

Washington
Department of Transportation

The 2015 Corridor Capacity Report Appendix

For the 14th edition of the annual *Congestion Report*

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Lynn Peterson, Secretary of Transportation



WSDOT's comprehensive annual
analysis of multimodal state
highway system performance

Developed in
partnership with



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King County
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Puget Sound Regional Council
PSRC

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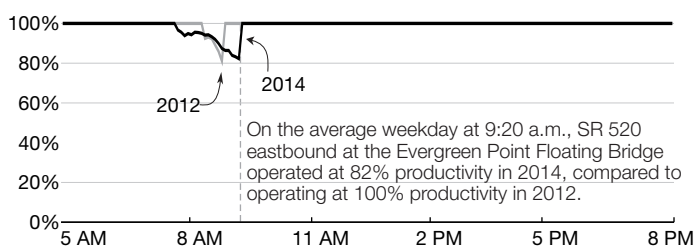
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How to read throughput and stamp graphs

Throughput productivity

Vehicle throughput measures how many vehicles move through a highway segment/spot location in an hour. Throughput productivity is measured as the difference between the highest observed average 5-minute flow rate during the year and the flow rate that occurs when vehicles travel slower than the maximum throughput speed (42 to 51 mph) observed at a particular location of the highway for that calendar year. Lost throughput productivity is the percentage of a highway's vehicle throughput lost due to congestion (see [pp. 5-6](#), [30](#), [37](#) and [41](#)).

Example: Throughput productivity on eastbound SR 520 at the Evergreen Point Floating Bridge 2012 and 2014; Based on the highest observed 5-minute flow rate; Eastbound = 1,600 vehicles per hour per lane = 100%



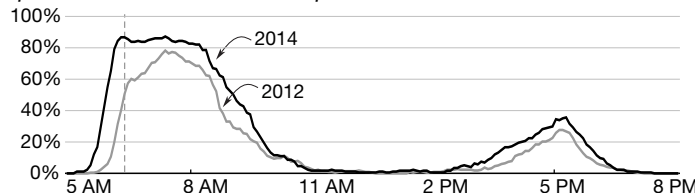
Data sources and analysis: WSDOT Multimodal Planning Division, Washington State Transportation Center, and WSDOT Office of Strategic Assessment and Performance Analysis.

Duration and frequency of congestion

The best visual evidence to show whether the peak period is spreading or contracting can be seen in "stamp graphs". These graphs, comparing 2012 and 2014 data, show the percentage of days annually with average speeds that were slower than a defined congestion threshold (45 mph for "congestion" and 36 mph for "severe congestion") on key highway segments statewide (see [pp. 9-11](#), [31-32](#), [37](#) and [41-42](#)).

High occupancy vehicle (HOV) lane stamp graphs compare the frequency and duration of congestion for HOV lane users with the congestion experienced by single occupant vehicle (SOV) lane users on the same route during 2014 (see [pp. 24-26](#)).

Example: Severe congestion on the Federal Way to Seattle commute 2012 and 2014; Northbound; Percent of days the average speed was slower than 36 mph



How frequently (and when) was the average trip speed slower than 36 mph? At 6:30 a.m. in 2012, you had a 57% chance that traffic would be moving slower than 36 mph. In 2014, the situation worsened (black line above gray line), and your chance of being stuck in severely congested conditions (slower than 36 mph) was 86%.

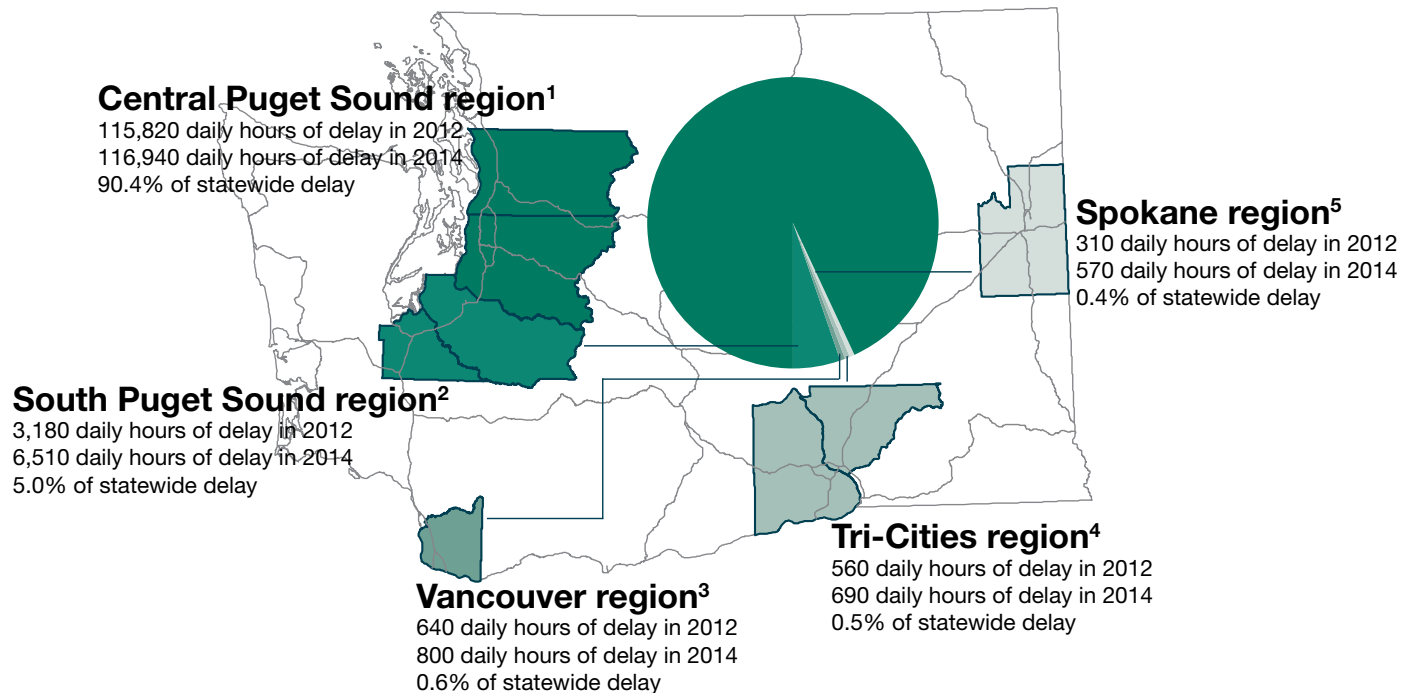
Data sources and analysis: WSDOT Northwest Region Traffic Office, Washington State Transportation Center, and WSDOT Office of Strategic Assessment and Performance Analysis.

See [WSDOT's Handbook for Corridor Capacity Evaluation](#) for additional details regarding methods for measuring and reporting highway system performance, along with a glossary of terms used for systems analysis.

WSDOT's 2015 *Corridor Capacity Report* is available at <http://wsdot.wa.gov/publications/fulltext/graynotebook/CCR15.pdf>. Additional congestion and capacity related analyses are available at www.wsdot.wa.gov/Accountability/Congestion/

Vehicle hours of delay

129,330 statewide daily hours of delay in 2014



Data source: WSDOT Multimodal Planning Division.

Notes: Data is for state highways only. The five urban regions account for 98.4% of statewide delay. The other 1.6% occurs on roads outside of these defined regions. 1 Central Puget Sound region includes King and Snohomish counties. 2 South Puget Sound region includes Pierce and Thurston counties. 3 Vancouver region includes Clark county. 4 Tri-Cities region includes Benton and Franklin counties. 5 Spokane region includes Spokane County.

Percent of the state highway system that is delayed or congested

2010 through 2014; By percent of total state highway system

	% of system delayed ¹			% of system congested ²		
	All	Urban	Rural	All	Urban	Rural
2010	11.6%	9.8%	1.8%	5.5%	4.9%	0.6%
2011	10.9%	9.3%	1.6%	5.4%	4.9%	0.5%
2012	10.6%	9.0%	1.6%	5.5%	4.9%	0.6%
2013	10.8%	9.2%	1.6%	5.5%	5.0%	0.5%
2014	11.7%	10.0%	1.7%	5.8%	5.2%	0.6%

Data source: WSDOT Multimodal Planning Division.

Notes: 1 The percent of the system delayed uses 85% of posted speed as the threshold (roughly 51 mph).

2 The percent of the system congested uses 70% of posted speed as the threshold (roughly 42 mph).

Average weekday vehicle miles traveled on major freeways

2005 through 2014; Vehicle miles traveled in thousands per day

Central Puget Sound	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2012 vs. 2014
I-5	7,524	7,687	7,744	7,583	7,676	7,835	8,020	7,919	8,019	8,027	1.4%
I-405	3,640	3,593	3,507	3,500	3,616	3,656	3,744	3,717	3,724	3,697	-0.5%
SR 520	1,008	1,053	1,019	932	901	933	941	732	750	739	1.0%
I-90	1,686	1,464	1,580	1,414	1,511	1,649	1,531	1,611	1,627	1,626	0.9%
SR 167	997	977	947	921	947	1,060	1,003	992	975	987	-0.5%
Subtotal	14,856	14,774	14,797	14,350	14,651	15,133	15,241	14,970	15,096	15,075	0.7%
South Puget Sound (I-5)	N/A	N/A	N/A	N/A	N/A	N/A	4,916	4,996	5,014	5,139	2.8%

Data source: WSDOT Multimodal Planning Division.

Notes: The reported VMT numbers are only a partial representation for reasons such as only single occupant vehicle (SOV) lanes being analyzed, data station malfunction, work zone traffic diversion, etc. To make accurate comparisons, the 2012 data was recalculated for this report.

Statewide Congestion Indicators

Vehicle hours of delay

Average weekday delay on major freeways

2005 through 2014; Vehicle hours of delay per day

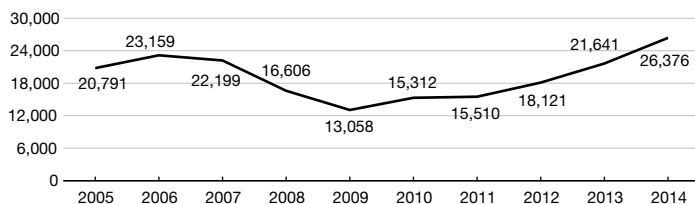
Central Puget Sound	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2012 vs. 2014
I-5	9,478	10,520	10,568	7,324	6,684	7,033	7,354	9,894	11,534	14,389	45%
I-405	7,753	8,334	7,654	6,864	4,478	5,605	5,719	6,439	7,976	9,427	46%
SR 520	1,808	2,224	2,180	1,518	1,334	1,496	1,335	363	486	633	74%
I-90	795	824	659	282	212	455	565	756	964	1,064	41%
SR 167	957	1,257	1,138	618	350	723	537	669	680	863	29%
Subtotal	20,791	23,159	22,199	16,606	13,058	15,312	15,510	18,121	21,641	26,376	46%
South Puget Sound (I-5)	N/A	N/A	N/A	N/A	N/A	N/A	2,118	1,814	2,860	3,601	99%

Data source: WSDOT Multimodal Planning Division.

Notes: The article on statewide delay ([2015 Corridor Capacity Report pp. 6-8](#)) examines all state highways, while this table examines specific major freeways. To make accurate comparisons, the 2012 data was recalculated for this report.

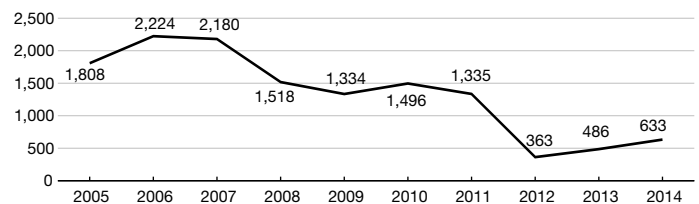
Central Puget Sound daily vehicle hours of delay

2005 through 2014; Combined delay for I-5, I-405, SR 520, I-90 and SR 167



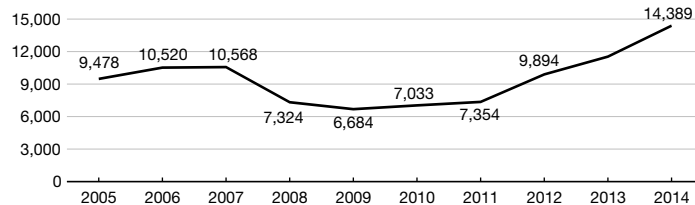
SR 520 daily vehicle hours of delay

2005 through 2014



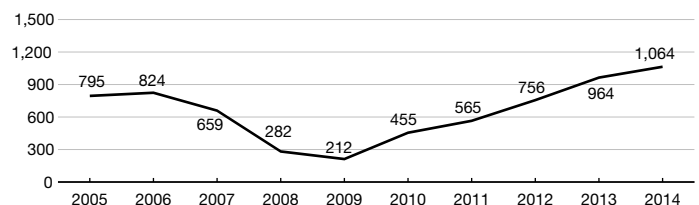
I-5 daily vehicle hours of delay

2005 through 2014



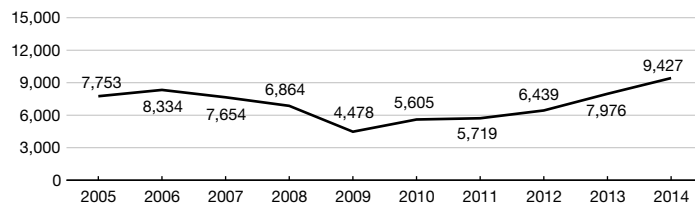
I-90 daily vehicle hours of delay

2005 through 2014



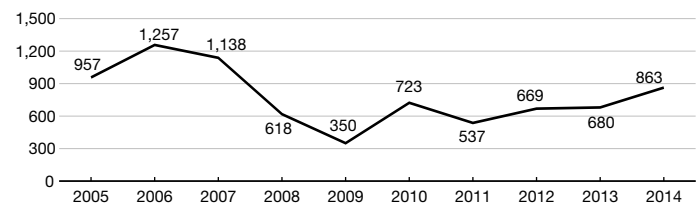
I-405 daily vehicle hours of delay

2005 through 2014



SR 167 daily vehicle hours of delay

2005 through 2014



Data source: WSDOT Multimodal Planning Division.

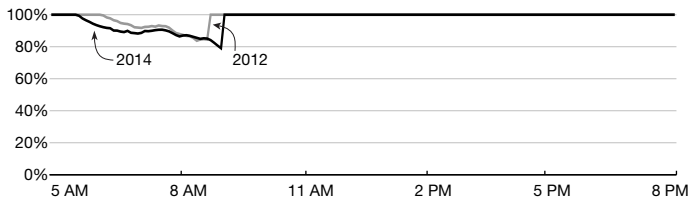
Note: See y-axis values for context of daily vehicle hours of delay across corridors.

