridor:
The I-405 corridor has numerous, prominent points of congestion that lengthen the existing commute trip time as shown on the previous page. For example, the Lynnwood to Bellevue morning commute experiences a 12.5-mile long backup between Damson Road and south of NE 70th Place that lasts more than 3 hours and 30 minutes on average for this 16-mile trip. The nine routinely congested segments contribute to significant congestion on I-405 and have only worsened since 2010. This is due in part to the recovering regional economy, construction on SR 99, and shifting traffic patterns caused by the SR 520 bridge toll.

Commute trip reliability and average travel times:
One of the significant shifts in travel times on I-405 was a 4-minute increase on the Lynnwood to Bellevue morning commute. That adds up to an extra 20 minutes each week for a typical commuter traveling Monday through Friday.

In 2012, 95th percentile reliable trip travel times on I-405 between Lynnwood and Tukwila grew between 3 and 11 minutes, compared to 2010 peak periods (95th percentile travel time means commuters can plan on being on time 19 out of 20 weekday trips). For more details, see the 2013 *Corridor Capacity Report,* pp. 42-56.

So how much is congestion costing you?
In 2012, the commute congestion cost incurred by each person on the I-405 corridor, for a round trip to and from work, ranged from $400 to $2,000 per year. The Lynnwood-Bellevue round trip claimed the highest annual cost due to congestion (wasted time and gas) per person, at $2,000. For a household of two commuters this means a total of $4,000 extra each year in transportation related costs and time.

Central Puget Sound area SR 520 corridor performance

Annual miles traveled per person[1]

2007	2010	2012	
1,426	1,196	1,035	13%
Baseline	in miles traveled		2010 vs. 2012

Annual delay[2] per person

2007	2010	2012	
3.1	1.9	0.4	79%
Baseline	in hours of delay		2010 vs. 2012

Annual emissions per person

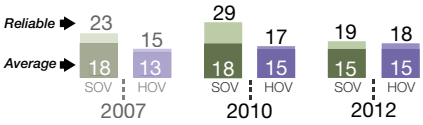
2007	2010	2012	
N/A	1,871	1,880	0.5%
Baseline	in pounds of CO_2		2010 vs. 2012

Commute trip travel times

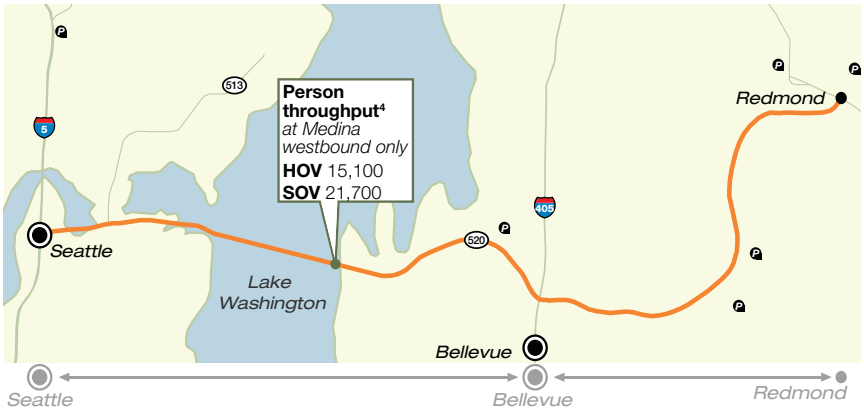
Average and Reliable[3] travel times in minutes; For single occupancy vehicle (SOV) trips and high occupancy vehicle (HOV) trips; Peak period transit ridership; Average percent of transit seats occupied

Bellevue to Seattle morning commute

Weekdays; 5-10 a.m.; Trip length 10 miles; Travel times in minutes

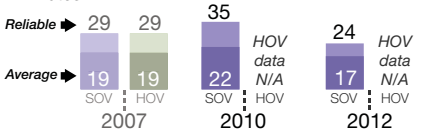


610 peak period transit ridership
52% of seats occupied on average



Seattle to Bellevue evening commute

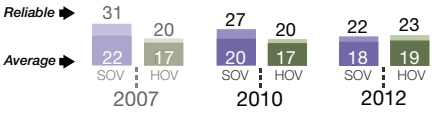
Weekdays; 2-8 p.m.; Trip length 10 miles; Travel times in minutes



1,390 peak period transit ridership
60% of seats occupied on average

Redmond to Seattle morning commute

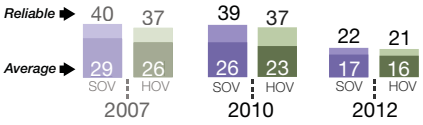
Weekdays; 5-10 a.m.; Trip length 13 miles; Travel times in minutes



2,330 peak period transit ridership
73% of seats occupied on average

Seattle to Redmond evening commute

Weekdays; 2-8 p.m.; Trip length 13 miles; Travel times in minutes

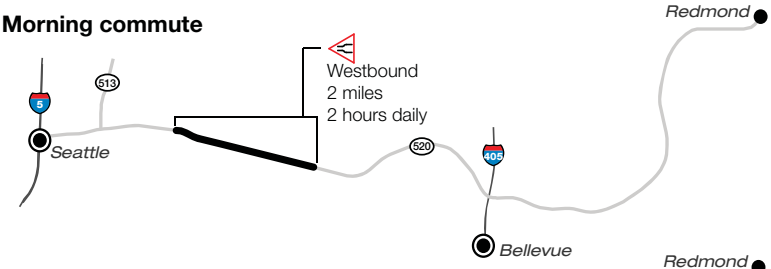


2,480 peak period transit ridership
70% of seats occupied on average

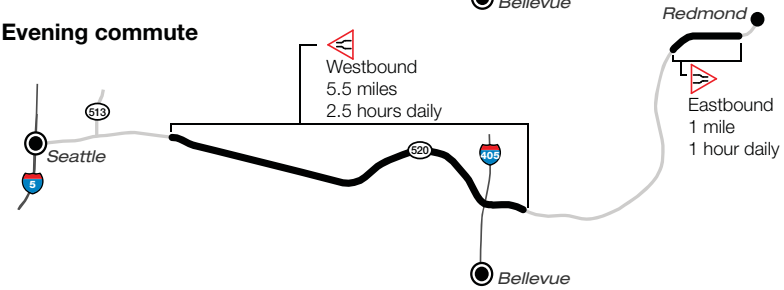
Routinely congested segments

2012; Weekday morning and evening peak periods (5-10 a.m. and 2-8 p.m.); Direction of travel; Length in miles; Duration of congestion in hours

Morning commute



Evening commute



Park and ride capacity[5]

2012; Parking spaces and average percent of spaces occupied

Seattle-Bellevue commute route

Park and ride	Spaces	Percent occupied
South Kirkland P&R	325	100%
Greenlake P&R	411	93%

Redmond-Bellevue commute route

Park and ride	Spaces	Percent occupied
Overlake Transit Center	222	100%
Overlake P&R	203	41%
Redmond P&R	377	91%
Bear Creek P&R	283	100%

Created in partnership with

Data source: Washington State Transportation Center at the University of Washington, WSDOT Urban Planning Office, WSDOT Strategic Assessment Office, Sound Transit, King County Metro, Community Transit

Notes: Per person, all day annual metrics at the top of the page are for the entire SR 520 central Puget Sound area corridor between Redmond and Seattle. "Transit" includes bus, light rail, and commuter rail. No HOV lane is availalbe on SR 520 eastbound between I-5 and I-405. 1 Per person refers to commuters on the corridor. Miles traveled per person is vehicle miles traveled on SR 520 multiplied by average car occupancy. 2 Delay is when vehicles travel below 85% of posted speed limits. 3 Reliable travel time is the travel time that will get a commuter to their destination 19 out of 20 times or 95% of the time. 4 Person throughput is the sum of people using all HOV and SOV lanes from 6-9 a.m. and 3-7 p.m. in the peak direction of the commute at a point location. 5 Only includes capacity for selected park and rides.

SR 520 corridor performance story - central Puget Sound area

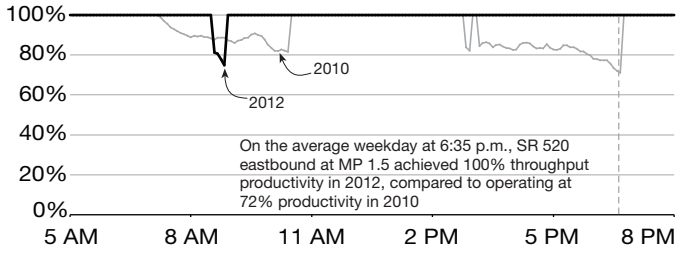
State Route (SR) 520 in the central Puget Sound area was the most congested corridor until the start of tolling in December 2011. SR 520 runs parallel to I-90 across Lake Washington. Between 2010 and 2012, "per-person hours of delay" on the SR 520 corridor decreased 79% from 1 hour and 54 minutes in 2010 to 24 minutes in 2012. This means an average commuter saved 1 hour and 30 minutes on the road over the course of 2012, compared to 2010 using the tolled roadway. Similarly, as a result of tolling "person-miles traveled" decreased 13% on the corridor while there were no significant changes in emissions per person.

SR 520 corridor productivity analysis:

Highway productivity: As traffic increases, a road is able to carry fewer vehicles; the result is a drop in the road's productivity. In order to gauge the lost productivity on the SR 520 corridor, throughput was analyzed at two locations along the corridor (eastbound and westbound at Montlake). In 2012, productivity at these locations ranged between 75% and 100%. For example, eastbound SR 520 at 6:35 p.m. had productivity 28% below maximum throughput in 2010, compared to 100% productivity in 2012. Similarly, the westbound direction had 100% vehicle throughput in 2012, up from 95% in 2010. For more details on the SR 520 corridor productivity analysis, see the 2013 *Corridor Capacity Report*, pp. 38-40.

Eastbound SR 520 at Evergreen Point Floating Bridge (MP 1.5)

Based on highest observed five-minute flow rate; 1,710 vphpl



Data source: WSDOT Urban Planning Office.

Transit capacity: Transit carries several thousand people along the SR 520 corridor each day during peak commute periods. Transit capacity is based on the number of occupied seats. Transit utilization rates along the SR 520 corridor across Lake Washington vary between 52% and 73%. During the peak transit hours (6-9 a.m. and 3-6 p.m.) there is frequently standing-room only on the most heavily-used buses.

Park and ride capacity: Availability of park and ride (P&R) locations within the transit service network is integral to transit ridership along express routes in the central Puget Sound area. P&R locations need to have enough parking spaces to accommodate transit demand. On the SR 520 corridor between Seattle and Bellevue, the South Kirkland P&R and Greenlake P&R recorded 100% and 93% utilization of the available capacity, respectively. The P&R lots along SR 520 between Bellevue and Redmond experienced utilization rates ranging between 41% and 100%. For more P&R lot details see: www.wsdot.wa.gov/choices/parkride.cfm

Capacity constraints along SR 520 corridor:
The SR 520 corridor has three routinely congested segments that lengthen the existing commute trip time as shown on the previous page. For example, the SR 520 westbound evening commute from 124th Avenue NE to just after the western end of the floating bridge experiences congestion that extended 5.5 miles and lasted 2 hours and 30 minutes.

Commute trip reliability and average travel times:
SR 520 tolling resulted in improved average and reliable travel times for most of the commute trips that use SR 520. SR 520 commute trips generally experienced noticeably faster average peak travel times in 2012 compared to 2010: the morning commute saw 10% to 17% faster westbound trips, and 28% to 35% faster eastbound trips, while the evening commute saw 6% to 16% faster westbound trips, and 20% to 35% faster eastbound trips. Similarly, reliable travel times on SR 520 also improved by 31% to 44%. For more details, see the 2013 *Corridor Capacity Report,* pp. 42-56.

So how much is congestion costing you?
In 2012, the commute congestion cost incurred by each person on the SR 520 corridor, for a round trip to and from work, ranged from $100 to $800 per year. The Seattle-Bellevue round trip annual cost due to congestion (wasted time and gas) per person was $800. For a household of two commuters this means a total of $1,600 extra each year in transportation related costs and time.

Toll rate displayed on overhead signs alert drivers to the current cost of crossing the SR 520 floating bridge

Central Puget Sound area I-90 corridor performance

Annual miles traveled per person[1]

2007	2010	2012		
1,535	1,718	1,672	3%	
Baseline	in miles traveled		2010 vs. 2012	

Annual delay[2] per person

2007	2010	2012		
0.6	0.5	0.8	70%	
Baseline	in hours of delay		2010 vs. 2012	

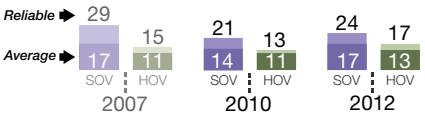
Annual emissions per person

2007	2010	2012		
N/A	2,219	1,963	12%	
Baseline	in pounds of CO_2		2010 vs. 2012	

Commute trip travel times

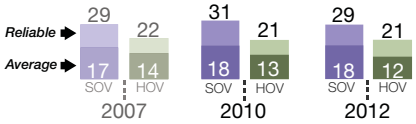
Average and Reliable[3] travel times in minutes; For single occupancy vehicle (SOV) trips and high occupancy vehicle (HOV) trips; Peak period transit boardings; Average percent of transit seats occupied

Bellevue to Seattle morning commute
Weekdays; 5-10 a.m.; Trip length 10 miles; Travel times in minutes



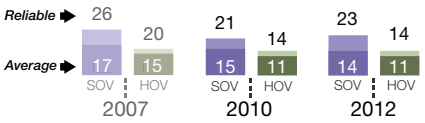
2,670 peak period transit ridership
82% of seats occupied on average

Seattle to Bellevue evening commute
Weekdays; 2-8 p.m.; Trip length 10 miles; Travel times in minutes



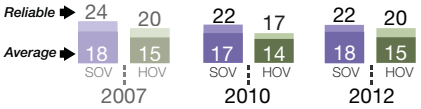
3,130 peak period transit ridership
83% of seats occupied on average

Issaquah to Bellevue morning commute
Weekdays; 5-10 a.m.; Trip length 9 miles; Travel times in minutes



510 peak period ridership
67% of seats occupied on average

Bellevue to Issaquah evening commute
Weekdays; 2-8 a.m.; Trip length 9 miles; Travel times in minutes

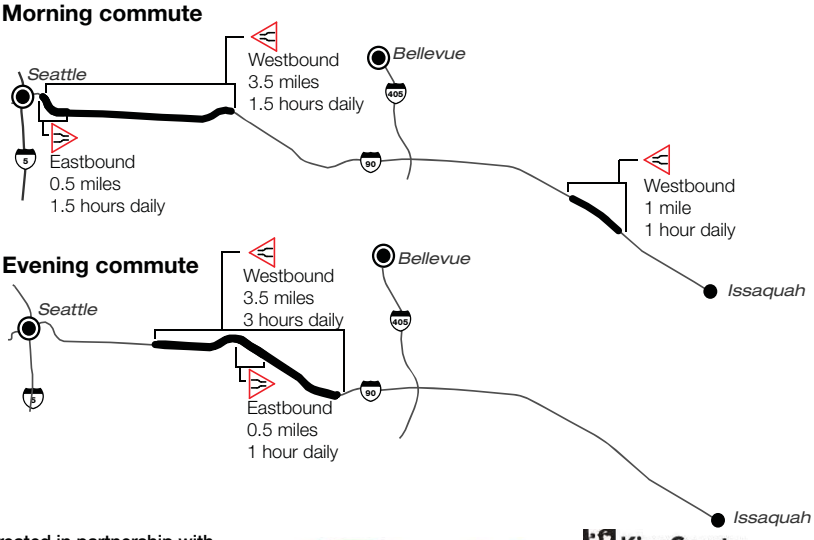


430 peak period transit ridership
60% of seats occupied on average

Routinely congested segments

2012; Weekday morning and evening peak periods (5-10 a.m. and 2-8 p.m.); Direction of travel; Length in miles; Duration of congestion in hours

Morning commute



Evening commute

Park and ride capacity[5]

2012; Parking spaces and average percent of spaces occupied

Seattle-Bellevue commute route

Park and ride	Spaces	Percent occupied
South Bellevue P&R	519	100%
Mercer Island P&R	447	100%

Issaquah-Bellevue commute route

Park and ride	Spaces	Percent occupied
Issaquah Highlands P&R	1,010	86%
Issaquah Transit Center	819	96%
Eastgate P&R	1,614	93%

Created in partnership with

Data source: Washington State Transportation Center at the University of Washington, WSDOT Urban Planning Office, WSDOT Strategic Assessment Office, Sound Transit, King County Metro, Community Transit

Notes: Per person, all day annual metrics at the top of the page are for the entire I-90 central Puget Sound area corridor between Issaquah and Seattle."Transit" includes bus, light rail, and commuter rail. 1 Per person refers to commuters on the corridor. Miles traveled per person is vehicle miles traveled on I-90 multiplied by average car occupancy. 2 Delay is when vehicles travel below 85% of posted speed limits. 3 Reliable travel time is the travel time that will get a commuter to their destination 19 out of 20 times or 95% of the time. 4 Person throughput is the sum of people using all HOV and SOV lanes from 6-9 a.m. and 3-7 p.m. in the peak direction of the commute at a point location. 5 Only includes capacity for selected park and rides. Issaquah Highlands park and ride not shown on map.

I-90 corridor performance story - central Puget Sound area

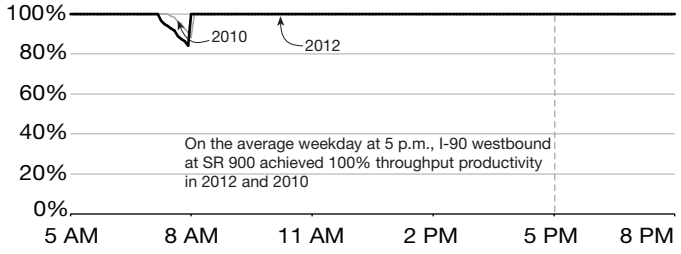
I-90 in the central Puget Sound area is one of several corridors that experience heavy congestion during morning and evening commute hours on a daily basis. I-90 and SR 520 run parallel to each other across Lake Washington between Seattle and Bellevue. Between 2010 and 2012, "per-person hours of delay" on the I-90 corridor increased 70% from 30 minutes in 2010, to 48 minutes in 2012. This means an average commuter spent an additional 18 minutes on the road over the course of 2012, compared to 2010. Even though the vehicle miles traveled and corridor traffic volume increased 4% and 7%, respectively, the "person-miles traveled" declined 3% in 2012 compared to 2010. Similarly, the corridor saw a 12% decline in emissions per-person, in the same timeframe.

I-90 corridor productivity analysis:

Highway productivity: As traffic increases, a road is able to carry fewer vehicles; the result is a drop in the road's productivity. In order to gauge the lost productivity on the I-90 corridor, throughput was analyzed at two locations along the corridor (eastbound and westbound at SR 900 in Issaquah). In 2012, productivity at these locations ranged between 84% and 100%. For example, I-90 in the eastbound direction had 100% productivity in 2010 and 2012. However, the westbound direction continues to see a slight loss (16%) in vehicle throughput in 2012. Tolling SR 520 did not impact vehicle throughput eastbound, while it contributed to a 4% decrease in vehicle throughput westbound in 2012 compared to 2010.