Throughput productivity

Throughput productivity at select central Puget Sound region freeway locations by commute direction (part 1)
2012 and 2014; Based on the highest observed 5 min. flow rate (min.) flow rates; Vehicles per hour per lane (vphpl) at specific mileposts (MP)

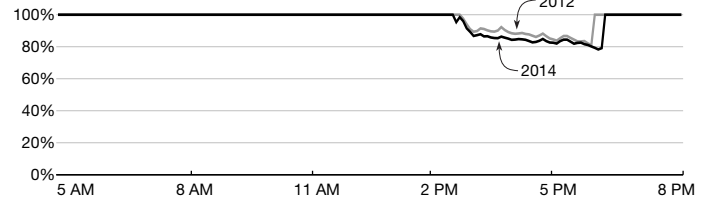
Northbound I-5 at S 188th Street (MP 153.0)

Based on the highest observed 5 min. flow rate of 1,930 vphpl = 100%



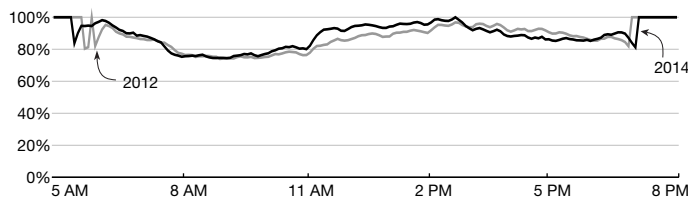
Southbound I-5 at S 188th Street (MP 153.0)

Based on the highest observed 5 min. flow rate of 1,490 vphpl = 100%



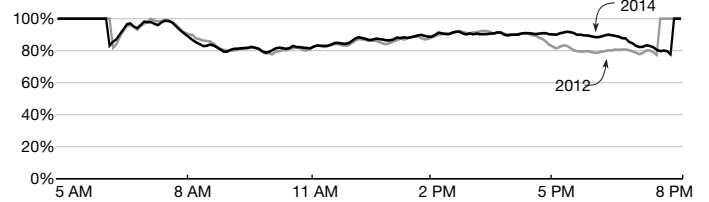
Northbound I-5 at I-90 (MP 164.0)

Based on the highest observed 5 min. flow rate of 1,500 vphpl = 100%



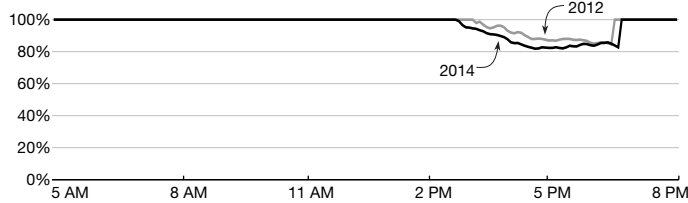
Southbound I-5 at I-90 (MP 164.0)

Based on the highest observed 5 min. flow rate of 1,740 vphpl = 100%



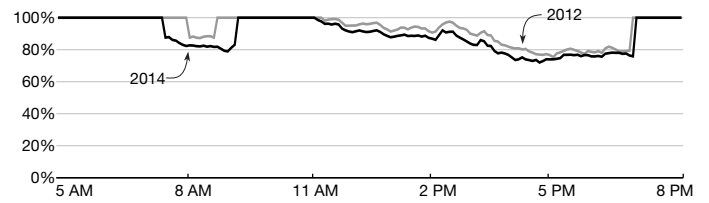
Northbound I-5 at NE 103rd Street (MP 172.0)

Based on the highest observed 5 min. flow rate of 1,480 vphpl = 100%



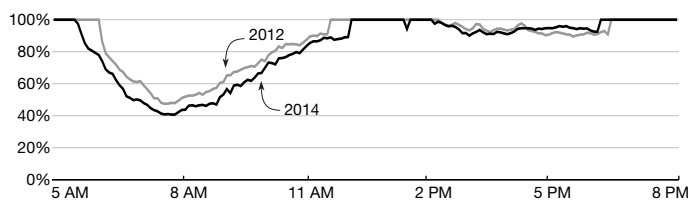
Southbound I-5 at NE 103rd Street (MP 172.0)

Based on the highest observed 5 min. flow rate of 1,620 vphpl = 100%



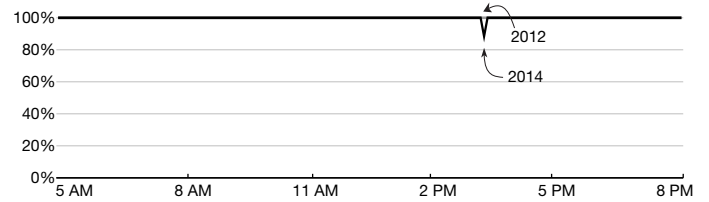
Northbound I-405 at SR 169 (MP 4.0)

Based on the highest observed 5 min. flow rate of 1,650 vphpl = 100%



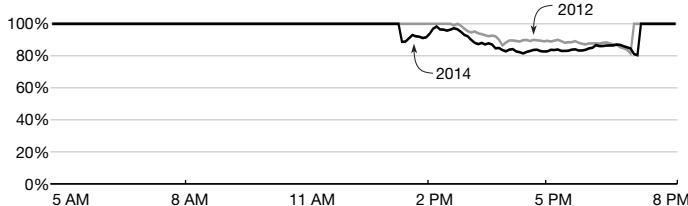
Southbound I-405 at SR 169 (MP 4.0)

Based on the highest observed 5 min. flow rate of 1,790 vphpl = 100%



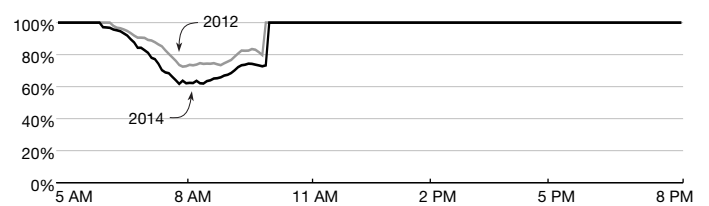
Northbound I-405 at NE 160th Street (MP 22.5)

Based on the highest observed 5 min. flow rate of 1,690 vphpl = 100%



Southbound I-405 at NE 160th Street (MP 22.5)

Based on the highest observed 5 min. flow rate of 1,640 vphpl = 100%



Data sources and analysis: WSDOT Multimodal Planning Division, Washington State Transportation Center, and WSDOT Office of Strategic Assessment and Performance Analysis.

Note: See p. 2 for throughput definitions and how to read these graphs.

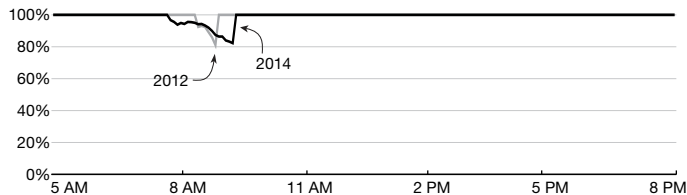
Central Puget Sound Region

Throughput productivity

Throughput productivity at select central Puget Sound region freeway locations by commute direction (part 2)
 2012 and 2014; Based on the highest observed 5-minute (min.) flow rates; Vehicles per hour per lane (vphpl) at specific mileposts (MP)

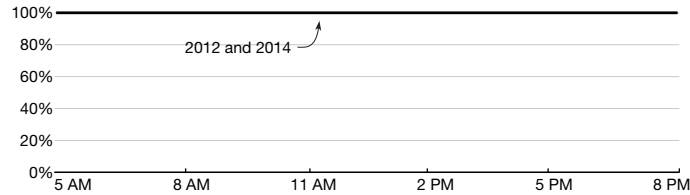
Eastbound SR 520 at Evergreen Point Floating Bridge (MP 1.5)

Based on the highest observed 5 min. flow rate of 1,600 vphpl = 100%



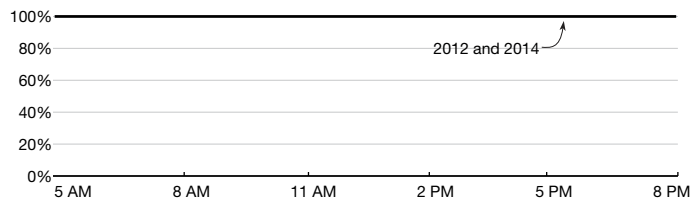
Westbound SR 520 at Evergreen Point Floating Bridge (MP 1.5)

Based on the highest observed 5 min. flow rate of 1,610 vphpl = 100%



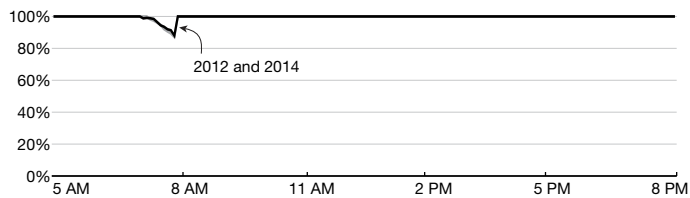
Eastbound I-90 at SR 900 (MP 16.5)

Based on the highest observed 5 min. flow rate of 1,740 vphpl = 100%



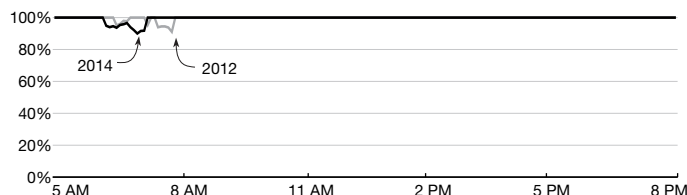
Westbound I-90 at SR 900 (MP 16.5)

Based on the highest observed 5 min. flow rate of 1,580 vphpl = 100%



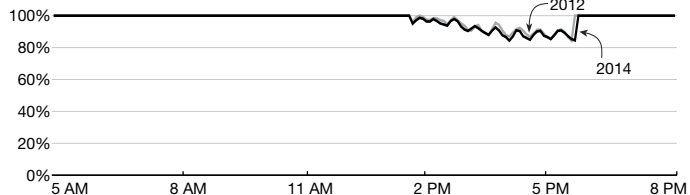
Northbound SR 167 at 84th Avenue SE (MP 21.5)

Based on the highest observed 5 min. flow rate of 1,520 vphpl = 100%



Southbound SR 167 at 84th Avenue SE (MP 21.5)

Based on the highest observed 5 min. flow rate of 1,570 vphpl = 100%



Data sources and analysis: WSDOT Multimodal Planning Division, Washington State Transportation Center, and WSDOT Office of Strategic Assessment and Performance Analysis.

Note: See p. 2 for throughput definitions and how to read these graphs.

Routinely congested segments in 2012

Central Puget Sound region routinely congested freeway segments

2012 weekdays; Length of congestion in miles; Duration of congestion in hours:minutes

Route and direction	Morning peak period				Evening peak period			
	Start and end times	Begin and end milepost	Length of congestion	Duration of congestion	Start and end times	Begin and end milepost	Length of congestion	Duration of congestion
I-5 northbound	5:40-8:15 a.m.	145-153.5	8.5	2:35	2:10-6:30 p.m.	161-165.5	4.5	4:20
	6:15-10:00 a.m.	159-165.5	6.5	3:45	3:10-6:30 p.m.	166-179	13	3:20
					3:15-5:50 p.m.	184.5-185	0.5	2:35
					2:50-5:45 p.m.	191-192.5	1.5	2:55
I-5 southbound	6:10-8:55 a.m.	182.5-173.5	9	2:45	2:00-7:10 p.m.	172.5-165	7.5	5:10
	7:20-9:10 a.m.	171-168	3	1:50	2:00-6:55 p.m.	164.5-163	1.5	4:55
	7:25-8:25 a.m.	167-166	1	1:00	4:10-4:55 p.m. ¹	155.5-155	0.5	0:45
	7:10-8:15 a.m.	164.5-163	1.5	1:05	2:45-5:50 p.m.	154.5-151	3.5	3:05
I-405 northbound	6:05-10:00 a.m.	3-8.5	5.5	3:55	2:30-6:20 p.m.	0.5-5	4.5	3:50
	8:35-8:55 a.m. ¹	11.5-12	0.5	0:20	3:05-6:45 p.m.	14-23.5	9.5	3:40
					3:40-6:10 p.m.	25.5-28	2.5	2:30
I-405 southbound	6:15-10:00 a.m.	29-16	13	3:45	4:15-5:50 p.m.	28.5-23.5	5	1:35
	7:35-7:45 a.m. ¹	10-9	1	0:10	2:00-7:15 p.m.	14.5-6.5	8	5:15
	7:10-8:25 a.m.	8-6	2	1:15	2:45-5:30 p.m.	0.5-0	0.5	2:45
I-90 eastbound	7:30-9:00 a.m.	3.5-4	0.5	1:30	4:50-4:55 p.m. ¹	3.5-4	0.5	0:05
					4:45-5:45 p.m.	7-7.5	0.5	1:00
I-90 westbound	7:20-7:50 a.m. ¹	16-15.5	0.5	0:30	5:15-5:30 p.m. ¹	11-10.5	0.5	0:15
	7:20-8:30 a.m.	14-12.5	1.5	1:10	3:35-6:55 p.m.	8.5-4.5	4	3:20
	7:30-7:55 a.m. ¹	9-8	1	0:25				
	7:30-9:00 a.m.	6.5-2.5	4	1:30				
SR 520 eastbound	8:30-8:55 a.m. ¹	5.5-6	0.5	0:25	5:25-6:25 p.m.	11.5-13	1.5	1:00
SR 520 westbound	7:40-7:55 a.m. ¹	7.5-7	0.5	0:15	4:05-6:50 p.m.	7.5-1.5	6	2:45
	7:25-9:20 a.m.	4-1.5	2.5	1:55				
SR 167 northbound	6:10-8:25 a.m.	14.5-19.5	5	2:15				
	6:20-9:00 a.m.	24.5-26	1.5	2:40				
SR 167 southbound					2:15-4:20 p.m.	24-23.5	0.5	2:05
					2:15-6:20 p.m.	19.5-13	6.5	4:05

Data sources and analysis: Washington State Transportation Center and WSDOT Office of Strategic Assessment and Performance Analysis.

Notes: 1 Not reported on routinely congested segments map or narrative in main report due to duration of less than 50 minutes.

Central Puget Sound Region

Routinely congested segments in 2014

Central Puget Sound region routinely congested freeway segments

2014 weekdays; Length of congestion in miles; Duration of congestion in hours:minutes

Route and direction	Morning peak period				Evening peak period			
	Start and end times	Begin and end milepost	Length of congestion	Duration of congestion	Start and end times	Begin and end milepost	Length of congestion	Duration of congestion
I-5 northbound	5:25-8:10 a.m.	144.5-153.5	9	2:45	2:00-6:35 p.m.	161.5-165.5	4	4:35
	6:05-10:00 a.m.	158.5-165.5	7	3:55	3:05-6:40 p.m.	166-179	13	3:35
					4:10-5:40 p.m.	182.5-183	0.5	1:30
					2:40-6:05 p.m.	184.5-185	0.5	3:25
					3:20-3:25 p.m. ¹	190-190.5	0.5	0:05
I-5 southbound	6:20-6:25 a.m. ¹	185.5-185	0.5	0:05	2:00-7:05 p.m.	172.5-165	7.5	5:05
	6:10-6:40 a.m. ¹	184-183.5	0.5	0:30	2:00-6:45 p.m.	164.5-163	1.5	4:45
	6:05-9:10 a.m.	182.5-173.5	9	3:05	2:40-5:55 p.m.	156.5-151	5.5	3:15
	7:10-9:45 a.m.	172-168	4	2:35				
I-405 northbound	5:35-10:00 a.m.	2.5-8.5	6	4:25	2:20-6:00 p.m.	0.5-5.5	5	3:40
	8:45-9:00 a.m. ¹	11.5-12	0.5	0:15	2:40-6:55 p.m.	14.5-23.5	9	4:15
					2:40-6:30 p.m.	25.5-28	2.5	3:50
I-405 southbound	6:00-10:00 a.m.	29-16.5	12.5	4:00	2:00-7:25 p.m.	14.5-6.5 ²	8	5:25
	7:15-8:25 a.m.	8-6	2	1:10	2:45-5:35 p.m.	1-0	1	2:50
I-90 eastbound	7:20-9:10 a.m.	3.5-4.5	1	1:50				
I-90 westbound	7:15-7:55 a.m. ¹	16-15	1	0:40	4:45-5:45 p.m.	11-10	1	1:00
	7:15-8:30 a.m.	14.5-12.5	2	1:15	3:35-7:00 p.m.	8.5-5.5	3	3:25
	7:45-8:55 a.m.	11-10.5	0.5	1:10				
	7:15-8:10 a.m.	9-8	1	0:55				
	7:30-9:05 a.m.	6.5-3	3.5	1:35				
SR 520 eastbound	7:45-9:10 a.m.	1-3	2	1:25	5:35-5:50 p.m. ¹	11-11.5	0.5	0:15
SR 520 westbound	7:45-9:10 a.m.	7.5-7	0.5	1:25	4:10-6:45 p.m.	7.5-1.5	6	2:35
	7:35-8:45 a.m.	6-1.5	4.5	1:10				
SR 167 northbound	5:30-8:05 a.m.	16-19.5	3.5	2:35				
	6:20-8:45 a.m.	24.5-26	1.5	2:25				
SR 167 southbound					2:15-4:55 p.m.	24-23.5	0.5	2:40
					2:10-6:00 p.m.	19.5-15.5	4	3:50

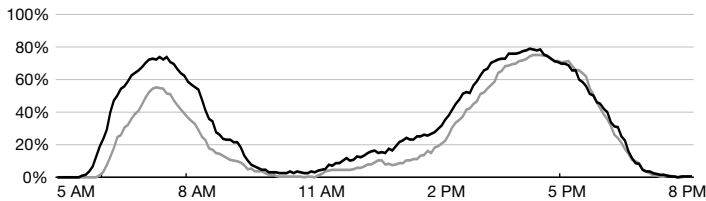
Data sources and analysis: Washington State Transportation Center and WSDOT Office of Strategic Assessment and Performance Analysis.