Westbound I-90 at SR 900 (MP 16.5)

Based on highest observed five-minute flow rate; 1,630 vphpl



Data source: WSDOT Urban Planning Office.

Transit capacity: Transit carries several thousand people along the I-90 corridor each day during peak commute periods. Transit capacity is based on the number of occupied seats. Transit utilization rates along the I-90 corridor vary between 60% and 83% during peak periods. During the peak transit hours (6-9 a.m. and 3-6 p.m.) there is frequently standing-room only on the most heavily-used buses.

Park and ride capacity: Availability of park and ride (P&R) locations within the transit service network is integral to transit ridership along express routes in the central Puget Sound area. P&R locations need to have enough parking spaces to accommodate transit demand. On the I-90 corridor between Seattle and Bellevue, the South Bellevue P&R and Mercer Island P&R recorded 100% utilization of the available capacity. The P&R lots along I-90 between Bellevue and Issaquah experienced utilization rates ranging between 86% and 96%. For more P&R lot details see: www.wsdot.wa.gov/choices/parkride.cfm

Capacity constraints along I-90 corridor:

The I-90 corridor has five prominent points of congestion that lengthen the existing commute trip time as shown on the previous page. Three of the five congested segments are in the westbound direction while two shorter segments form in the eastbound direction. For example, during the 10-mile long Bellevue to Seattle morning commute, backups extend 3.5 miles along the I-90 floating bridge and last on average 1 hour and 30 minutes daily. The same commute during the evening peak period experiences a 3.5-mile long backup in the Mercer Island area extending to the western portion of the floating bridge that lasts for 3 hours on average weekdays. The three routinely congested westbound segments contribute to significant congestion on I-90. This is due in part to the recovering regional economy and shifting traffic patterns caused by the SR 520 bridge toll.

Commute trip reliability and average travel times:

The westbound trips using I-90 across Lake Washington were slower in 2012 than in 2010, as some travelers chose to divert to I-90 (non-tolled option) for cross-lake travel. The morning travel times to Seattle on I-90 grew by 20% over the two-year period, while evening commute travel times to Seattle were up 8%. WSDOT completed the Two-Way Transit and HOV Operations project, which extended the eastbound HOV lane to 80th Avenue Southeast in the middle of Mercer Island. This project resulted in additional capacity and slight travel time improvements during the eastbound morning and evening commutes from Seattle using I-90. For more details, see the 2013 *Corridor Capacity Report*, pp. 42-56.

So how much is congestion costing you?

In 2012, the commute congestion cost incurred by each person on the I-90 corridor, for a round trip to and from work, ranged from $600 to $1,000 per year. The Bellevue-Seattle round trip annual cost due to congestion (wasted time and gas) per person was $1,000. For a household of two commuters this means a total of $2,000 extra each year in transportation related costs and time.

Central Puget Sound area SR 167 corridor performance

Annual miles traveled per person[1]

2007	2010	2012	
2,198	2,348	2,383	2%
Baseline	in miles traveled		2010 vs. 2012

Annual delay[2] per person

2007	2010	2012	
2.6	1.6	1.8	10%
Baseline	in hours of delay		2010 vs. 2012

Annual emissions per person

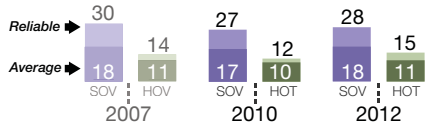
2007	2010	2012	
N/A	2,320	2,285	2%
Baseline	in pounds of CO_2		2010 vs. 2012

Commute trip travel times

Average and Reliable[3] travel times in minutes; For single occupancy vehicle (SOV) trips and high occupancy toll (HOT) trips; Peak period transit ridership; Average percent of transit seats occupied

Auburn to Renton morning commute

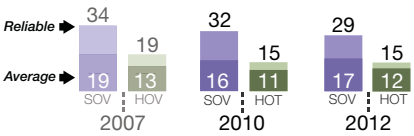
Weekdays; 5-10 a.m.; Trip length 10 miles; Travel times in minutes



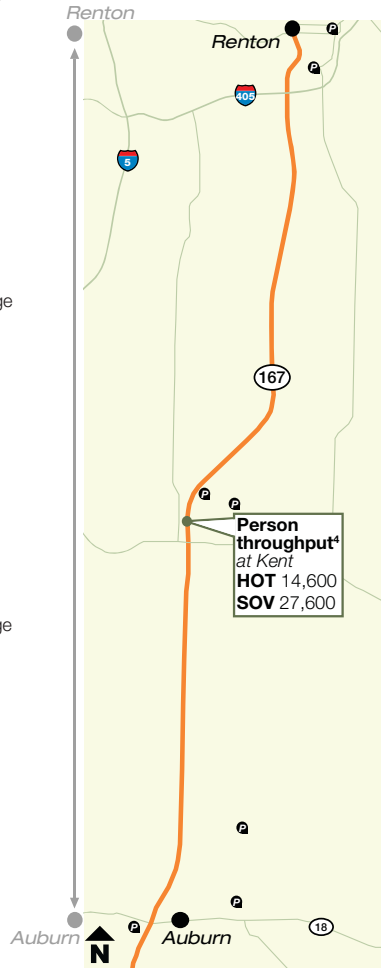
380 peak period transit ridership
51% of seats occupied on average

Renton to Auburn evening commute

Weekdays; 2-8 p.m.; Trip length 10 miles; Travel times in minutes



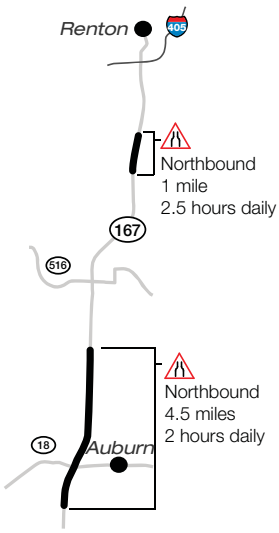
410 peak period transit ridership
41% of seats occupied on average



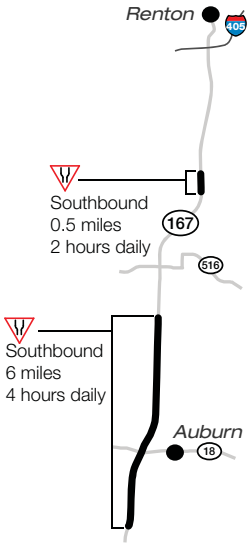
Routinely congested segments

2012; Weekday morning and evening peak periods (5-10 a.m. and 2-8 p.m.); Direction of travel; Length in miles; Duration of congestion in hours

Morning commute



Evening commute



Park and ride capacity[5]

2012; Parking spaces and average percent of spaces occupied

Auburn-Renton commute route

Park and ride	Spaces	Percent occupied
Auburn Station	634	99%
Auburn P&R	358	48%
Kent/James St P&R	713	21%
Kent Station	996	97%
Peasley Canyon P&R	54	89%
Renton Municipal Garage	200	90%
Renton P&R	150	96%
South Renton P&R	373	98%

Created in partnership with

Data source: Washington State Transportation Center at the University of Washington, WSDOT Urban Planning Office, WSDOT Strategic Assessment Office, Sound Transit, King County Metro, Community Transit

Notes: Per person, all day annual metrics at the top of the page are for the entire SR 167 central Puget Sound area corridor between Auburn and Renton. "Transit" includes bus, light rail, and commuter rail. 1 Per person refers to commuters on the corridor. Miles traveled per person is vehicle miles traveled on SR 167 multiplied by average car occupancy. 2 Delay is when vehicles travel below 85% of posted speed limits. 3 Reliable travel time is the travel time that will get a commuter to their destination 19 out of 20 times or 95% of the time. 4 Person throughput is the sum of people using all HOV and SOV lanes from 6-9 a.m. and 3-7 p.m. in the peak direction of the commute at a point location. 5 Only includes capacity for selected park and rides.

SR 167 corridor performance story - central Puget Sound area

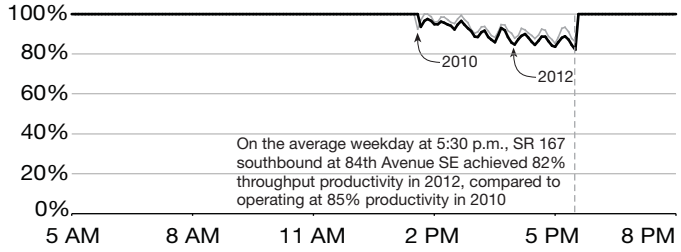
SR 167 in the central Puget Sound area is an extension to I-405 and runs between Renton and Auburn. The SR 167 high occupancy toll (HOT) lanes are high occupancy vehicle (HOV) lanes open to solo drivers who choose to pay a toll. Drivers who opt to use the HOT lanes save time and reduce the stress associated with their daily commute, while also reducing the volume of the traffic in the single-occupancy vehicle (SOV) lanes.

Between 2010 and 2012, "per-person hours of delay" on the SR 167 corridor increased 10% from 1 hour and 36 minutes in 2010 to 1 hour and 48 minutes in 2012. This means an average commuter spent an additional 12 minutes on the road in 2012, compared to 2010. "Person-miles traveled" and emissions per person each changed by 2%.

SR 167 corridor productivity analysis:

Highway productivity: As traffic increases, a road is able to carry fewer vehicles; the result is a drop in the road's productivity. In order to gauge the lost productivity on the SR 167 corridor, throughput was analyzed at two locations along the corridor (northbound and southbound at 84th Avenue SE). In 2012, productivity at these locations ranged between 82% and 89%. For example, SR 167 at 84th Avenue SE in the southbound direction saw a productivity loss of 18% at 5:30 p.m. during the evening peak period, 3% worse than in 2010. This productivity could be recovered if the roadway could be operated more efficiently. For more details on the SR 167 corridor productivity analysis, see the 2013 *Corridor Capacity Report*, pp. 38-40.

Southbound SR 167 at 84th Avenue SE (MP 21.5)
Based on highest observed five-minute flow rate; 1,620 vphpl



Data source: WSDOT Urban Planning Office.

Transit capacity: Transit carries several hundred people along the SR 167 corridor each day during peak commute periods. Transit capacity is based on the number of occupied seats. Transit utilization rates along the SR 167 corridor vary between 41% and 51% during peak periods.

Park and ride capacity: Availability of park and ride (P&R) locations within the transit service network is integral to transit ridership. P&R locations need to have enough parking spaces to accommodate transit demand. On the SR 167 corridor between Auburn and Renton, the majority of P&R lots have utilization rates close to 90% or more of the available capacity. For more P&R lot details see: www.wsdot.wa.gov/choices/parkride.cfm

Capacity constraints along SR 167 corridor:
Even though the implementation of high occupancy toll (HOT) lanes on the SR 167 corridor greatly improved corridor performance there are still four prominent points of congestion that lengthen the existing commute trip time as shown on the previous page. For example, the southbound evening commute experiences a 6-mile backup between the Green River bridge and SR 18 that lasts 4 hours on an average weekday.

Commute trip reliability and average travel times:
In 2012, the northbound HOT lane saved weekday drivers an average of 7 minutes of travel time during the peak period. Average travel time in the HOT lane was 11 minutes compared to 18 minutes in the SOV lanes. The weekday southbound HOT lane saved drivers 5 minutes during the evening peak, with average travel times of 12 minutes in the HOT lane and 17 minutes in the SOV lane.

The 95th percentile reliable travel time in the HOT lanes is 15 minutes, while the SOV trip takes 28 minutes from Auburn to Renton in the morning and 29 minutes from Renton to Auburn in the evening. This means that drivers who carpool or pay a toll to use the HOT lane can leave with just about half the time for their trip and still arrive early or on time for 19 of 20 weekday trips compared to those who use the SOV lanes for the same trip. For exclusive SR 167 HOT lane analysis, see the 2013 *Corridor Capacity Report*, p. 79.

So how much is congestion costing you?
In 2012, the commute congestion cost incurred by each person on the SR 167 corridor, for a round trip between Auburn and Renton, was $700 per person annually. For a household of two commuters this means a total of $1,400 extra each year in transportation related costs and time.

Toll rate displayed on overhead signs alert drivers to the current cost of using the SR 167 HOT lanes as a solo driver. High occupancy vehicles can always use the lanes for free.

South Puget Sound area I-5 corridor performance

Annual miles traveled per person[1]

2007	2010	2012	
11,231	11,352	11,400	0.4%
Baseline	in miles traveled		2010 vs. 2012

Annual delay[2] per person

2007	2010	2012	
11	18	17	6%
Baseline	in hours of delay		2010 vs. 2012

Delay per person mile traveled

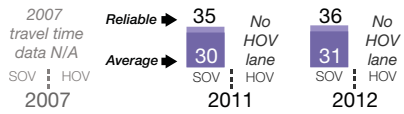
2007	2010	2012	
3.1	5.0	4.7	6%
Baseline	in seconds		2010 vs. 2012

Commute trip travel times

Average and Reliable[3] travel times in minutes

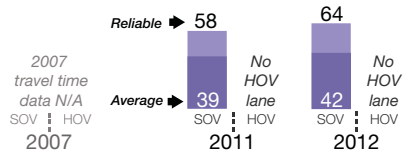
Olympia to Tacoma morning commute

Weekdays; 5-10 a.m.; Trip length 27 miles; Travel times in minutes



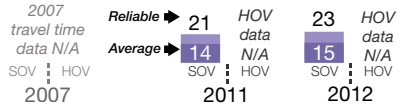
Tacoma to Olympia evening commute

Weekdays;2-8 p.m.; Trip length 28 miles; Travel times in minutes



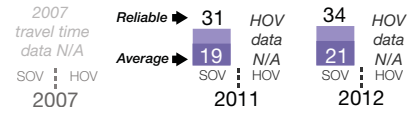
Tacoma to Federal Way morning commute

Weekdays;5-10 a.m.; Trip length 11 miles; Travel times in minutes



Federal Way to Tacoma Evening commute

Weekdays;2-8 p.m.; Trip length 9 miles; Travel times in minutes



Park and ride capacity[4]

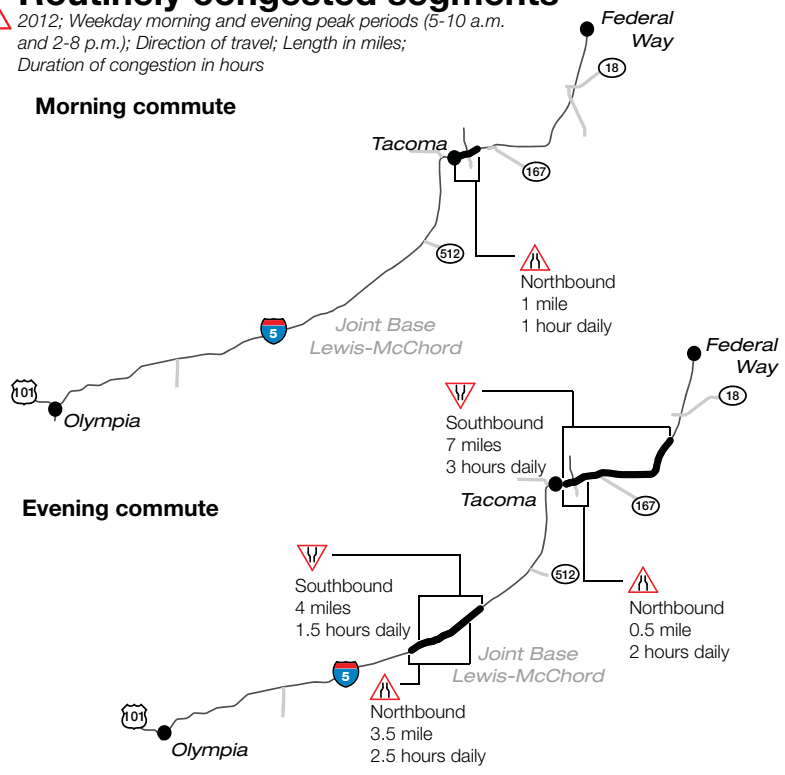
2012; Parking spaces and average percent of spaces occupied

Olympia-Federal Way commute route

Park and ride	Spaces	Percent occupied
Martin Way P&R	318	50%
Hawks Prairie P&R	332	15%
DuPont P&R	125	60%
Lakewood Station	600	48%
SR 512 lakewood P&R	493	93%
Tacoma Dome Station	2,273	96%

Routinely congested segments

2012; Weekday morning and evening peak periods (5-10 a.m. and 2-8 p.m.); Direction of travel; Length in miles; Duration of congestion in hours



Created in partnership with INTERcity TRANSIT

Data source: Washington State Transportation Center at the University of Washington, WSDOT Strategic Assessment Office, WSDOT Olympic Region, Intercity Transit

Notes: Per person, all day annual metrics at the top of the page are for the entire I-5 south Puget Sound area corridor between Olympia and Federal Way. "Transit" includes bus, light rail, and commuter rail. 1 Per person refers to commuters on the road, excluding transit. Miles traveled per person is vehicle miles traveled on I-5 during weekdays multiplied by average car occupancy. 2 Delay is when vehicles travel below 85% of posted speed limits. 3 Reliable travel time is the travel time that will get a commuter to their destination 19 out of 20 times or 95% of the time. 4 Only includes capacity for selected park and rides.

I-5 corridor performance story - south Puget Sound area

This report for the first time includes travel time trends for the south Puget Sound area. This addition expands the existing coverage of the central Puget Sound area for a more comprehensive understanding of statewide commute trends. The I-5 commuting corridor for the south Puget Sound area is the 38-mile stretch between Olympia and Federal Way, divided into smaller segments based on the job centers in the area.

The corridor experiences moderate to heavy congestion during the evening commute period on a daily basis. Between 2011 and 2012, "per-person hours of delay" on this section of the I-5 corridor decreased 6% from 18 hours in 2011 to 17 hours in 2012. This means an average commuter spent one hour less on the road in 2012, compared to 2011. A 6% reduction was observed in delay per person miles traveled. However, the corridor did not see any significant changes in "person-miles traveled."

In 2012, delay on the I-5 corridor in the central Puget Sound and in the south Puget Sound area were similar in terms of the vehicle hours of delay experienced on a daily basis (around 10,000 vehicle hours of delay). However, daily traffic volumes on I-5 in the central Puget Sound area (approximately 334,000) are much higher than in the south Puget Sound area (135,000). Thus, the delay per person is higher in the south Puget Sound area.

Capacity constraints along I-5 corridor:
The I-5 corridor has prominent points of congestion that lengthen the existing commute trip time as shown on the previous page. For example, the congestion through the Joint Base Lewis-McChord (JBLM) has made headlines in the recent past due to unprecedented traffic jams experienced in 2010 after Labor Day. Leaders from WSDOT, JBLM administrators, Washington State Patrol (WSP) and local municipalities formed the Traffic Circulation Committee to identify and resolve traffic operations issues. The initial efforts of this committee were successful in creating interim congestion relief. However, more efforts are on the way to handle the JBLM congestion issues. For more details, see the 2012 *Congestion Report*, pp. 63-65.