Notes: 1 Not reported on routinely congested segments map or narrative in main report due to duration of less than 50 minutes. 2 Segment is made of multiple smaller segments that are spaced close together (within 0.5 mile), in the same direction and start and end at similar times.

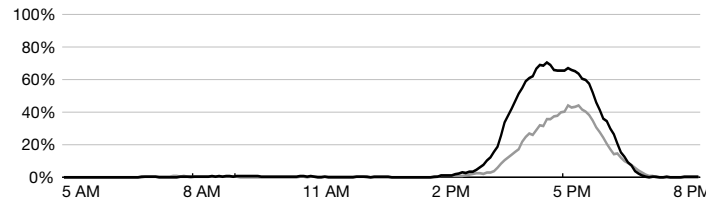
Stamp graphs: Frequency, duration of SEVERE congestion

Stamp graphs of SEVERE congestion by time of day on central Puget Sound region freeways (part 1)
2012 and 2014 weekdays; Percent of days average speed was slower than 36 mph

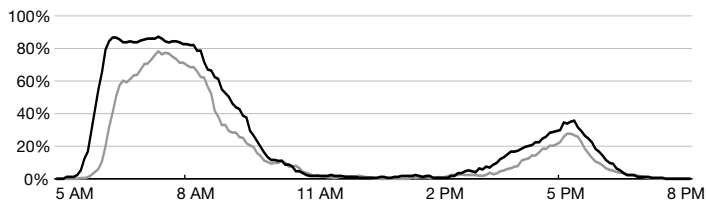
Everett to Seattle via I-5



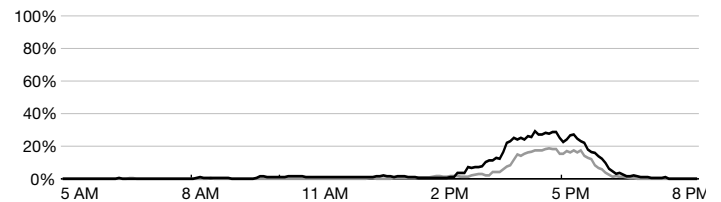
Seattle to Everett via I-5



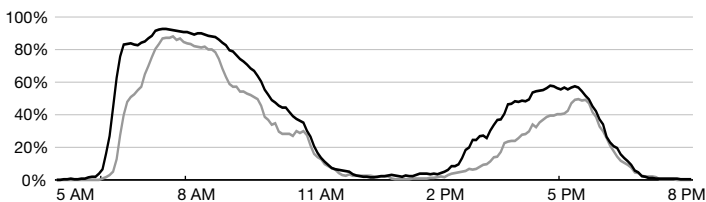
Federal Way to Seattle via I-5



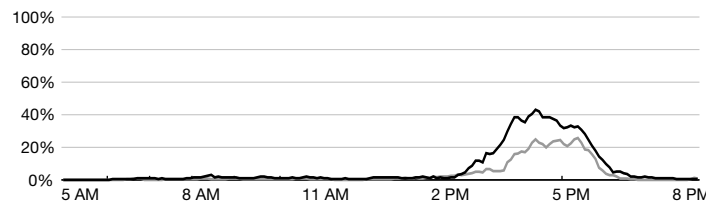
Seattle to Federal Way via I-5



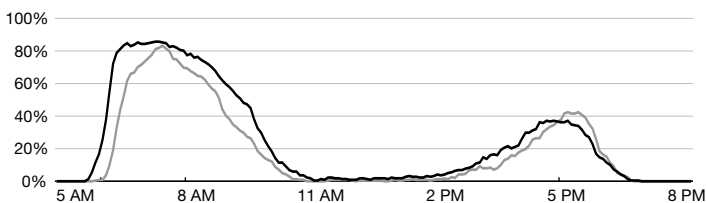
SeaTac to Seattle via I-5



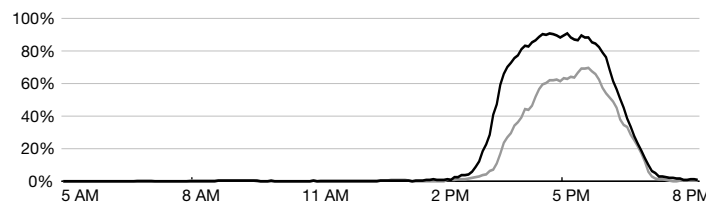
Seattle to SeaTac via I-5



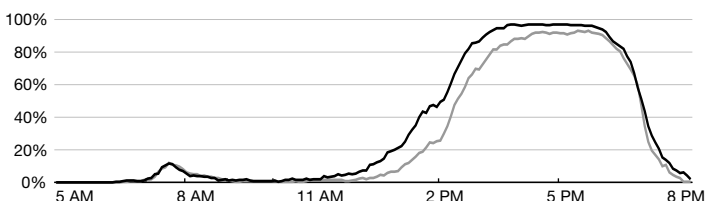
Lynnwood to Bellevue via I-405



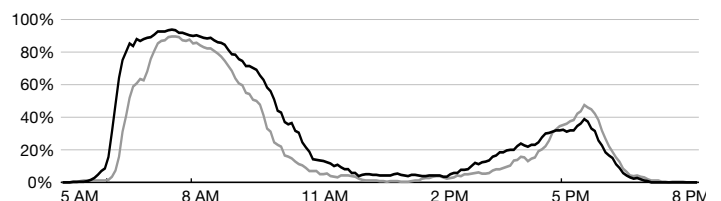
Bellevue to Lynnwood via I-405



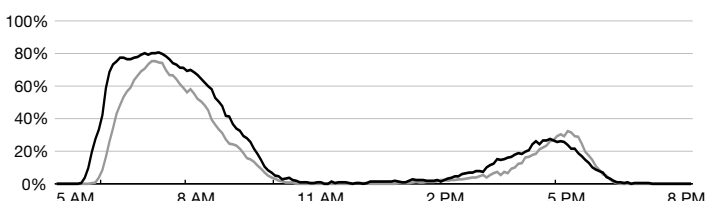
Bellevue to Tukwila via I-405



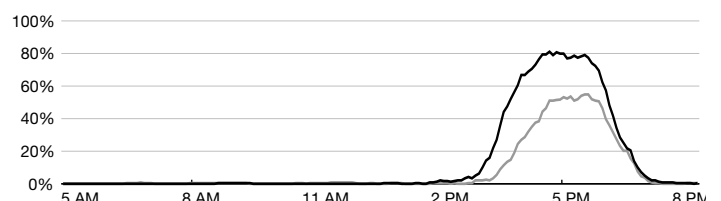
Tukwila to Bellevue via I-405



Everett to Bellevue via I-5/I-405



Bellevue to Everett via I-405/I-5



Data sources and analysis: WSDOT Northwest Region Traffic Office, Washington State Transportation Center, and WSDOT Office of Strategic Assessment and Performance Analysis.

Note: See p. 2 for congestion definitions and how to read these graphs.

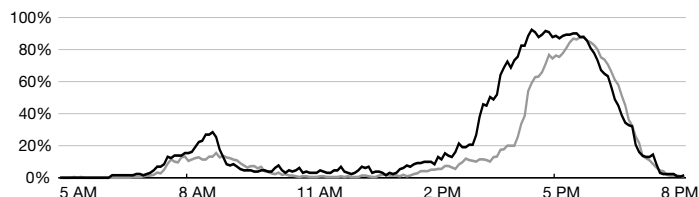
— 2012 — 2014

Central Puget Sound Region

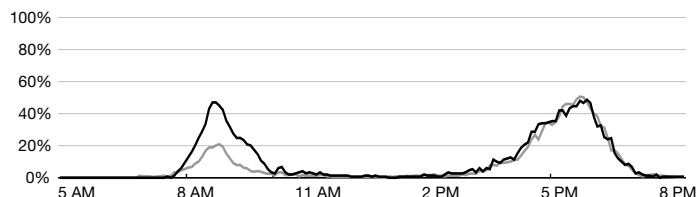
Stamp graphs: Frequency, duration of SEVERE congestion

Stamp graphs of SEVERE congestion by time of day on central Puget Sound region freeways (part 2)
2012 and 2014 weekdays; Percent of days average speed was slower than 36 mph

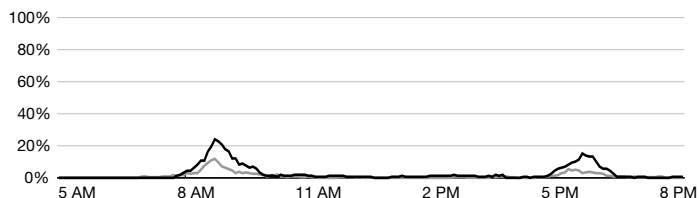
Bellevue to Seattle via I-405/SR 520/I-5



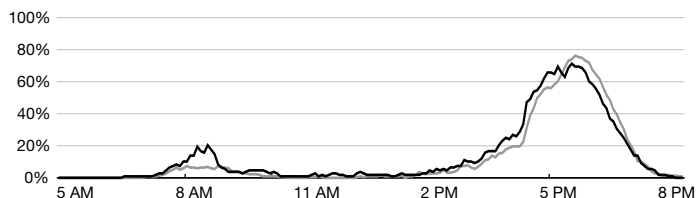
Seattle to Bellevue via I-5/SR 520/I-405



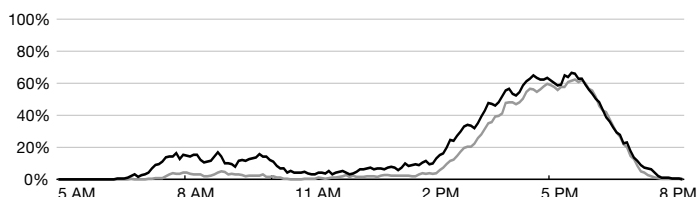
Seattle to Redmond via I-5/SR 520



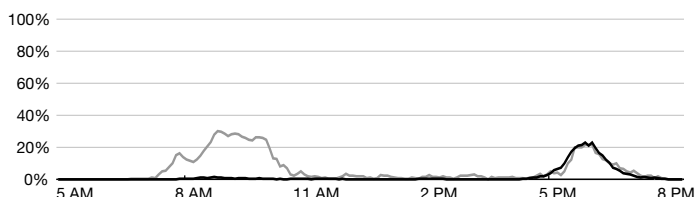
Redmond to Seattle via SR 520/I-5



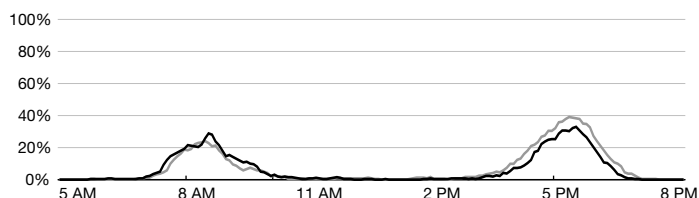
Redmond to Bellevue via SR 520/I-405



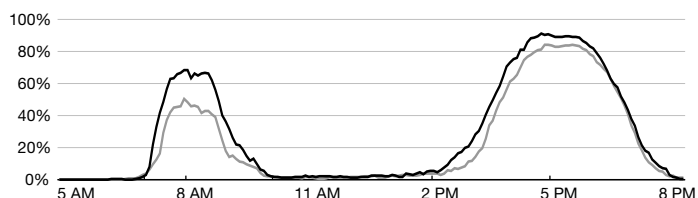
Bellevue to Redmond via I-405/SR 520



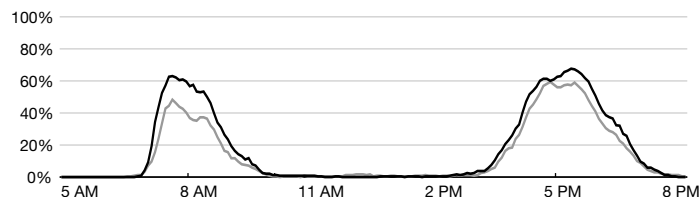
Seattle to Bellevue via I-5/I-90/I-405



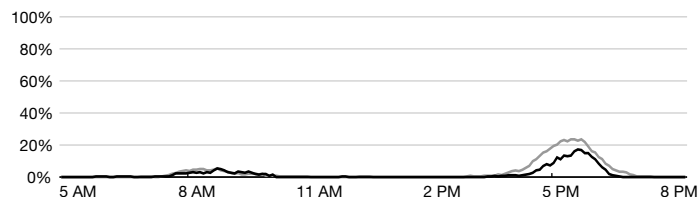
Bellevue to Seattle via I-405/I-90/I-5



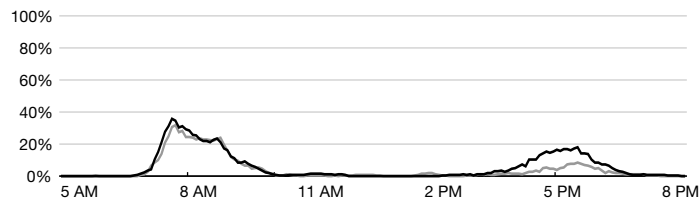
Issaquah to Seattle via I-90/I-5



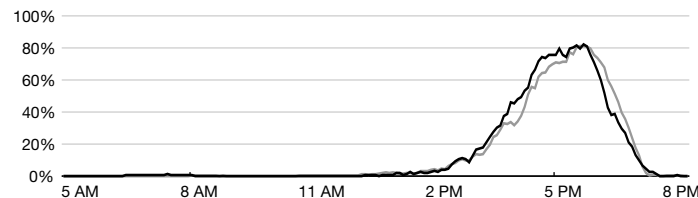
Seattle to Issaquah via I-5/I-90



Issaquah to Bellevue via I-90/I-405



Bellevue to Issaquah via I-405/I-90



Data sources and analysis: WSDOT Northwest Region Traffic Office, Washington State Transportation Center, and WSDOT Office of Strategic Assessment and Performance Analysis.

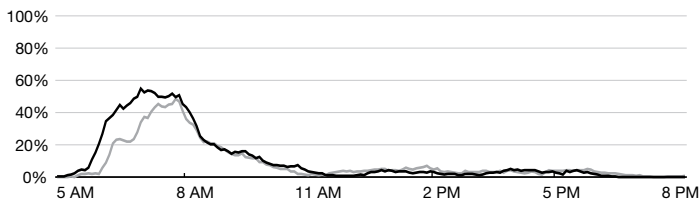
Note: See p. 2 for congestion definitions and how to read these graphs.

— 2012 — 2014

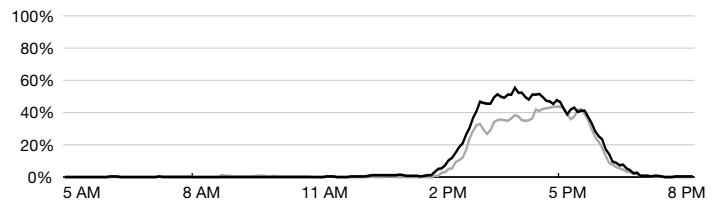
Stamp graphs and how to read a spiral graph

Stamp graphs of SEVERE congestion by time of day on central Puget Sound region freeways (part 3)
2012 and 2014 weekdays; Percent of days average speed was slower than 36 mph

Auburn to Renton via SR 167



Renton to Auburn via SR 167



Data sources and analysis: WSDOT Northwest Region Traffic Office, Washington State Transportation Center, and WSDOT Office of Strategic Assessment and Performance Analysis.

Note: See p. 2 for congestion definitions and how to read these graphs.

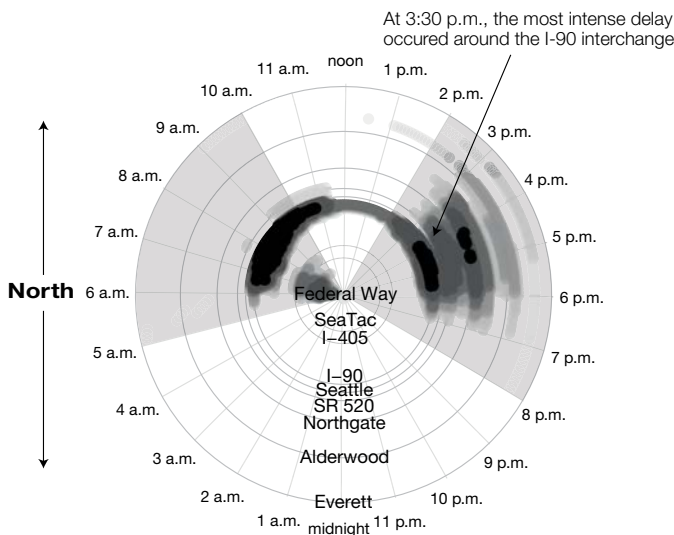
— 2012 — 2014

How to read a spiral graph

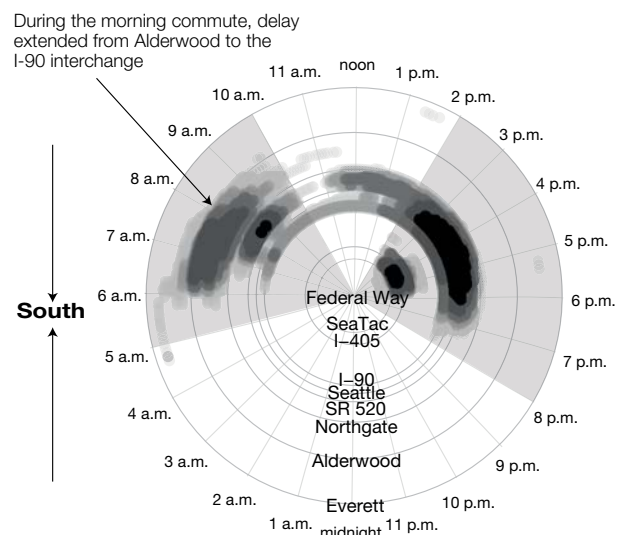
When and where was the most intense delay as measured by daily vehicle hours of delay? How does delay differ by direction of travel? What corridors experienced the most noticeable delay?

Spiral graphs provide a graphic visualization of temporal and spatial data that is well suited to time-based traffic metrics. The graph can be read like a standard clock with variables specific to the chosen metric. In the following example, WSDOT modeled vehicle hours of delay by using time of day (measured in 5-minute intervals), location on the chosen corridor and intensity of delay. Darker shading represented more intense delay on the commute corridor. The shading factor was standardized for the aggregate data to allow cross-corridor comparisons. In addition, the spiral graphs were separated by direction on the corridor, supporting more detailed comparisons. Each direction is read in a different manner, as indicated by the arrows. The northbound graph to the left is read from the center to the edge. The corresponding southbound graph is read from the edge to the center. For the purposes of this report, the eastbound direction is read like northbound; the westbound direction like southbound.

I-5 between Federal Way and Everett



Between 6-11 a.m., there was intense delay around the Seattle area. Evening delay peaking between 3-6 p.m., and was widespread along the entire northbound I-5 corridor.



Delay on I-5 southbound was more widespread during the morning but more pronounced during the evening commute. The most intense delay occurred from Northgate to Seattle during the evening, and lasted for about four hours.

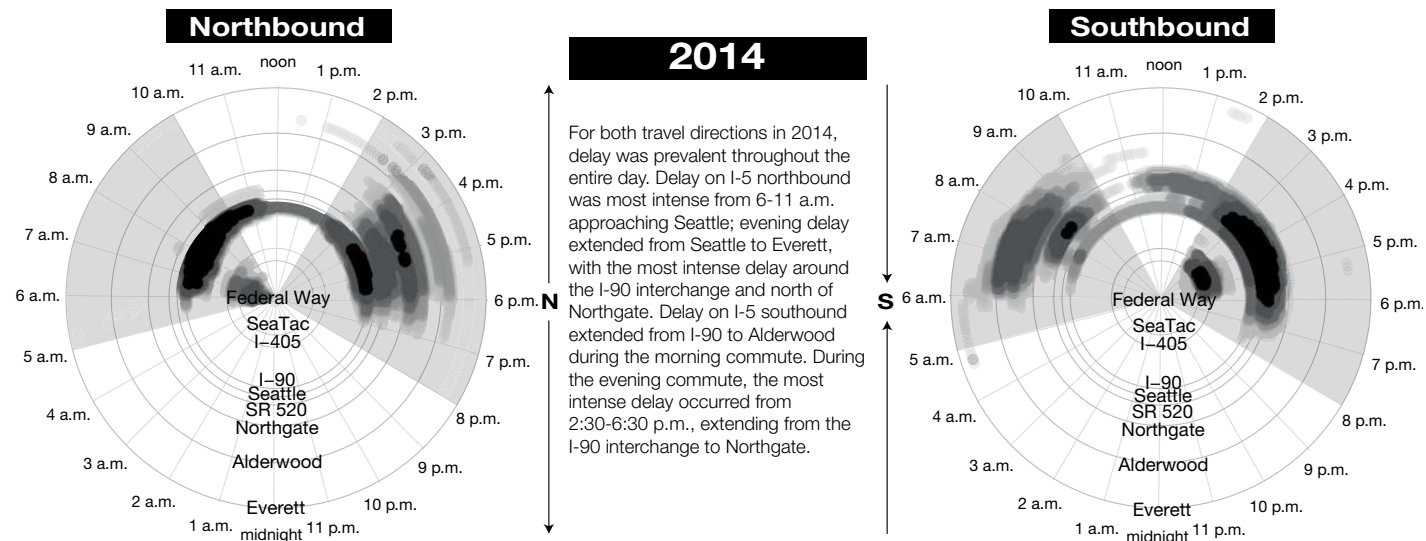
Data sources and analysis: Washington State Transportation Center and WSDOT Office of Strategic Assessment and Performance Analysis.

Central Puget Sound Region

Spiral graphs: Daily vehicle hours of delay on I-5

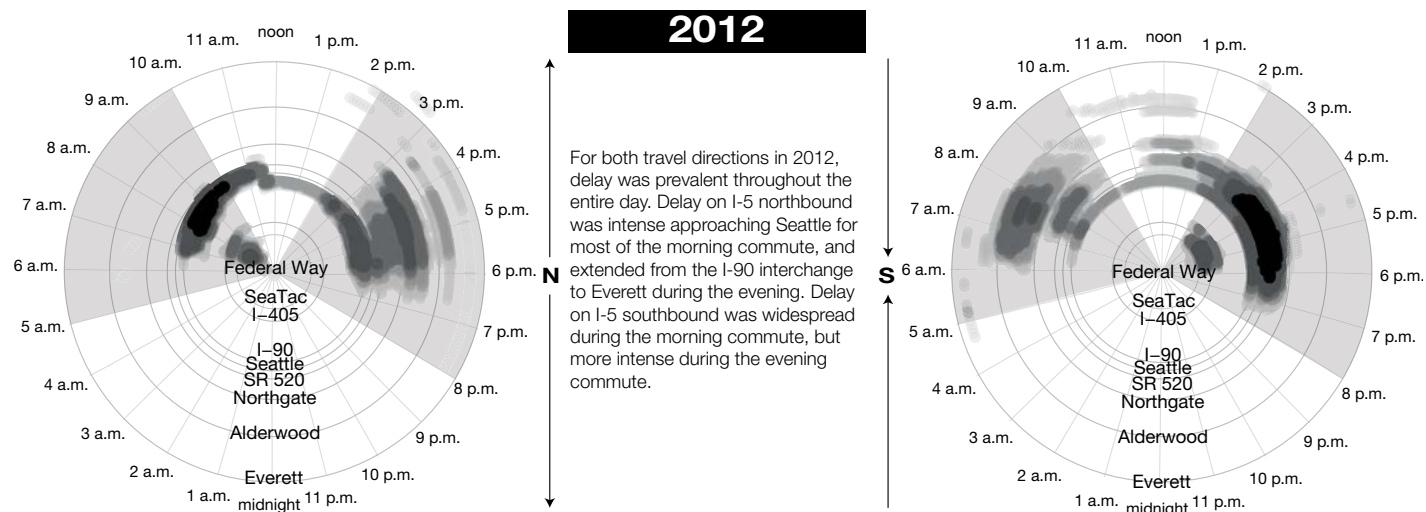
2014 showing longer periods of intense delay on central Puget Sound region's I-5 corridor

2012 and 2014; Weekdays only; Vehicle hours of delay; Shading represents intensity of delay



From 2012 to 2014, the intensity of delay increased on I-5 northbound from Federal Way to Everett. During the morning commute, delay approaching Seattle lasted for longer and was more intense in 2014, with the most intense delay extended beyond the morning peak period. Evening delay followed similar patterns, with pockets of the most intense delay around the I-90 and SR 520 interchanges in 2014.

From 2012 to 2014, the intensity of delay increased on I-5 southbound from Northgate to SR 520 during the morning commute and from the I-405 interchange to SeaTac during the evening commute. While delay between 10 a.m. and 2 p.m. was not as extensive in 2014, there was more intense delay between Northgate and SR 520 during the off-peak period.



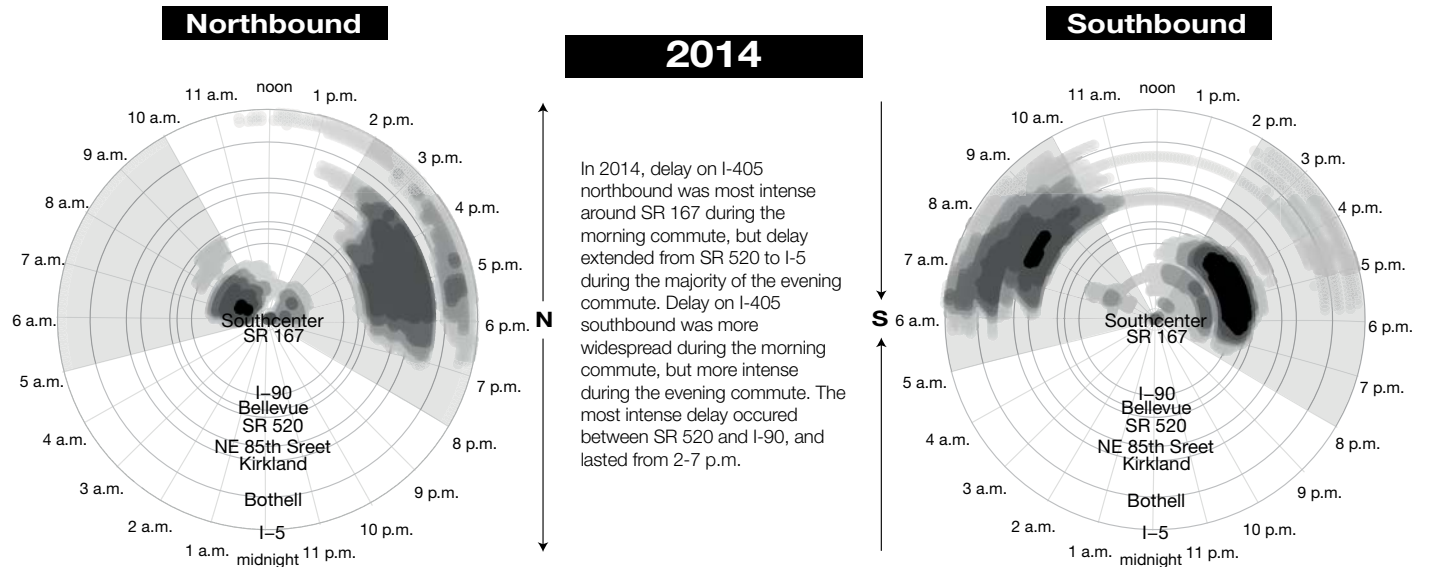
Data sources and analysis: Washington State Transportation Center and WSDOT Office of Strategic Assessment and Performance Analysis.

Note: Spiral graphs are read by commute direction as indicated by the arrows. Northbound is read from the center of the circle to the outer edge; southbound from the outer edge of the circle to the center.