In 2012, the evening commute through JBLM experienced congestion in both northbound and southbound directions. Congestion northbound extended 3.5 miles between Steilacoom DuPont Road and Thorne Lane; it lasted about 2 hours and 30 minutes. Similarly, southbound in the evening congestion extended 3 miles and lasted for an hour.

One other prominent congestion location is between the King-Pierce county line and Portland Avenue in Tacoma. This 7-mile segment experiences 3 hours of delay southbound on a daily basis. During the morning northbound commute, there is 1 hour of congestion for 1 mile between Pacific and Portland avenues.

Commute trip reliability and average travel times:
Travel times on 19 of 20 morning commutes on I-5 to and from cities between Olympia and Federal Way remained relatively steady, changing less than 2 minutes in 2012 compared to 2011. The evening commute on I-5 from Tacoma to Olympia saw a 3-minute increase in average travel time in 2012 compared to 2011.

The 95th percentile reliable travel time changed less than 2 minutes on 11 of the 20 routes. The other nine routes experienced travel time changes of more than 2 minutes during that period: seven of those routes saw longer reliable travel times, and two routes saw shorter reliable travel times. The largest deterioration in reliable travel time of 9 minutes was on the Lakewood to Lacey commute. The largest improvement of 4 minutes was on the evening commute northbound from Tacoma to Federal Way. For more details, see the 2013 *Corridor Capacity Report*, pp. 57-60.

Transit, park and ride:
Transit ridership on this stretch of I-5 was not included as part of the analysis. Starting next year, transit analysis is planned for this urban area. Park and ride (P&R) lot information is presented. P&R locations need to have enough parking spaces to accommodate transit demand. Availability of P&R locations within the transit service network is integral to transit ridership. On the I-5 corridor between Olympia and Federal Way, the Tacoma Dome station and SR 512 Lakewood P&R recorded utilization of more than 90% of the available capacity, while the other P&R locations recorded relatively lower utilization rates.

The Martin Way park and ride lot in Lacey serves commuters in the south Puget Sound area who are interested in sharing the ride.

Vancouver area I-5 and I-205 corridor performance

Annual miles traveled per person[1]

2007	2010	2012	
4,969	4,958	4,956	0%
Baseline	in miles traveled		2010 vs. 2012

Annual delay[2] per person

2007	2010	2012	
0.88	0.80	0.82	3%
Baseline	in hours of delay		2010 vs. 2012

Delay per person mile traveled

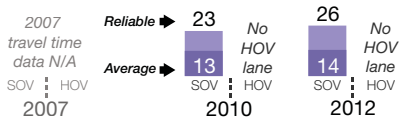
2007	2010	2012	
0.54	0.49	0.51	2%
Baseline	in seconds		2010 vs. 2012

Commute trip travel times

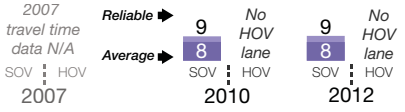
Average and Reliable[3] travel times in minutes

Interstate 5

I-205 to I-5 bridge morning commute
Weekdsays; 7-10 a.m.; Trip length 8 miles; Travel times in minutes

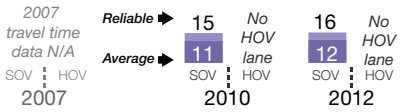


I-5 bridge to I-205 evening commute
Weekdays; 3-6 p.m.; Trip length 8 miles; Travel times in minutes

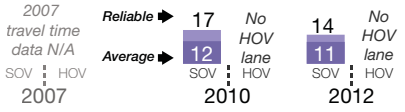


Interstate 205

I-5 to I-205 bridge morning commute
Weekdays; 7-10 a.m.; Trip length 11 miles; Travel times in minutes



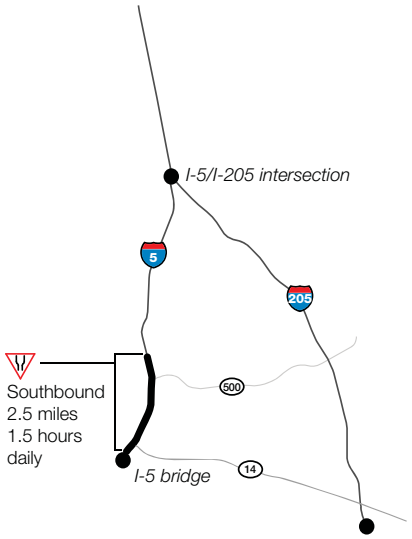
I-205 bridge to I-5 evening commute
Weekdays; 3-6 p.m.; Trip length 11 miles; Travel times in minutes



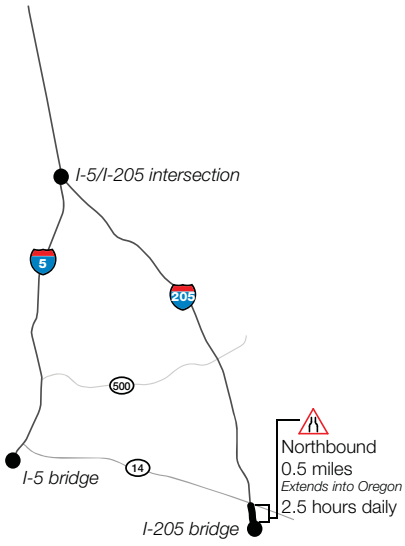
Routinely congested segments

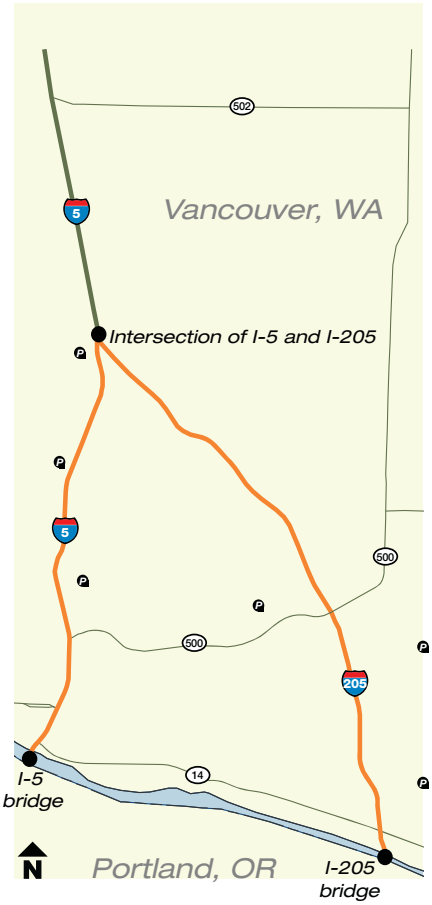
2012; Weekday morning and evening peak periods (7-10 a.m. and 3-6 p.m.); Direction of travel; Length in miles; Duration of congestion in hours

Morning commute



Evening commutes





Park and ride capacity[4]

2012; Parking spaces and average percent of spaces occupied

Interstate 5 commute route

Park and ride	Spaces	Percent occupied
Columbia House P&R	35	89%
BPA P&R	162	27%
99th Street Transit Center	488	56%
Salmon Creek P&R	563	37%

Interstate 205 commute route

Park and ride	Spaces	Percent occupied
Vancouver Mall Transit Center	N/A[5]	N/A[5]
Evergreen P&R	244	16%
Fisher's Landing Transit Center	428	76%
Living Hope Church P&R	60	N/A[5]

Created in partnership with Southwest Washington Regional Transportation Council

Data source: Starlab at the University of Washington, WSDOT Southwest Region Planning Office, WSDOT Strategic Assessment Office, Southwest Washington Regional Transportation Council

Notes: Per person, all day annual metrics at the top of the page are for the the Vancouver area which includes Clark County. 1 Per person refers to commuters on the road, excluding transit. Miles traveled per person is vehicle miles traveled on I-5 and I-205 during weekdays multiplied by average car occupancy. 2 Delay is when vehicles travel below 85% of posted speed limits. 3 Reliable travel time is the travel time that will get a commuter to their destination 19 out of 20 timesor 95% of the time. 4 Only includes capacity for selected park and rides. 5 Parking spaces also serve a private entity so total number or utilization for park and ride purposes is not available.

I-5 and I-205 corridor performance story - Vancouver area

For the first time this report includes travel time trends for the Vancouver-Portland metropolitan area for a more comprehensive understanding of statewide commute trends. The Vancouver-area commutes include an 8-mile stretch of I-5 between the I-5/I-205 junction down to the I-5 Columbia River Bridge, and the parallel I-205 route 11 miles long down to the Glenn Jackson Bridge. These sections of the I-5 and I-205 corridors are reported in smaller segments based on the commuting patterns in the area.

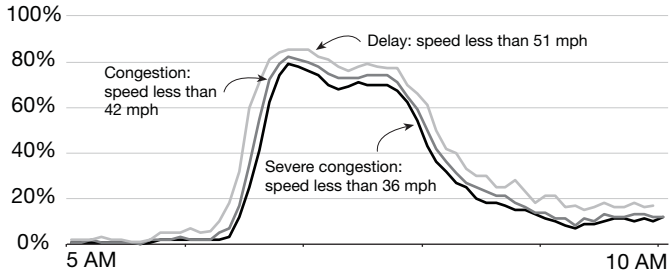
These Vancouver-area corridors experience moderate to heavy congestion during commute hours on a daily basis. Between 2010 and 2012, "per-person hours of delay" on the I-5 corridor increased 3% from 48 minutes in 2010 to 49 minutes in 2012. This means an average commuter spent an additional minute on the road each day over the course of 2012, compared to in 2010. Similarly, a 2% increase was observed in delay per person mile traveled. However, the corridor did not see any change in "person-miles traveled", in the same timeframe.