Spiral graphs: Daily vehicle hours of delay on I-405

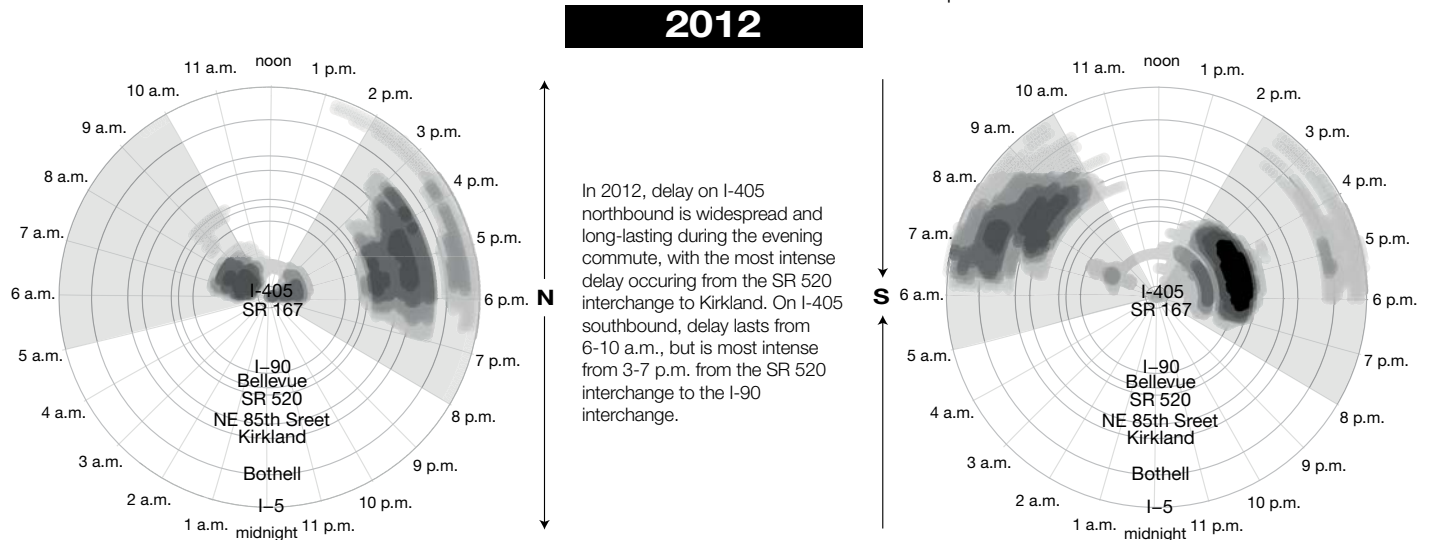
2014 showing more off-peak period delay on central Puget Sound region's I-405 corridor

2012 and 2014; Weekdays only; Vehicle hours of delay; Shading represents intensity of delay



From 2012 to 2014, the intensity of delay increased during the morning commute north of SR 167. During the evening commute, both 2012 and 2014 delay occurred between Bellevue and the I-5 interchange. However, 2014 evening delay was more intense. Delay around the I-5 interchange extended during the off-peak period from 11:30 a.m. to 2 p.m., lasting 1.5 hours more in 2014 than in 2012.

From 2012 to 2014, morning delay on I-405 southbound intensified with longer periods of more intense delay, with the largest increase in delay occurring around Kirkland. During the evening commute, southbound delay occurred in the same locations in both 2012 and 2014. However, 2014 delay lasted all day around Kirkland and Bothell, extending past the traditional peak periods of 5-10 a.m. and 2-8 p.m.



Data sources and analysis: Washington State Transportation Center and WSDOT Office of Strategic Assessment and Performance Analysis.

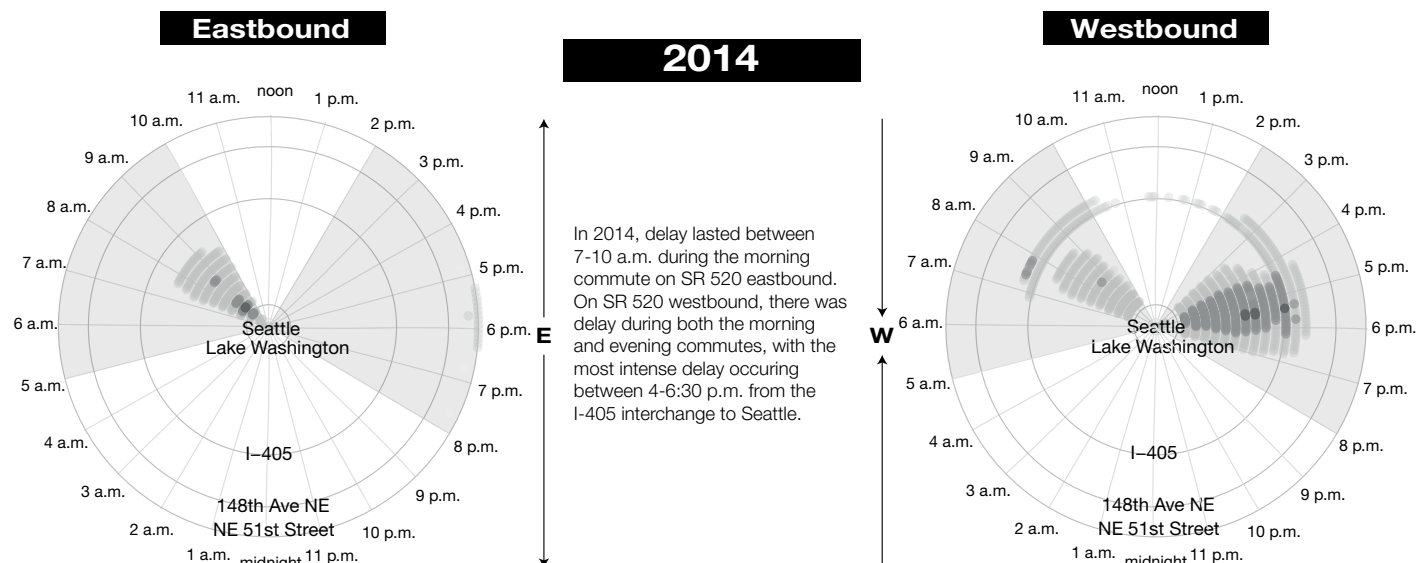
Note: Spiral graphs are read by commute direction as indicated by the arrows. Northbound is read from the center of the circle to the outer edge; southbound from the outer edge of the circle to the center.

Central Puget Sound Region

Spiral graphs: Daily vehicle hours of delay on SR 520

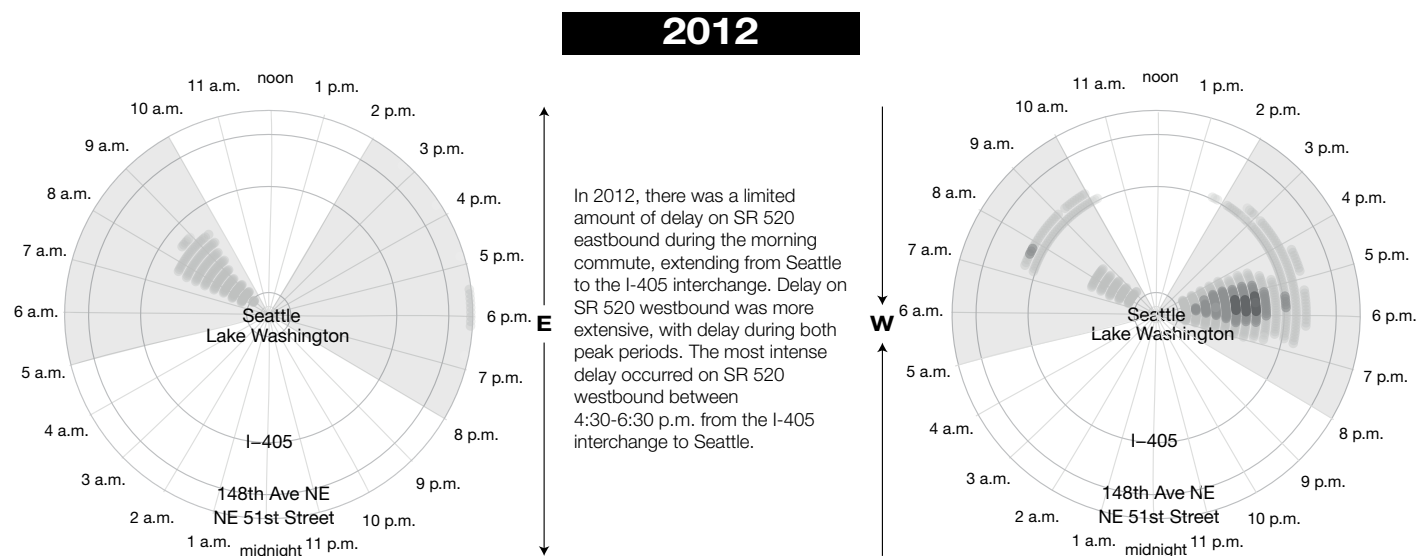
2014 showing longer lasting evening delay on central Puget Sound region's SR 520 corridor

2012 and 2014; Weekdays only; Vehicle hours of delay; Shading represents intensity of delay



2012 and 2014 showed similar patterns of delay on SR 520 eastbound. However, 2014 saw pockets of more intense delay during the morning commute between Seattle and the I-405 interchange.

Delay on SR 520 westbound extended along more of the corridor for the morning commute in 2014. During the evening commute, delay between Seattle and I-405 interchange lasted between 3-7 p.m., an hour longer than in 2012. Delay around the I-405 interchange also lasted for most of the day in 2014.



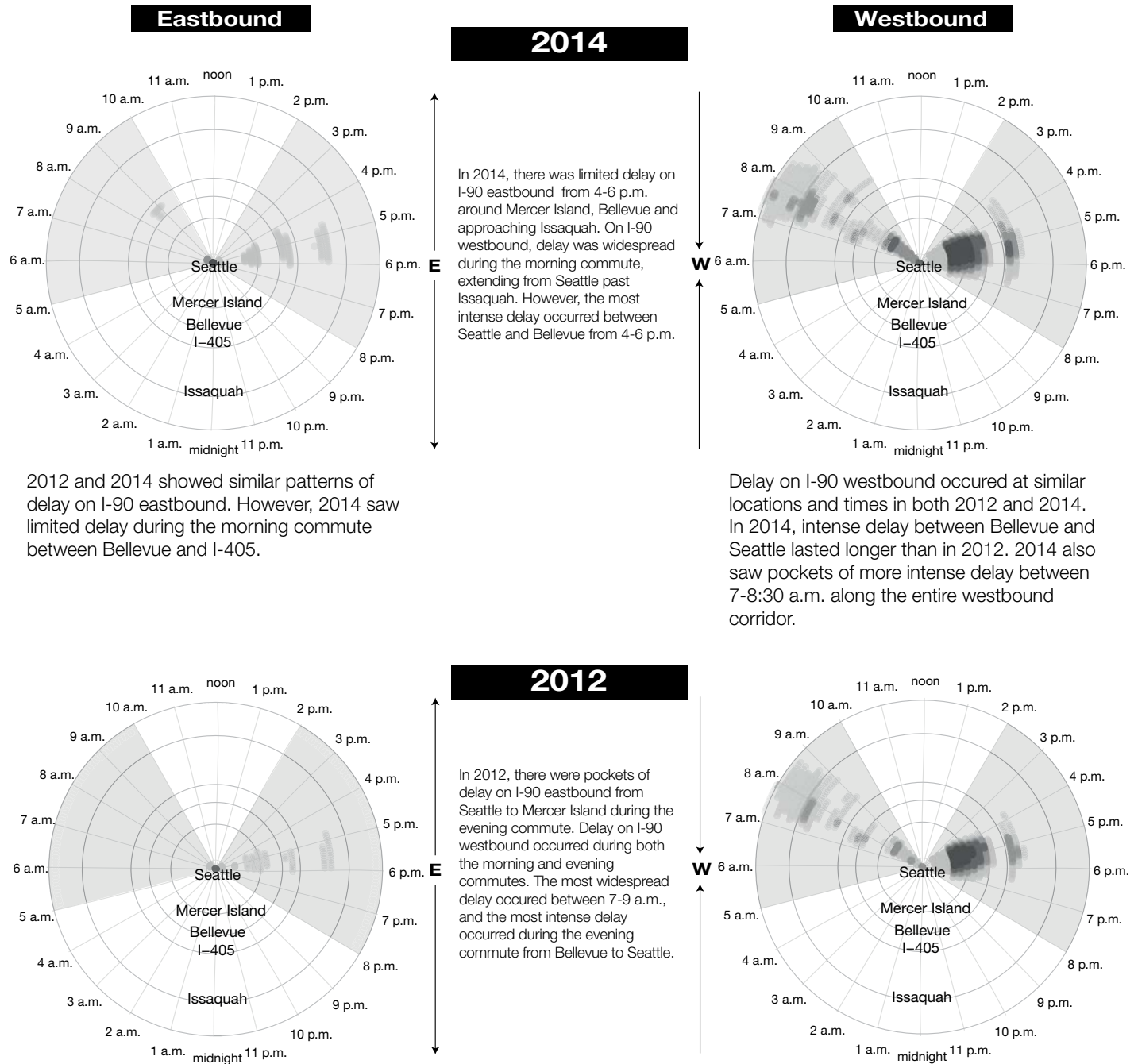
Data sources and analysis: Washington State Transportation Center and WSDOT Office of Strategic Assessment and Performance Analysis.

Note: Spiral graphs are read by commute direction as indicated by the arrows. Eastbound is read from the center of the circle to the outer edge; westbound from the outer edge of the circle to the center.

Spiral graphs: Daily vehicle hours of delay on I-90

2014 showing pockets of more intense delay on central Puget Sound region's I-90 corridor

2012 and 2014; Weekdays only; Vehicle hours of delay; Shading represents intensity of delay



Data sources and analysis: Washington State Transportation Center and WSDOT Office of Strategic Assessment and Performance Analysis.

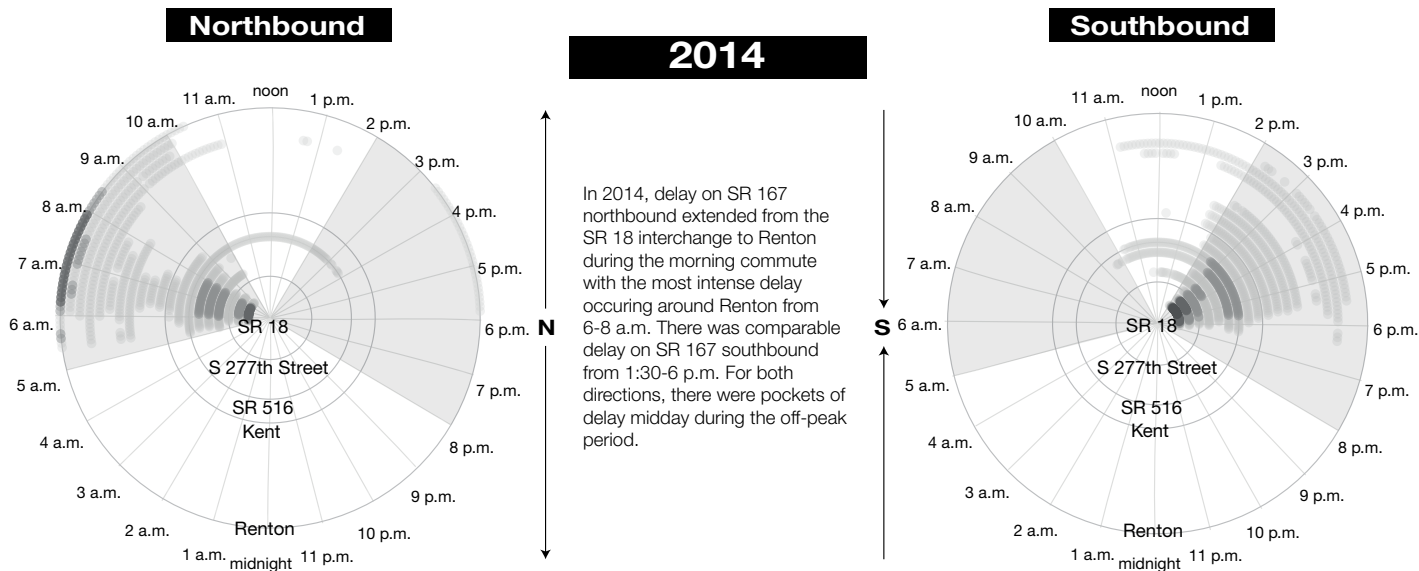
Note: Spiral graphs are read by commute direction as indicated by the arrows. Eastbound is read from the center of the circle to the outer edge; westbound from the outer edge of the circle to the center.

Central Puget Sound Region

Spiral graphs: Daily vehicle hours of delay on SR 167

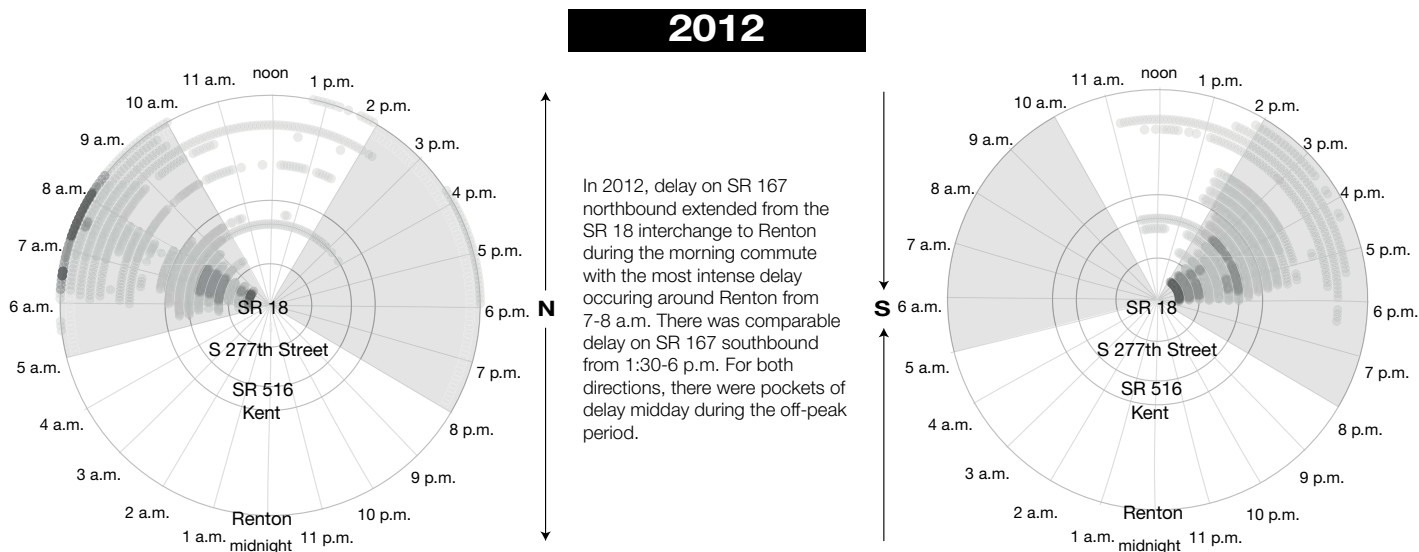
2014 showing longer lasting intense delay on central Puget Sound region's SR 167 corridor

2012 and 2014; Weekdays only; Vehicle hours of delay; Shading represents intensity of delay



While 2012 showed small amounts of delay on SR 167 northbound during the off-peak hours, during the morning commute 2014 delay extended along the entire corridor from the SR 18 interchange to Renton. Renton also had a longer period of intense delay, lasting from 6-8 a.m., one hour longer than in 2012.

Delay on SR 167 southbound showed roughly the same patterns in 2012 and 2014, with delay during the mid-day off-peak period and from 2-6 p.m. on most of the corridor. However, in 2014 there was more intense, longer lasting delay south of SR 516, as well as between South 277th Street and the SR 18 interchange.



Data sources and analysis: Washington State Transportation Center and WSDOT Office of Strategic Assessment and Performance Analysis.

Note: Spiral graphs are read by commute direction as indicated by the arrows. Northbound is read from the center of the circle to the outer edge; southbound from the outer edge of the circle to the center.

Commute trip analysis

Morning commutes: Changes in travel time performance, congestion, reliability, emissions and transit performance for 19 morning high-demand commute trips in the central Puget Sound region
2012 and 2014; Morning peak (5-10 a.m.) for an annualized average weekday; 5-minute peak of commuter rush (individual peak times vary); Length of route in miles; All travel times in minutes; Peak of commuter rush and duration of congestion expressed in hours and minutes; Cost of congestion in dollars; Emissions in pounds of carbon dioxide equivalents (CO₂e); Average transit ridership, average load, and emissions avoided based on the average maximum load during the peak period

Morning				Travel Times										Congestion										Reliability										Emissions									
Route	Direction of travel	Length of route	Peak commute time	Travel time at posted speed	Travel time at maximum throughput speed	Average travel time at peak of morning commute			Maximum throughput travel time index (MT ³ I)		Peak period %Δ in VMT	Duration of congestion: How long average speed is below 45 mph			Cost of congestion ¹ per person ² , per trip			2012 percentiles				2014 percentiles				Δ: 2012 vs. 2014				Greenhouse gas emissions ³ in pounds of CO ₂ e													
						2012	2014	%Δ	2012	2014		2012	2014	%Δ	2012	2014	%Δ	Median				Median				Median				Emitted during peak period			Emitted per person ²										
																		50th	80th	90th	95th	50th	80th	90th	95th	50th	80th	90th	95th	2012	2014	%Δ	2012	2014	%Δ								
To Seattle																																											
I-5 Everett to Seattle ⁹	SB	24	7:25	24	28	44	51	16%	1.56	1.81	2%	2:30	3:20	0:50	\$3.33	\$4.65	40%	41	57	63	76	49	64	72	85	8	7	9	9	546,845	578,119	6%	20.7	21.4	3%								
I-5 Federal Way to Seattle ⁹	NB	22	7:15	22	27	46	52	13%	1.72	1.96	0%	3:55	4:40	0:45	\$3.80	\$5.11	34%	46	54	59	66	52	63	67	76	5	9	8	10	640,192	636,175	-1%	21.6	21.5	0%								
I-90/I-5 Issaquah to Seattle	WB/NB	15	7:40	15	19	26	29	12%	1.41	1.54	2%	1:50	2:15	0:25	\$1.82	\$2.21	21%	25	31	36	40	28	34	39	42	3	3	4	2	286,885	286,422	0%	13.5	13.2	-2%								
SR 520/I-5 Redmond to Seattle	WB/SB	13	8:35	13	16	18	20	11%	1.09	1.23	7%	0:00	1:35	1:35	\$0.00	\$1.00	N/A	17	18	20	22	19	22	25	26	2	4	5	4	130,053	136,766	5%	11.3	11.2	-1%								
I-5 SeaTac to Seattle ⁸	NB	13	8:20	13	16	29	33	14%	1.86	2.14	1%	4:45	5:10	0:25	\$2.54	\$3.47	37%	30	34	37	38	34	39	43	46	4	5	6	8	369,667	352,519	-5%	12.9	12.7	-2%								
I-405/I-90/I-5 Bellevue to Seattle	SB/WB/NB	10	8:25	10	12	17	19	12%	1.39	1.55	0%	2:10	2:35	0:25	\$1.17	\$1.53	31%	17	20	21	24	19	23	24	26	2	3	3	2	190,896	189,385	-1%	9.2	9.1	-1%								
I-405/SR 520/I-5 Bellevue to Seattle	NB/WB/SB	10	8:35	10	12	15	17	13%	1.22	1.38	8%	2:35	3:25	0:50	\$0.76	\$0.99	30%	15	16	17	19	16	18	22	25	1	2	4	6	85,222	89,753	5%	9.0	8.8	-2%								
To Bellevue																																											
I-5/I-405 Everett to Bellevue	SB	24	7:15	24	28	52	58	12%	1.81	2.04	0%	3:25	4:00	0:35	\$4.45	\$5.93	33%	51	65	73	81	57	75	84	95	5	10	11	14	477,815	463,351	-3%	21.1	21.1	0%								
I-405 Lynnwood to Bellevue	SB	16	7:25	16	19	41	47	15%	2.12	2.41	-1%	3:30	4:10	0:40	\$4.09	\$5.21	27%	42	53	59	66	47	61	67	73	5	8	8	7	333,731	327,527	-2%	14.7	14.9	1%								
I-405 Tukwila to Bellevue	NB	13	7:30	13	16	33	39	18%	2.05	2.39	-1%	4:05	5:05	1:00	\$3.28	\$4.26	30%	33	39	44	48	39	46	49	52	6	6	6	4	242,725	247,426	2%	13.1	13.2	1%								
I-5/I-90/I-405 Seattle to Bellevue	SB/EB/NB	11	8:35	11	13	16	16	0%	1.26	1.28	5%	1:55	2:20	0:25	\$0.82	\$0.86	5%	15	18	20	22	16	18	20	22	1	0	0	0	177,310	183,812	4%	9.5	9.3	-2%								
I-5/SR 520/ I-405 Seattle to Bellevue	NB/EB/SB	10	8:45	10	12	15	18	20%	1.24	1.43	12%	1:30	2:25	0:55	\$0.72	\$1.08	50%	14	17	20	22	17	21	23	26	3	3	2	4	87,999	90,016	2%	8.9	8.7	-2%								
I-90/I-405 Issaquah to Bellevue	WB/NB	9	7:40	9	11	14	15	7%	1.28	1.32	3%	1:45	1:45	0:00	\$0.75	\$0.86	15%	14	17	20	23	14	18	21	23	0	1	1	0	176,855	177,040	0%	8.2	8.0	-2%								
SR 520/I-405 Redmond to Bellevue	WB/SB	6	7:45	6	7	8	9	13%	1.10	1.23	18%	0:00	3:10	3:10	\$0.00	\$0.46	N/A	8	9	9	10	9	10	11	12	1	1	2	2	71,471	76,046	6%	5.2	5.2	0%								
Other																																											
I-405 Bellevue to Tukwila	SB	13	7:40	13	16	18	18	0%	1.12	1.12	1%	0:05	0:15	0:10	\$0.62	\$0.63	2%	17	20	23	25	17	20	22	24	0	0	0	-1	213,770	206,294	-3%	11.6	11.1	-4%								
I-405/SR 520 Bellevue to Redmond	NB/EB	5	9:25	5	7	8	7	-13%	1.29	1.07	5%	2:45	0:00	-2:45	\$0.43	\$0.00	-100%	7	11	12	14	7	7	7	8	0	-3	-5	-6	39,930	41,921	5%	4.7	4.6	-2%								
SR 167 Auburn to Renton ⁹	NB	10	7:45	10	12	18	18	0%	1.50	1.54	-3%	3:25	3:40	0:15	\$1.10	\$1.28	16%	16	22	25	28	17	23	26	30	1	1	2	2	158,851	154,944	-2%	9.5	9.3	-2%								
I-5/I-90 Seattle to Issaquah	SB/EB	16	8:40	16	19	20	20	0%	1.07	1.07	5%	0:00	0:00	0:00	\$0.00	\$0.00	N/A	19	22	24	26	20	22	24	25	1	1	0	-1	216,557	221,854	2%	13.4	13.1	-2%								
I-5/SR 520 Seattle to Redmond	NB/EB	13	8:45	13	16	18	20	11%	1.10	1.22	5%	0:00	0:55	0:55	\$0.00	\$0.92	N/A	16	20	23	25	19	23	25	29	2	3	2	4	107,600	111,798	4%	11.1	11.0	-1%								

Data source: WSDOT Office of Strategic Assessment and Performance Analysis, WSDOT Northwest Region Traffic Office, Washington State Transportation Center (TRAC) at the University of Washington, King County Metro, Sound Transit, Community Transit and the Puget Sound Regional Council (PSRC).
Notes: The symbol “Δ” is used to denote change in a variable. Commute lengths and travel time values have been rounded to integer values for publication only. MT³ Index values cannot be reproduced as published using the integer values in the table. 1 Commute congestion cost based on \$21.90 for every hour of congested conditions measured when commute speeds are slower than 45 mph, applied to the volume of traffic during the congested conditions on an average annual weekday commute. 2 Per-person metrics were estimated based on vehicle occupancy observed on the freeway in the single occupant vehicle lanes. 3 Greenhouse gas emissions were calculated based on emission factors developed by PSRC for different vehicle types at varying travel speeds for each analysis year. In addition, the emissions used the traffic volume and percent of trucks, the average speeds for every 5-minute interval during the peak period, and the average vehicle occupancy on the freeway. 4 Transit performance: Ridership was reported for the peak transit commute periods (6-9 a.m. and 3-6 p.m.). 5 Average load represents utilization of the available transit capacity based on the average maximum load of each bus or train trip and the total seats on the bus or train. Individual trips could show a load greater than 100% if there was standing-room only. Averaging the load for each commute levels out this variation across multiple trips, and may under-represent the load experienced during the peak utilization of transit. 6 Transit travel times include off-highway travel such as exiting to stop at a transit center and may not be directly comparable to private auto times which only include highway travel. 7 Greenhouse gas emissions avoided by transit use were estimated based on the following factors: a) the average maximum transit load; b) the assumption that for every transit passenger mile traveled, 0.62 miles of single-occupant vehicle travel is avoided; c) the distance traveled on the WSDOT-defined commute trip (not the entire transit trip); d) the average emissions of one pound of CO₂e for every mile traveled; and e) the emissions from transit vehicle operations provided by the transit agencies. 8 Transit services include buses and Sounder commuter trains. 9 Transit services include buses and Link light rail trains.

Central Puget Sound Region

Commute trip analysis

Evening commutes: Changes in travel time performance, congestion, reliability, emissions and transit performance for 21 evening high-demand commute trips in the central Puget Sound region
2012 and 2014; Evening peak (2-8 p.m.) for an annualized average weekday; 5-minute peak of commuter rush (individual peak times vary); Length of route in miles; All travel times in minutes; Peak of commuter rush and duration of congestion expressed in hours and minutes; Cost of congestion in dollars; Emissions in pounds of carbon dioxide equivalents (CO₂e); Average transit ridership, average load, and emissions avoided based on the average maximum load during the peak period