Capacity constraints along I-5 corridor:
The southbound I-5 Columbia River Bridge is the prominent point of congestion that lengthens the existing commute trip time to Oregon. The number of through lanes and posted speed limit are reduced as traffic approaches the I-5 bridge. In addition, there are closely spaced access points (weave between Mill Plain and SR 14) and short merge locations (SR 14 on-ramp). These route characteristics lead to a reduction in the capacity of the corridor. Congestion routinely occurs starting at the I-5 bridge, delaying southbound drivers, and causing a backup extending 2.5 miles north from the bridge and lasting for more than 1 hour and 30 minutes during the morning peak period.

The northbound I-5 Columbia River Bridge is a bottleneck during the evening peak direction, which creates congestion in Oregon for drivers heading into Washington.

Capacity constraints along I-205 corridor:
The I-205 corridor experiences congestion in the evening peak period (3-6 p.m.) at the off-ramp to SR 14 due to the high volume of northbound traffic exiting to SR 14 eastbound. The tight curve of this ramp (advisory speed 30 mph posted) inherently reduces its capacity compared to a typical ramp. Even if the ramp did not have this tight curve, the demand would require an additional lane to accommodate the number of vehicles exiting I-205. The length of the queue extends beyond the state line and lasts 2 hours and 30 minutes.

I-5 morning commute from SR 500 to the I-5 bridge
Percent of weekdays delayed or congested in 2012



Data source: Private sector speed data provided through WSDOT Southwest Region Planning.

Some other congestion locations in the Vancouver area that are not displayed on the previous page are important but do not have significant congestion durations: I-205/ SR 500 to Padden Parkway, I-205 southbound on-ramp from SR 500, I-205 northbound off-ramp to SR 500.

Commute trip reliability and average travel times:
Commuters traveling from Vancouver to Portland on I-5 during the morning (7-10 a.m.) peak period experience travel times more than twice as long as during free-flowing conditions. At the peak of the morning commute (7:40 a.m.), it took an average of 7 minutes (at a speed of about 17 mph) in both 2010 and 2012 to drive the two-mile southbound trip on I-5 from SR 500 to the I-5 Columbia River Bridge. This congestion is caused by the narrow I-5 bridge, the congestion created by the on-ramp near the approach to the bridge and the ingress points between SR 500 and the I-5 Columbia River Bridge.

For the I-205 evening commute, VMT increased 4% between 2010 and 2012 on the northbound section of I-205 between the Glenn Jackson Bridge and the interchange with I-5. This increase is due to typical growth and possible diversion of drivers to I-205 to avoid the congestion south of the I-5 bridge. For more details, see the 2013 *Corridor Capacity Report*, pp. 61-62.

Transit, park and ride:
Transit ridership on this stretch of I-5 and I-205 is planned to be included in next year's report. Park and ride (P&R) lot information is presented. These locations need to have enough parking spaces to accommodate transit demand. On the I-5 corridor between the I-5/I-205 junction down to the I-5 Columbia River Bridge, the Columbia House P&R and 99th Street Transit Center have utilization rates of 89% and 56% respectively. Similarly, on the I-205 corridor Fisher's Landing Transit Center has a utilization rate of 76%, while the Evergreen P&R recorded 16% utilization rate.

Marine highways performance - Washington State Ferries

Annual ridership[1]

	2010	2012
passengers	12.35	12.23
vehicles	10.10	9.98

1% ↓

in millions of passengers and vehicles

Annual trip reliability[2]

2010	2012
99.6%	99.5%

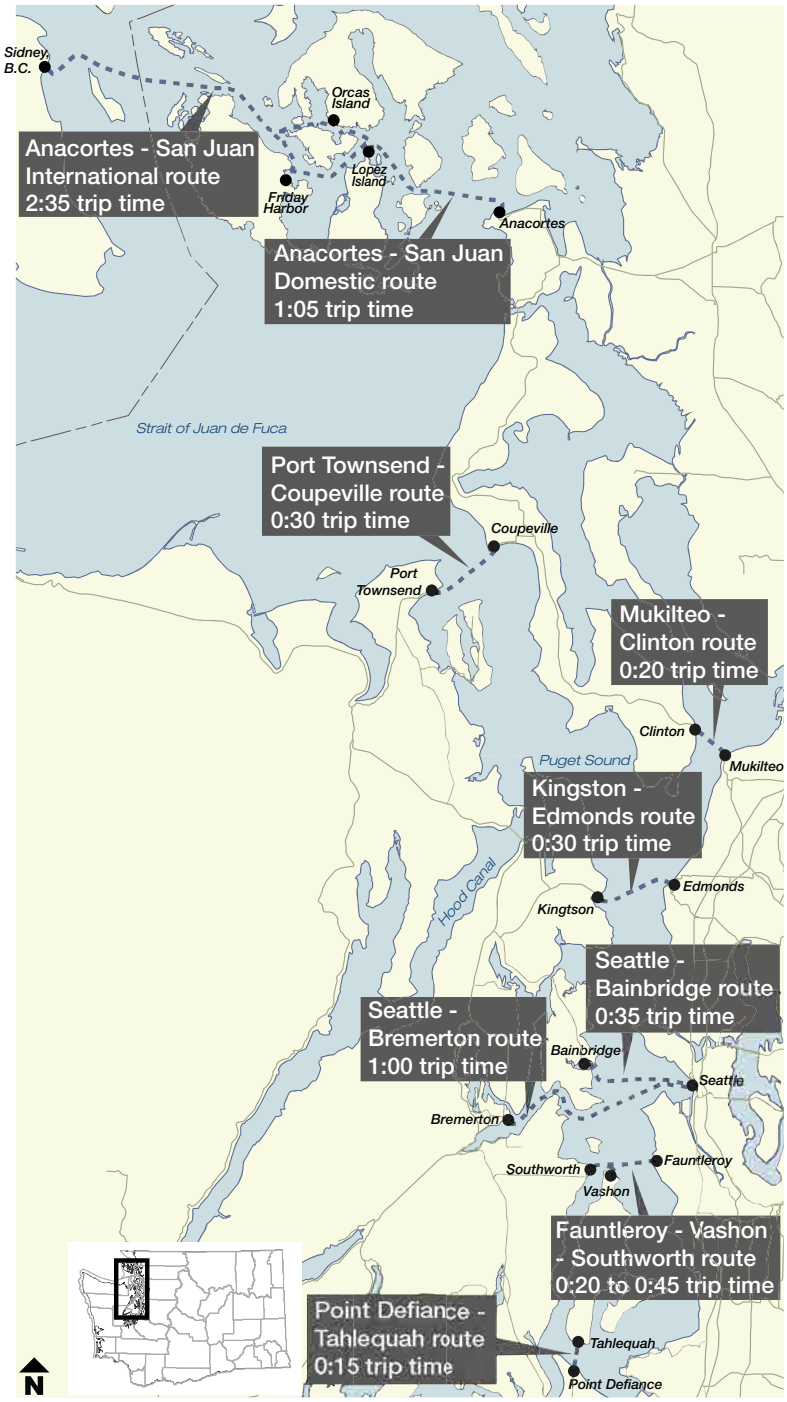
0.1% ↓

of scheduled trips sailed

Annual fuel usage + use per service mile

FY2010[3]	FY2012		FY2010	FY2012
17.21	17.47	2% ↑ 1% ↓	19.6	19.3

in millions of gallons | in gallons per mile



On-time[4] performance by route

2010 and 2012; Annual percent of trips that departed on time; Goal: 95% of trips depart on time annually

Ferry route

Route	2010	2012	Δ
Anacortes - San Juan domestic	83.2%	88.0%	4.8%
Anacortes - San Juan - Sidney, B.C.	82.2%	88.8%	6.6%
Edmonds - Kingston	89.1%	99.3%	10.2%
Fauntleroy - Vashon - Southworth	87.4%	95.6%	8.2%
Mukilteo - Clinton	92.6%	98.7%	6.1%
Point Defiance - Tahlequah	89.3%	99.4%	10.1%
Port Townsend - Coupeville	87.2%	93.3%	6.1%
Seattle - Bainbridge	89.6%	97.3%	7.7%
Seattle - Bremerton	92.7%	97.9%	5.2%
System-wide	**88.4%**	**95.7%**	**7.3%**

Ferry route capacity[5]

As of August 2013; Number of cars and passengers allowed per route on a weekday based on cumulative daily average capacity of vessels serving the route

Ferry route

Route	Passengers	Vehicles
Anacortes - San Juan domestic	68,708	5,900
Anacortes - San Juan - Sidney, B.C.	4,304	496
Edmonds - Kingston	109,000	9,388
Fauntleroy - Vashon - Southworth	120,308	11,313
Mukilteo - Clinton	93,600	9,672
Point Defiance - Tahlequah	28,500	2,432
Port Townsend - Coupeville	22,500	1,920
Seattle - Bainbridge	115,000	9,292
Seattle - Bremerton	47,200	4,000

Ferry trip travel times

Scheduled travel times by ferry route in hours and minutes

Ferry route

Route	Trip time
San Juan domestic	1:05
International route	2:35
Edmonds - Kingston	0:30
Fauntleroy - Vashon - Southworth[6]	0:20 to 0:45
Mukilteo - Clinton	0:20
Point Defiance - Tahlequah	0:15
Port Townsend - Coupeville	0:30
Seattle - Bainbridge	0:35
Seattle - Bremerton	1:00

Data source: WSDOT Ferries Division.

Notes: Data for the San Jaun inter-island route is combined with the San Juan domestic route. 1 Passenger ridership includes vehicle drivers and passengers, as well as walk-on passengers and bicyclists. 2 Trip reliability is the percent of scheduled sailings that sailed. 3 FY2010 stands for Fiscal Year 2010, starting July 1, 2009 and ending June 30, 2010. 4 A vessel is considered on time if it departs within 10 minutes of its scheduled departure. 5 Route capacity includes the cumulative capacity on all vessels serving that route. 6 Some trips are direct between two locations (with shorter trip times) and others serve all three locations.

Marine highway corridor performance story - Washington State Ferries

For the first time, WSDOT is including ferry service performance in the annual report on highway performance. The Washington State Ferries (WSF) service routes are defined as marine highways; they are integral links across the Puget Sound, connecting island and peninsula communities with the major employment centers on the mainland.

Annual ridership decreased 1%, with about 124,000 fewer passengers, and 126,000 fewer vehicles in 2012 than in 2010. The annual trip reliability decreased by 0.1%, meaning that there were slightly more canceled trips in 2012 than in 2010. However, the trip reliability system wide still met the goal of at least 99% of scheduled sailings being completed.

Fuel use is related to the number of sailings, the type and size of vessel, and route characteristics. The 2% increase in fuel use in 2012 was in part a result of adding a second boat to the Port Townsend - Coupeville route, and using the new, larger Kwa-di Tabil class Motor/Vessel (M/V) *Chetzemoka* on the Point Defiance – Tahlequah route, after the M/V *Rhododendron* was retired in January 2012. Fuel use per service mile decreased 1% between 2010 and 2012.

Marine highway corridor analysis:

On-time performance: There were more than 159,000 sailings in 2012, and while this is 640 fewer than in 2010, it still represents an impressive average of 435 sailings every day of the year. WSF strives to keep vessels sailing on time, with a goal of at least 95% of all sailings departing within 10 minutes of their scheduled departure. In 2012, on-time performance improved at least 4.8% on all routes, with a maximum improvement of 10.2% on the Edmonds – Kingston route. Six of the nine routes surpassed the goal of at least 95% of their sailings departing on time in 2012, while in 2010, the highest on-time performance was 92.7%.

Ferry route capacity: WSF owns and operates 22 ferry vessels, serving nine routes, with stops at 19 ferry terminals in Washington and one in Sidney, B.C. Seven of the nine ferry routes are served by at least two vessels – typically operating simultaneously in order to keep terminal wait times low. The route capacity is defined as the cumulative passenger and vehicle capacities of each vessel serving a particular route.

During the peak summer season, three vessels serve as maintenance spares, ready to replace a vessel that is taken out of service for planned or emergency maintenance. The replacement vessels may have a reduced capacity compared to the vessel typically serving a route. Another capacity constraint relates to staffing. The U.S. Coast Guard sets the number of crew required onboard for each vessel in order to sail. Some of the larger vessels could operate with fewer crew members during off-peak sailings on some routes, by closing the upper level passenger decks to reduce capacity. These scenarios illustrate that the capacity on a route may fluctuate.

Ridership by route: Passenger and vehicle ridership increased on four routes by 1% to 27%. The largest ridership increase was on the Port Townsend – Coupeville route, which was restored to two-boat service in July 2011, resulting in 1,560 more trips made in 2012 than in 2010. The Anacortes – San Juan Islands route had 874 fewer trips made, but the ridership still increased 1% to 2%. This is likely due to the limited transportation options between the Islands and from the Islands to the mainland.

Ferries' ridership, number of trips annually, and trip reliability

2010 and 2012; Ridership in thousands; Annual reliability goal = 99%

	Ridership (passengers)			Ridership (vehicle and driver)			Number of trips (actual trips sailed)			System-wide reliability[1]		
Route	**2010**	**2012**	**%Δ**	**2010**	**2012**	**%Δ**	**2010**	**2012**	**Δ**	**2010**	**2012**	**Δ**
Anacortes – San Juan domestic	890	907	2%	836	848	1%	27,739	26,865	-874	99.7%	99.8%	0.1%
Anacortes – San Juan – Sidney, B.C.	79	87	10%	44	48	10%	736	756	20	100.0%	100.0%	0.0%
Edmonds – Kingston	1,917	1,783	-7%	2,157	2,025	-6%	17,600	17,066	-534	99.6%	100.0%	0.4%
Fauntleroy – Vashon – Southworth	1,231	1,212	-1%	1,709	1,674	-2%	41,061	40,960	-101	99.8%	99.4%	-0.4%
Mukilteo – Clinton	1,767	1,745	-1%	2,117	2,090	-1%	26,709	26,808	99	99.7%	99.8%	0.1%
Point Defiance – Tahlequah	274	267	-3%	376	383	2%	14,024	13,818	-206	99.9%	99.4%	-0.5%
Port Townsend – Coupeville	309	361	17%	255	323	27%	6,975	8,535	1,560	95.5%	96.9%	1.4%
Seattle – Bainbridge Island	4,026	4,178	4%	1,951	1,941	-1%	16,509	16,571	62	99.9%	100.0%	0.1%
Seattle – Bremerton	1,859	1,688	-9%	657	642	-2%	10,887	10,863	-24	99.9%	99.4%	-0.5%
Total	**12,350**	**12,227**	-1%	**10,101**	**9,975**	-1%	**162,240**	**162,242**	**2**	**99.6%**	**99.5%**	**-0.1%**

Data source: WSDOT Ferries Division.

Notes: Sum of routes may not equal total due to rounding. 1 Reliability is the percent of scheduled trips that sailed. "Δ" denotes change in a variable.

Spokane area I-90 corridor performance

Annual miles traveled per person[1]

2007	2011	2012	
12,113	12,170	11,946	2%
Baseline	in miles traveled		2010 vs. 2012

Annual delay[2] per person

2007	2011	2012	
0.79	1.08	0.86	21%
Baseline	in hours of delay		2010 vs. 2012

Delay per person mile traveled

2007	2011	2012	
0.20	0.27	0.22	21%
Baseline	in seconds		2010 vs. 2012

Commute trip travel times

Average and Reliable[3] travel times in minutes

Argonne Rd. to Division St. morning commute
Weekdays; 7-10 a.m.; Trip length 7.5 miles; Travel times in minutes

Division St. to Argonne Rd. evening commute
Weekdays; 3-6 p.m.; Trip length 7.5 miles; Travel times in minutes

Park and ride capacity[4]

2012; Parking spaces and average percent of spaces occupied

Argonne Rd.-Division St. commute route

Park and ride	Spaces	Percent occupied
Valley Transit Center	236	50%
Mirabeau Point P&R	198	86%
Liberty Lake P&R	120	100%

Created in partnership with Spokane Transit

Data source: Washington State Transportation Center at the University of Washington, WSDOT Eastern Region Traffic Office, Spokane Transit Authority, WSDOT Strategic Assessment Office.

Notes: Per person, all day annual metrics at the top of the page are for the the Spokane area which includes Spokane County. 1 Per person refers to commuters on the road, excluding transit. Miles traveled per person is vehicle miles traveled on I-90 during weekdays multiplied by average car occupancy. 2 Delay is when vehicles travel below 85% of posted speed limits. 3 Reliable travel time is the travel time that will get a commuter to their destination 19 out of 20 timesor 95% of the time. 4 Only includes capacity for selected park and rides. Liberty Lake park and ride is not shown on the map.

The I-90 corridor in Spokane experiences moderate congestion during commute hours on a daily basis. Between 2010 and 2012, "per-person hours of delay" on the I-90 corridor decreased 21% from 1 hour and 5 minutes in 2010 to 52 minutes in 2012. This means an average commuter spent 13 less minutes on the road in 2012, compared to 2010. A similar 21% decrease was observed in delay per person mile traveled. However, "person-miles traveled" decreased only 2% in this timeframe.

Capacity constraints along I-90 corridor: Congested conditions occur primarily at two locations westbound on I-90: The first bottleneck westbound is primarily due to backups at the Division Street off-ramp, which occasionally impedes mainline traffic during the morning and evening peak periods. The City of Spokane attempts to mitigate the backups by adjusting the traffic signal timing at the ramp terminal.

The second westbound backup occurs between the Freya off-ramp and Thor on-ramp. Traffic on the Freya off-ramp will occasionally back up onto I-90 causing weaving for mainline traffic. The weaving doesn't subside until after the Thor on-ramp traffic merges onto I-90. Currently, WSDOT is looking at options to realign the off-ramp to alleviate these backups. This bottleneck occurs during both morning and evening peak periods.

Commute trip reliability and average travel times: The average trip time westbound on I-90 in the morning increased 1% to almost 9 minutes, while the eastbound evening trip time increased 6% to nearly 10 minutes.

The 95th percent reliable trip time improved 18% in the morning from almost 14 minutes down to 11 minutes from 2011 to 2012, meaning commuters could leave 3 minutes later in 2012 than in 2011, while still ensuring they arrived early or on-time for 95% of their trips. The evening trip time reliability worsened 16% from 13 minutes to more than 15 minutes. Commuters needed to plan an extra 2 minutes to ensure they arrived on time. For more details, see the 2013 *Corridor Capacity Report*, p. 63.

Transit, park and ride: Transit ridership on this stretch of I-90 was not included as part of the analysis. Starting next year, transit analysis is planned for this urban area. Park and ride (P&R) lot information is presented. P&R locations need to have enough parking spaces to accommodate transit demand. The Liberty P&R utilization rate is 100% while Mirabeau Point P&R and Valley Transit Center utilization rates are 86% and 50%, respectively.