Evening				Travel Times										Congestion										Reliability										Emissions									
Route	Direction of travel	Length of route	Peak time	Travel time at posted speed	Travel time at maximum throughput speed	Average travel time at peak of morning commute			Maximum throughput travel time index (MT ³ I)		Peak period %Δ in VMT	Duration of congestion: How long average speed is below 45 mph			Cost of congestion ¹ per person ² , per trip			2012 percentiles				2014 percentiles				Δ: 2012 vs. 2014				Greenhouse gas emissions ³ in pounds of CO ₂ e													
						2012	2014	%Δ	2012	2014		2012	2014	%Δ	2012	2014	%Δ	Median	50th	80th	90th	95th	Median	50th	80th	90th	95th	Median	50th	80th	90th	95th	Emitted during peak period			Emitted per person ²							
																																	2012	2014	%Δ	2012	2014	%Δ	2012	2014	%Δ	2012	2014
From Seattle																																											
I-5 Seattle to Everett ⁸	NB	23	16:45	23	28	38	44	16%	1.35	1.58	0%	2:45	3:15	0:30	\$2.10	\$3.26	55%	38	45	50	55	44	53	59	63	6	7	8	8	732,827	755,971	3%	18.2	18.5	2%								
I-5 Seattle to Federal Way ⁸	SB	22	16:10	22	27	32	35	9%	1.20	1.31	-1%	1:55	2:55	1:00	\$1.34	\$1.80	34%	30	36	42	46	33	40	47	52	2	4	5	6	819,283	806,777	-2%	19.1	18.4	-4%								
I-5 Seattle to SeaTac ⁹	SB	13	16:10	13	16	19	22	16%	1.24	1.42	1%	2:05	3:00	0:55	\$0.92	\$1.35	47%	18	22	26	30	21	26	30	36	3	3	4	6	468,000	457,772	-2%	11.2	10.8	-4%								
I-5/I-90/I-405 Seattle to Bellevue	SB/EB/NB	11	17:25	11	13	18	17	-6%	1.39	1.34	2%	2:20	1:55	-0:25	\$1.04	\$0.93	-11%	16	22	26	29	15	20	25	29	-1	-1	-1	0	260,842	261,137	0%	8.9	8.6	-3%								
I-5/SR 520/I-405 Seattle to Bellevue	NB/EB/SB	10	17:35	10	12	17	17	0%	1.40	1.41	3%	3:10	3:25	0:15	\$1.00	\$1.10	10%	17	21	22	24	17	20	21	24	0	-1	-1	0	100,527	100,565	0%	8.5	8.3	-2%								
I-5/SR 520 Seattle to Redmond	NB/EB	13	17:40	13	16	17	18	6%	1.06	1.14	3%	0:00	0:30	0:30	\$0.00	\$0.64	N/A	16	19	21	22	18	21	23	24	2	2	2	2	150,774	159,103	6%	10.5	10.3	-2%								
I-5/I-90 Seattle to Issaquah	SB/EB	16	17:25	16	19	23	22	-4%	1.21	1.17	3%	1:20	0:55	-0:25	\$1.06	\$0.85	-20%	21	27	32	34	20	25	29	33	0	-2	-3	-1	389,041	386,110	-1%	13.5	13.1	-3%								
From Bellevue																																											
I-405/I-5 Bellevue to Everett	NB	23	16:50	23	28	40	46	15%	1.44	1.66	-3%	3:05	3:45	0:40	\$2.63	\$3.68	40%	41	48	53	57	47	53	59	62	6	5	6	5	584,481	545,771	-7%	18.8	18.6	-1%								
I-405 Bellevue to Lynnwood	NB	16	16:50	16	19	32	37	16%	1.66	1.96	-5%	3:25	4:00	0:35	\$2.66	\$3.72	40%	32	39	44	47	38	44	49	53	6	5	5	6	405,563	382,443	-6%	13.9	13.8	-1%								
I-405 Bellevue to Tukwila	SB	13	16:45	13	16	34	37	9%	2.12	2.33	-1%	5:40	6:35	0:55	\$3.42	\$3.91	14%	34	39	42	45	37	42	44	47	3	3	2	2	296,585	291,244	-2%	12.0	12.0	0%								
I-405/I-90/I-5 Bellevue to Seattle	SB/WB/NB	10	17:20	10	12	27	29	7%	2.24	2.37	-1%	4:40	4:55	0:15	\$2.50	\$2.75	10%	27	36	40	43	30	36	40	44	3	0	0	1	240,582	244,262	2%	9.2	9.2	0%								
I-405/SR 520/I-5 Bellevue to Seattle	NB/WB/SB	10	17:25	10	12	26	22	-15%	2.06	1.80	6%	5:35	7:20	1:45	\$2.00	\$1.69	-16%	26	30	34	36	20	24	32	36	-6	-6	-2	0	140,436	137,584	-2%	8.9	8.6	-3%								
I-405/I-90 Bellevue to Issaquah	SB/EB	9	17:20	9	11	18	18	0%	1.59	1.58	1%	4:10	4:15	0:05	\$1.32	\$1.32	0%	18	20	21	22	18	20	21	22	0	0	0	0	248,684	247,211	-1%	8.3	8.0	-4%								
I-405/SR 520 Bellevue to Redmond	NB/EB	5	17:35	5	7	8	8	0%	1.26	1.25	6%	1:25	1:25	0:00	\$0.39	\$0.39	0%	8	10	11	12	7	9	11	12	0	0	0	0	75,247	82,721	10%	4.5	4.4	-2%								
Other																																											
I-5 Everett to Seattle	SB	24	16:05	24	28	49	52	6%	1.74	1.84	0%	4:35	6:25	1:50	\$3.99	\$3.69	-8%	48	61	67	73	52	64	73	76	3	3	6	3	633,258	646,406	2%	19.0	19.3	2%								
I-90/I-5 Issaquah to Seattle	WB/NB	15	17:15	15	19	29	31	7%	1.58	1.67	0%	3:00	3:15	0:15	\$2.23	\$2.52	13%	28	37	41	49	30	38	44	49	2	1	3	0	312,924	309,546	-1%	13.7	13.4	-2%								
SR 520/I-5 Redmond to Seattle	WB/SB	13	17:30	13	16	31	32	3%	1.92	2.02	3%	4:15	4:25	0:10	\$2.32	\$2.57	11%	28	39	48	54	30	44	54	60	2	5	6	6	173,283	169,149	-2%	11.3	11.1	-2%								
SR 520/I-405 Redmond to Bellevue	WB/SB	6	17:25	6	7	16	19	19%	2.20	2.57	1%	4:20	5:25	1:05	\$1.57	\$1.77	13%	14	23	30	37	15	28	36	43	1	6	6	6	72,929	72,202	-1%	5.3	5.4	2%								
I-5 SeaTac to Seattle ⁹	NB	13	17:15	13	16	23	25	9%	1.48	1.59	-2%	2:50	3:45	0:55	\$1.44	\$1.81	26%	22	29	33	38	23	31	36	41	2	2	2	3	389,791	357,161	-8%	11.4	11.1	-3%								
SR 167 Renton to Auburn ⁸	SB	10	15:45	10	12	17	19	12%	1.45	1.60	0%	3:35	3:50	0:15	\$1.15	\$1.46	27%	15	22	25	29	17	24	29	32	2	3	4	3	196,634	192,728	-2%	8.8	8.7	-1%								
I-405 Tukwila to Bellevue	NB	13	17:20	13	16	23	22	-4%	1.45	1.36	-2%	2:20	3:00	0:40	\$1.32	\$1.15	-13%	22	30	33	38	20	26	32	36	-1	-4	-1	-2	299,222	287,412	-4%	11.2	10.7	-4%								

Data source: WSDOT Office of Strategic Assessment and Performance Analysis, WSDOT Northwest Region Traffic Office, Washington State Transportation Center (TRAC) at the University of Washington, King County Metro, Sound Transit, Community Transit and the Puget Sound Regional Council (PSRC).
Notes: The symbol “Δ” is used to denote change in a variable. Commute lengths and travel time values have been rounded to integer values for publication only. MT³ Index values cannot be reproduced as published using the integer values in the table. 1 Commute congestion cost based on \$21.90 for every hour of congested conditions measured when commute speeds are slower than 45 mph, applied to the volume of traffic during the congested conditions on an average annual weekday commute. 2 Per-person metrics were estimated based on vehicle occupancy observed on the freeway in the single occupant vehicle lanes. 3 Greenhouse gas emissions were calculated based on emission factors developed by PSRC for different vehicle types at varying travel speeds for each analysis year. In addition, the emissions used the traffic volume and percent of trucks, the average speeds for every 5-minute interval during the peak period, and the average vehicle occupancy on the freeway. 4 Transit performance: Ridership was reported for the peak transit commute periods (6-9 a.m. and 3-6 p.m.). 5 Average load represents utilization of the available transit capacity based on the average maximum load of each bus or train trip and the total seats on the bus or train. Individual trips could show a load greater than 100% if there was standing-room only. Averaging the load for each commute levels out this variation across multiple trips, and may under-represent the load experienced during the peak utilization of transit. 6 Transit travel times include off-highway travel such as exiting to stop at a transit center and may not be directly comparable to private auto times which only include highway travel. 7 Greenhouse gas emissions avoided by transit use were estimated based on the following factors: a) the average maximum transit load; b) the assumption that for every transit passenger mile traveled, 0.62 miles of single-occupant vehicle travel is avoided; c) the distance traveled on the WSDOT-defined commute trip (not the entire transit trip); d) the average emissions of one pound of CO₂e for every mile traveled; and e) the emissions from transit vehicle operations provided by the transit agencies. 8 Transit services include buses and Sounder commuter trains. 9 Transit services include buses and Link light rail trains.

Transit commute trip analysis

Morning transit commutes: Changes in transit travel time performance, ridership, and greenhouse gas (GHG) emissions for 19 morning high-demand commute trips in the central Puget Sound region
2012 and 2014; Morning peak (6-9 a.m.) for an annualized average weekday; 5-minute peak of commuter rush in hours and minutes (individual peak times vary); All travel times in minutes; Emissions in pounds of carbon dioxide equivalents (CO₂e); Average transit ridership, average seats used, and emissions avoided based on the average maximum load during the peak period

Morning				Travel Times											Ridership											Emissions												
Route	Direction of travel	Length of route	Peak time	Travel times in minutes at peak of morning commute ¹											Ridership ²			Passenger miles traveled			Lane capacity savings ³			Average percent of seats used ⁴			Number of trips			Percent of trips over 90% capacity			Daily emissions avoided due to transit use ⁵			Vehicle miles traveled avoided due to transit use		
				Auto 95% reliable			Transit average			Transit 95% reliable																												
				2012	2014	Δ	2012	2014	Δ	2012	2014	Δ	2012	2014	%Δ	2012	2014	%Δ	2012	2014	%Δ	2012	2014	%Δ	2012	2014	%Δ	2012	2014	%Δ	2012	2014	%Δ	2012	2014	%Δ		
To Seattle																																						
I-5 Everett to Seattle ⁷	SB	24	7:25	76	85	9	-	68	-	-	89	-	10,447	11,975	15%	181,109	203,019	12%	1.85	2.12	15%	74%	79%	5%	213	230	8%	30%	33%	3%	90,890	103,244	14%	112,288	125,872	12%		
I-5 Federal Way to Seattle ⁷	NB	22	7:15	66	76	10	35	40	5	46	51	5	8,004	8,096	1%	162,390	166,916	3%	1.41	1.43	1%	73%	70%	-3%	157	142	-10%	38%	29%	-9%	65,243	88,660	36%	100,682	103,488	3%		
I-90/I-5 Issaquah to Seattle	WB/NB	15	7:40	40	42	2	-	28	-	-	31	-	4,303	4,580	6%	55,571	54,918	-1%	0.75	0.80	6%	99%	116%	17%	79	73	-8%	67%	77%	10%	28,463	29,041	2%	34,454	34,049	-1%		
SR 520/I-5 Redmond to Seattle	WB/SB	13	8:35	22	26	4	-	29	-	-	30	-	6,117	6,589	8%	63,154	68,000	8%	1.13	1.21	8%	101%	109%	8%	119	117	-2%	56%	70%	14%	32,715	35,690	9%	39,156	42,160	8%		
I-5 SeaTac to Seattle ⁶	NB	13	8:20	38	46	8	37	37	0	40	38	-2	5,500	6,120	11%	52,073	59,658	15%	0.97	1.08	11%	90%	102%	12%	74	73	-1%	54%	71%	17%	23,920	28,808	20%	32,285	36,988	15%		
I-405/I-90/I-5 Bellevue to Seattle	SB/WB/NB	10	8:25	24	26	2	-	27	-	-	28	-	3,176	3,232	2%	22,473	21,990	-2%	0.57	0.58	2%	120%	115%	-6%	48	50	4%	85%	74%	-11%	12,066	11,621	-4%	13,934	13,634	-2%		
I-405/SR 520/I-5 Bellevue to Seattle	NB/WB/SB	10	8:35	19	25	6	-	26	-	-	29	-	1,330	1,363	2%	7,739	7,973	3%	0.24	0.25	2%	81%	88%	7%	35	33	-6%	43%	48%	6%	3,726	3,965	6%	4,798	4,943	3%		
To Bellevue																																						
I-5/I-405 Everett to Bellevue	SB	24	7:15	81	95	14	-	71	-	-	87	-	628	736	17%	14,884	17,443	17%	0.11	0.13	17%	85%	94%	9%	14	14	0%	29%	64%	36%	7,459	9,046	21%	9,228	10,815	17%		
I-405 Lynnwood to Bellevue	SB	16	7:25	66	73	7	-	68	-	-	87	-	330	418	27%	4,892	5,997	23%	0.06	0.07	27%	69%	88%	18%	11	11	0%	9%	45%	36%	2,355	3,038	29%	3,033	3,718	23%		
I-405 Tukwila to Bellevue	NB	13	7:30	48	52	4	-	29	-	-	33	-	397	206	-48%	5,356	2,781	-48%	0.07	0.04	-48%	80%	46%	-34%	11	10	-9%	27%	0%	-27%	2,728	1,175	-57%	3,320	1,724	-48%		
I-5/I-90/I-405 Seattle to Bellevue	SB/EB/NB	11	8:35	22	22	0	-	27	-	-	27	-	1,108	1,184	7%	7,357	7,862	7%	0.20	0.21	7%	112%	120%	8%	17	17	0%	82%	88%	6%	3,897	4,210	8%	4,561	4,874	7%		
I-5/SR 520/ I-405 Seattle to Bellevue	NB/EB/SB	10	8:45	22	26	4	-	14	-	-	21	-	1,004	1,102	10%	5,006	5,859	17%	0.18	0.20	10%	76%	90%	13%	29	27	-7%	38%	52%	14%	2,346	2,930	25%	3,104	3,633	17%		
I-90/I-405 Issaquah to Bellevue	WB/NB	9	7:40	23	23	0	-	22	-	-	22	-	370	447	21%	3,123	3,773	21%	0.06	0.08	21%	106%	110%	4%	6	7	17%	83%	86%	2%	1,620	1,974	22%	1,936	2,339	21%		
SR 520/I-405 Redmond to Bellevue	WB/SB	6	7:45	10	12	2	15	17	2	17	22	5	153	179	17%	509	572	12%	0.03	0.03	17%	31%	39%	8%	12	11	-8%	0%	9%	9%	95	161	70%	316	355	12%		
Other																																						
I-405 Bellevue to Tukwila	SB	13	7:40	25	24	-1	-	29	-	-	33	-	133	59	-55%	1,758	785	-55%	0.02	0.01	-55%	40%	23%	-17%	8	7	-13%	0%	0%	0%	724	212	-71%	1,090	487	-55%		
I-405/SR 520 Bellevue to Redmond	NB/EB	5	9:25	14	8	-6	12	11	-1	16	14	-2	193	187	-3%	826	793	-4%	0.04	0.03	-3%	21%	22%	1%	22	21	-5%	0%	0%	0%	133	142	7%	512	492	-4%		
SR 167 Auburn to Renton ⁷	NB	10	7:45	28	30	2	28	32	4	32	40	8	1,108	984	-11%	10,394	9,604	-8%	0.20	0.17	-11%	49%	51%	2%	29	15	-48%	3%	0%	-3%	4,805	4,595	-4%	6,444	5,954	-8%		
I-5/I-90 Seattle to Issaquah	SB/EB	16	8:40	26	25	-1	-	26	-	-	27	-	614	655	7%	7,601	7,300	-4%	0.11	0.11	7%	71%	82%	11%	15	14	-7%	33%	36%	2%	3,576	3,598	1%	4,712	4,526	-4%		
I-5/SR 520 Seattle to Redmond	NB/EB	13	8:45	25	29	4	-	28	-	-	35	-	2,880	2,953	3%	30,387	31,785	5%	0.53	0.54	3%	84%	88%	4%	64	61	-5%	39%	43%	4%	15,480	16,348	6%	18,840	19,707	5%		

Data sources and analysis: Sound Transit, Pierce Transit, King County Metro, Community Transit, WSDOT Olympic Region Traffic Office, Washington State Transportation Center, and WSDOT Office of Strategic Assessment and Performance Analysis.