WSDOT manages traffic and incidents to keep drivers moving safely

SR 520 tolling funds bridge replacement and improves traffic flow; Transit ridership up

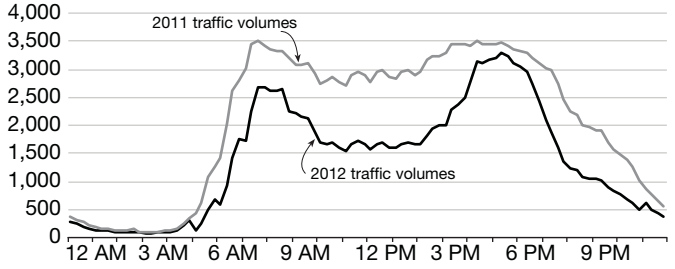
Tolling on the SR 520 bridge began December 29, 2011 to raise $1 billion in funding for the replacement bridge and reduce congestion on SR 520. The $4.13 billion SR 520 Bridge Replacement and HOV Program builds 12.8 miles of safety and mobility improvements from I-5 in Seattle to SR 202 in Redmond.

Changes in traffic volumes less than projected

An average of 68,000 vehicles crossed the SR 520 bridge each weekday in 2012, down from 103,000 in 2011. This 34% decrease in traffic is less than the 48% drop in SR 520 traffic volumes that was forecast for the first year of tolling.

Traffic volumes down on SR 520 after WSDOT implements tolling at the end of 2011

January 1, 2011 through December 31, 2012; Average traffic volume in vehicles per hour



Data source: WSDOT Northwest Region Traffic Office.

Revenue is on track to meet SR 520 funding needs

SR 520 traffic and revenue meet or exceed projections and are on track to raise more than $1 billion. About 20 million trips were taken during tolling hours (5 a.m. to 11 p.m.), generating $55 million in gross toll revenue in 2012.

SR 167 high occupancy toll (HOT) lanes

The first five years of the SR 167 high occupancy toll (HOT) lanes have yielded significant results, both for the drivers who access the HOT lanes and for those in the adjacent, non-tolled lanes. The number of tolled trips in the HOT lanes increased more than 10% from 3,800 trips in June 2012, to 4,200 trips a year later in June 2013.

HOT lanes result in faster travel times

Between July 2012 and June 2013, the northbound HOT lane saved weekday drivers an average of 9 minutes in the peak hour (7-8 a.m.) compared to travel in the SOV lanes. The average toll for single occupant vehicles to use the northbound HOT lane during the peak hour was $2.20. The southbound HOT lane saved drivers 6 minutes during the peak afternoon hour (4-5 p.m.); the average toll was $1.45.

Data shows Active Traffic Management is reducing collisions

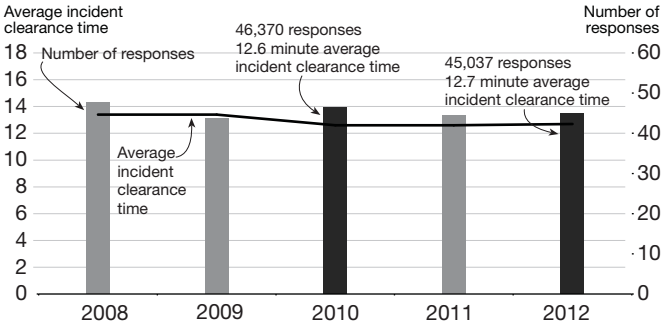
On August 10, 2010, WSDOT activated the state's first Smarter Highways infrastructure along the I-5 corridor northbound approaching Seattle. WSDOT is seeing a 25% reduction in the frequency of weekend collisions due to the presence of these Active Traffic Management (ATM) signs on I-5. Weekend drivers tend to be less familiar with the area and what traffic conditions to expect. The positive weekend results show that these drivers benefit significantly from the implementation of ATM. Weekday traffic saw a 7% reduction in collisions, showing that even for drivers accustomed to the corridor, advance warning of slow-downs or incidents helps them avoid secondary collisions.

Incident Response assists at 45,037 incidents

WSDOT's Incident Response (IR) program responded to 45,037 incidents in 2012, clearing scenes to get traffic moving in an average of 12.7 minutes. The IR team's assistance provided motorists in Washington approximately $70.7 million in estimated economic benefits by proactively preventing 8,610 secondary collisions and reducing the time and fuel wasted by drivers in delay through quickly clearing incidents. The IR program's annual budget was $4.5 million, making the program's estimated annual benefit to cost ratio 16:1 for 2012.

Number of incident responses down from 2010

2008 through 2012; Clearance time in minutes; Number of responses in thousands



Data source: Washington State Patrol, Washington Incident Tracking System (WITS).
Note: Data provided is only for incidents to which a WSDOT Incident Response team responded.

Blocking incidents cause more than half of delay costs

About 21.3% (9,599) of incidents in 2012 were blocking, meaning they closed down at least one lane of travel. The other 78.7% (35,438) were non-blocking incidents. However, blocking incidents caused 51%, or roughly $80.2 million, of incident-induced delay costs. Crews cleared blocking incidents in an average of 26.2 minutes and non-blocking incidents in an average of 9.2 minutes. For more detail on operational strategies, see the 2013 *Corridor Capacity Report*, pp. 78-84.

WSDOT project provide safety and mobility benefits to drivers

Redesigned I-5/SR 432 interchange improves access to industrial area near Kelso

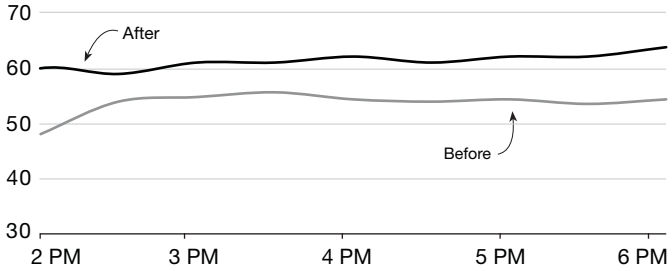
During 2010 and 2011, WSDOT reconstructed a pair of interchanges to alleviate weaving conditions between the ramps near Longview and Kelso in southwestern Washington. The interchanges provide connections between I-5, SR 432, and local roads including Talley Way, which serves a nearby industrial area.

Safety improves in the interchange vicinity: 23% fewer collisions per year

Collision data were evaluated for safety trends within the combined interchange areas. There were 104 reported collisions in the three years before construction (35 collisions per year), and 27 collisions in the one year of data available to date after construction. This represents a 23% decline in the number of collisions per year.

The graph below shows a difference in travel time of 0.2 minutes (13%) for eastbound travelers going to southbound I-5 during the evening commute (2-6 p.m.). The speed limit was reduced from 55 mph before construction to 45 mph during the analysis timeframe following construction. Travelers typically drove 54 mph before the speed limit changed; the average speed actually increased to 62 mph even though the speed limit dropped to 45 mph. Following the analysis of traffic volumes, travel speeds, and traffic safety, WSDOT returned the speed limit to 55 mph on mainline SR 432.

Average speed increases 8 mph eastbound on SR 432
2009 and 2012; Weekdays only; Evening peak period (2-6 p.m.)
mainline SR 432 traffic heading to I-5 southbound



Data source: WSDOT Traffic Office.
Note: Speed limit decreased from 55 mph to 45 mph

Added lanes and signalized intersection on SR 410 in Bonney Lake improve traffic flow

SR 410 runs from SR 167 (Puyallup/Sumner), through the city of Bonney Lake to SR 165 (Buckley). WSDOT completed a 1.49-mile project on SR 410 between the intersections of 214th Avenue East and 234th Avenue East, adding one lane to SR 410 in each direction with a raised median separating the eastbound and westbound traffic. The project also realigns the intersection at 234th Avenue East to create a four-way, signalized intersection at 233rd Avenue East.

Morning trip travel time on local road is more reliable

Local commuters northbound on 234th Avenue East turning left onto westbound SR 410 before construction were controlled by a stop sign, while SR 410 was free-flowing. The new signal at the realigned intersection with 233rd Avenue East improved traffic movements onto SR 410 westbound, and it did not add significant travel time (1.9 minutes before and after).

Evening trip travel time through Bonney Lake improves

Before construction, it took slightly less than 2 minutes to complete the evening trip (2-6 p.m.) through Bonney Lake eastbound on SR 410 at an average speed of 41 mph, which was below the 45 mph speed limit. After construction, the average speed increased to 45 mph, and travel times decreased 11%, even with a new traffic signal.

A flagger directs traffic during construction in 2010 to widen SR 410 and install a traffic signal at the intersection with 233rd Avenue East.

Redesigned I-5 ramp in Federal Way reduces congested conditions by 55%

From June through October 2011 WSDOT and the city of Federal Way worked to improve the southbound I-5 off-ramp to South 320th Street in Federal Way. Crews widened the ramp from three to five lanes, upgraded lighting, modified signal timing and built a retaining wall.

On mainline I-5 near the off-ramp to South 320th Street the minimum average speed of 42 mph occurred at 5 p.m. After the project completion, this minimum average speed increased by 18 mph to the posted speed of 60 mph on mainline I-5, showing that congestion on the ramp was no longer impacting mainline traffic flow. For more details, see the 2013 *Corridor Capacity Report*, pp. 85-88.

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The Washington State Department of Transportation has a vast amount of traveler information available. Current traffic and weather information is available by dialing 511 from most phones. The automated telephone system provides information on Puget Sound traffic conditions and travel times, statewide construction impacts, statewide incident information, mountain pass conditions, weather information, the state ferry system information, and phone numbers for transit, passenger rail, airlines and travel information systems in adjacent states and for British Columbia.

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