Notes: The symbol "Δ" is used to denote change in a variable. 1 Transit travel times include off-highway travel such as exiting to stop at a transit center and may not be directly comparable to private auto times which only include highway travel. 2 Ridership was reported for the peak transit commute periods (6-9 a.m. and 3-6 p.m.). 3 Lane capacity savings is a measure of how many general purpose lanes' worth of capacity transit ridership provides during the peak periods. See the addendum to WSDOT's methodology document at www.wsdot.wa.gov/CCR15_methodology_addendum.pdf for more calculation methods. 4 Average percent of seats used is based on the average maximum load of each bus or train trip and the total seats on the bus or train. Individual trips could show a load greater than 100% if there was standing-room only. Averaging the load for each commute levels out this variation across multiple trips, and may under-represent the load experienced during the peak utilization of transit. 5 Greenhouse gas emissions avoided by transit use were estimated based on the following factors: a) the average maximum transit load; b) the assumption that for every transit passenger mile traveled, 0.62 miles of single-occupant vehicle travel is avoided; c) the distance traveled on the WSDOT-defined commute trip (not the entire transit trip); d) the average emissions of one pound of CO₂e for every mile traveled; and e) the emissions from transit vehicle operations provided by the transit agencies. 6 Transit services include buses and Sounder commuter trains. 7 Transit services include buses and Link light rail trains.

Commute trip analysis

Additional 12 commutes: Changes in travel time performance, congestion and reliability

2012 and 2014; Morning peak (5-10 a.m.) and evening peak (2-8 p.m.) for an annualized average weekday; 5-minute peak of commuter rush (individual peak times vary); Length of route in miles; All travel times in minutes; Peak of commuter rush and duration of congestion expressed in hours and minutes

Morning				Travel Times									Congestion			Reliability		
Route	Direction of travel	Length of route	Peak time	Travel time at posted speed	Travel time at maximum throughput speed	Average travel time at peak of morning commute			Maximum throughput travel time index (MT ³ I)		Peak period %Δ in VMT	Duration of congestion - How long average speed is slower than 45 mph			95th percentiles			
						2012	2014	%Δ	2012	2014		2012	2014	Δ	2012	2014	%Δ	
From Seattle, Bellevue and Renton																		
I-5 Seattle to Everett	NB	23	9:50	23	28	24	25	4%	0.86	0.88	3%	0:00	0:00	0:00	25	27	8%	
I-5 Seattle to SeaTac	SB	13	7:50	13	16	15	14	-7%	0.94	0.91	3%	0:00	0:00	0:00	17	17	0%	
I-405 Bellevue to Lynnwood	NB	16	7:35	16	19	17	16	-6%	0.87	0.86	-1%	0:00	0:00	0:00	18	17	-6%	
SR 167 Renton to Auburn	SB	10	9:40	10	12	10	10	0%	0.89	0.88	3%	0:00	0:00	0:00	11	11	0%	
I-5 Seattle to Federal Way	SB	22	7:50	22	27	24	23	-4%	0.90	0.88	7%	0:00	0:00	0:00	26	26	0%	
I-405/I-5 Bellevue to Everett	NB	23	7:35	23	28	25	24	-4%	0.88	0.87	0%	0:00	0:00	0:00	25	25	0%	
I-405/I-90 Bellevue to Issaquah	EB	9	7:00	9	11	11	11	0%	0.96	0.96	1%	0:00	0:00	0:00	11	11	0%	

Evening

To Seattle, Bellevue and Renton

I-405 Lynnwood to Bellevue	SB	16	17:00	16	19	26	26	0%	1.35	1.35	-3%	2:05	2:45	0:40	41	44	7%
SR 167 Auburn to Renton	NB	10	15:40	10	12	11	11	0%	0.96	0.94	0%	0:00	0:00	0:00	16	16	0%
I-90/I-405 Issaquah to Bellevue	WB	9	17:20	9	11	12	13	8%	1.09	1.18	-1%	0:00	1:05	1:05	17	21	24%
I-5 Federal Way to Seattle	NB	22	17:05	22	27	33	34	3%	1.23	1.28	0%	1:35	2:15	0:40	48	54	13%
I-5/I-405 Everett to Bellevue	SB	24	16:50	24	28	35	35	0%	1.24	1.23	-2%	1:45	2:10	0:25	50	54	8%

Data sources and analysis: WSDOT Northwest Region Traffic Office, Washington State Transportation Center, and WSDOT Office of Strategic Assessment and Performance Analysis.

Notes: The symbol "Δ" is used to denote change in a variable. Commute lengths and travel time values have been rounded to integer values for publication only. MT³ Index values cannot be reproduced as published using the integer values in the table.

Reliability percentiles in plain English

Analyzing reliability based on travel times recorded on approximately 260 weekdays in a calendar year during the peak 5-minute interval

	Definition	Why do we measure this?
Average travel time (the mean)	Average of all the recorded travel times.	Describes the "average" experience on the road that year.
50th percentile travel time (the median)	Half of recorded travel times were shorter, half longer, than this duration.	The median is not affected by very large times as an average is, so it gives a better sense of actual conditions.
80th percentile travel time	80% of recorded travel times were shorter than this duration.	WSDOT uses this percentile to track changes in reliable travel times over the years at a finer level, to better evaluate operational improvements.
90th percentile travel time	90% of recorded travel times were shorter than this duration.	WSDOT uses this percentile to track changes in reliable travel times over the years at a finer level, to better evaluate operational improvements.
95th percentile travel time	95% of recorded travel times were shorter than this duration.	Allows commuters to plan how much time will be required to make a trip and be on time 19 days a month, on average (late one of 20 days).

Central Puget Sound Region

High occupancy vehicle (HOV) trip analysis

Morning commutes: HOV lane travel time performance compared to single occupant vehicle (SOV) lanes
 2012 and 2014; Morning peak (6-9 a.m.) for an annualized average weekday; 5-minute peak of commuter rush (individual peak times vary); Length of route in miles; All travel times and differences in minutes; Peak of commuter rush expressed in hours and minutes

Route	Direction of travel	Length of route	Peak time	Travel times on the route at		Average travel time at peak of morning rush					95% reliable travel times					
				Posted speed	Maximum throughput speed	HOV lanes		SOV lanes		2014: Δ HOV vs. SOV	HOV lanes		SOV lanes		2014: Δ HOV vs. SOV	
						2012	2014	Δ	2014		2012	2014	Δ	2014		
To Seattle																
I-5 Everett to Seattle																
Regular HOV lane	SB	24	7:25	24	28	37	45	8	51	-6	63	74	11	85	-11	
Reversible lanes	SB	24	7:25	24	28	34	43	9	51	-8	49	69	20	85	-16	
I-5 Federal Way to Seattle ¹	NB	22	7:15	22	27	33	39	6	52	-13	46	55	9	76	-21	
I-90/I-5 Issaquah to Seattle																
HOV & SOV lanes ¹	WB/NB	14	7:40	14	17	17	19	2	25	-6	22	23	1	38	-15	
HOV & reversible lanes ¹	WB/NB	14	7:40	14	17	15	16	1	25	-9	18	19	1	38	-19	
SR 520/I-5 Redmond to Seattle	WB/SB	13	8:35	13	16	19	19	0	20	-1	23	25	2	26	-1	
I-5 SeaTac to Seattle	NB	13	8:20	13	16	22	22	0	33	-11	29	30	1	46	-16	
I-405/I-90/I-5 Bellevue to Seattle																
HOV & SOV lanes ¹	SB/WB/NB	9	8:15	9	11	13	14	1	15	-1	17	18	1	21	-3	
HOV & reversible lanes ¹	SB/WB/NB	9	8:15	9	11	10	11	1	15	-4	11	13	2	21	-8	
I-405/SR 520/I-5 Bellevue to Seattle	NB/WB/SB	10	8:35	10	12	15	16	1	17	-1	18	23	5	25	-2	
To Bellevue																
I-5/I-405 Everett to Bellevue	SB	24	7:15	24	28	29	37	8	58	-21	40	56	16	95	-39	
I-405 Lynnwood to Bellevue	SB	16	7:25	16	19	20	27	7	47	-20	30	39	9	73	-34	
I-405 Tukwila to Bellevue	NB	13	7:30	13	16	16	22	6	39	-17	20	33	13	52	-19	
I-5/I-90/I-405 Seattle to Bellevue ¹	SB/EB/NB	9	8:40	9	11	11	12	1	13	-1	17	16	-1	17	-1	
I-90/I-405 Issaquah to Bellevue	WB/NB	9	7:40	9	11	11	12	1	15	-3	14	14	0	23	-9	
SR 520/I-405 Redmond to Bellevue	WB/SB	6	7:45	6	7	9	10	1	9	1	11	13	2	12	1	
To other locations																
I-405 Bellevue to Tukwila	SB	12	7:40	12	15	13	13	0	18	-5	14	13	-1	24	-11	
SR 167 Auburn to Renton (HOT)	NB	10	7:45	10	12	11	13	2	18	-5	15	20	5	30	-10	
I-5/I-90 Seattle to Issaquah ¹	SB/EB/NB	14	8:35	14	17	15	16	1	17	-1	20	19	-1	21	-2	
I-5/SR 520 Seattle to Redmond ³	NB/EB	13	8:45	13	16	18	20	2	20	0	26	29	3	29	0	

Data sources and analysis: WSDOT Northwest Region Traffic Office, Washington State Transportation Center, and WSDOT Office of Strategic Assessment and Performance Analysis.

Notes: Commute lengths have been rounded to integer values for publication purposes only. Trip routes on I-5 and I-90 include reversible lane options for the weekday time periods (morning or evening) and directions of travel when the reversible lanes are in effect. 1 Some HOV trips have modified trip lengths compared to the corresponding standard SOV trips in the central Puget Sound region due to the lack of data at the HOV trip's endpoints. Affected trips are on northbound I-5 from Federal Way to Seattle, and I-90 trips between Seattle and Issaquah, and between Bellevue and Seattle (both eastbound and westbound). In each case, to enable a direct comparison, the lengths of the corresponding SOV trips have been adjusted to match the HOV trip length as closely as possible; this means travel times and time stamps for the peak of the commuter rush for these modified SOV trips will not necessarily match those in the SOV trip tables on [pp. 17-18](#). 2 HOV trips with the same endpoints as SOV lane trips, but differing lengths, do not require any adjustment, since the difference in lengths is the result of HOVs using different roadways than SOVs (e.g., an HOV only interchange ramp). 3 The HOV trip on SR 520 eastbound from Seattle to Bellevue is no longer reported, because HOV lanes exist along only a very short portion of the route.

High occupancy vehicle (HOV) trip analysis

Evening commutes: HOV lane travel time performance compared to single occupant vehicle (SOV) lanes

2012 and 2014; Evening peak (3-6 p.m.) for an annualized average weekday; 5-minute peak of commuter rush (individual peak times vary); Length of route in miles; All travel times and differences in minutes; Peak of commuter rush expressed in hours and minutes

Route	Direction of travel	Length of route	Peak time	Travel times on the route at		Average travel time at peak of evening rush					95% reliable travel times					
				Posted speed	Maximum throughput speed	HOV lanes		SOV lanes		2014: Δ HOV vs. SOV	HOV lanes		SOV lanes		2014: Δ HOV vs. SOV	
						2012	2014	Δ	2014		2012	2014	Δ	2014		
From Seattle																
I-5 Seattle to Everett																
Regular HOV lane		NB	23	16:45	23	28	35	41	6	44	-3	49	56	7	63	-7
Reversible lanes		NB	23	16:45	23	28	29	33	4	44	-11	37	44	7	63	-19
I-5 Seattle to Federal Way		SB	22	16:10	22	27	29	32	3	35	-3	40	46	6	52	-6
I-5 Seattle to SeaTac		SB	13	16:10	13	16	18	21	3	22	-1	25	32	7	36	-4
I-5/I-90/I-405 Seattle to Bellevue																
HOV & SOV lanes¹		SB/EB/NB	9	17:20	9	11	12	12	0	13	-1	21	18	-3	23	-5
HOV & reversible lanes¹		SB/EB/NB	8	17:20	8	10	9	10	1	13	-3	10	11	1	23	-12
I-5/SR 520 Seattle to Redmond³		NB/EB	13	17:40	13	16	16	18	2	18	0	21	22	1	24	-2
I-5/I-90 Seattle to Issaquah																
HOV & SOV lanes¹		SB/EB	14	17:25	14	17	17	16	-1	18	-2	26	22	-4	26	-4
HOV & reversible lanes¹		SB/EB	14	17:25	14	17	14	15	1	18	-3	14	15	1	26	-11
From Bellevue																
I-405 Bellevue to Everett		NB	23	16:50	23	28	30	35	5	46	-11	41	48	7	62	-14
I-405 Bellevue to Lynnwood		NB	16	16:50	16	19	22	27	5	37	-10	32	39	7	53	-14
I-405 Bellevue to Tukwila		SB	12	16:45	12	15	19	21	2	37	-16	28	33	5	47	-14
I-405/I-90/I-5 Bellevue to Seattle¹		SB/WB/NB	9	17:20	9	11	18	18	0	24	-6	29	28	-1	35	-7
I-405/SR 520/I-5 Bellevue to Seattle		NB/WB/SB	10	17:25	10	12	19	17	-2	22	-5	25	23	-2	36	-13
I-405/I-90 Bellevue to Issaquah		SB/EB	9	17:20	9	11	15	16	1	18	-2	20	21	1	22	-1
I-405/SR 520 Bellevue to Redmond		NB/EB	5	17:35	5	7	8	7	-1	8	-1	11	9	-2	12	-3
From other locations																
I-5 Everett to Seattle		SB	24	16:05	24	28	46	48	2	52	-4	64	69	5	76	-7
I-90/I-5 Issaquah to Seattle¹		WB/NB	14	16:45	14	17	19	19	0	26	-7	28	27	-1	43	-16
SR 520/I-5 Redmond to Seattle		WB/SB	13	17:30	13	16	23	22	-1	32	-10	36	37	1	60	-23
I-5 SeaTac to Seattle		NB	13	17:15	13	16	18	19	1	25	-6	25	29	4	41	-12
SR 167 Renton to Auburn (HOT)		SB	10	15:45	10	12	12	12	0	19	-7	15	16	1	32	-16
I-405 Tukwila to Bellevue		NB	13	17:20	13	16	14	14	0	22	-8	16	16	0	36	-20

Data sources and analysis: WSDOT Northwest Region Traffic Office, Washington State Transportation Center, and WSDOT Office of Strategic Assessment and Performance Analysis.

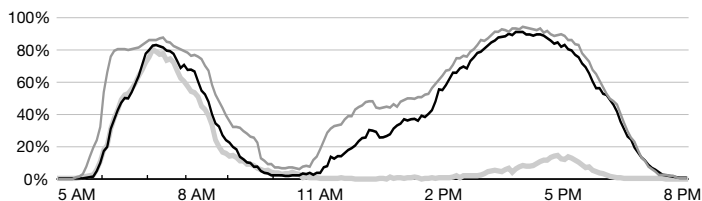
Notes: Commute lengths have been rounded to integer values for publication purposes only. Trip routes on I-5 and I-90 include reversible lane options for the weekday time periods (morning or evening) and directions of travel when the reversible lanes are in effect. 1 Some HOV trips have modified trip lengths compared to the corresponding standard SOV trips in the central Puget Sound region due to the lack of data at the HOV trip's endpoints. Affected trips are on northbound I-5 from Federal Way to Seattle, and I-90 trips between Seattle and Issaquah, and between Bellevue and Seattle (both eastbound and westbound). In each case, to enable a direct comparison, the lengths of the corresponding SOV trips have been adjusted to match the HOV trip length as closely as possible; this means travel times and time stamps for the peak of the commuter rush for these modified SOV trips will not necessarily match those in the SOV trip tables on [pp. 17-18](#). 2 HOV trips with the same endpoints as SOV lane trips, but differing lengths, do not require any adjustment, since the difference in lengths is the result of HOVs using different roadways than SOVs (e.g., an HOV only interchange ramp). 3 The HOV trip on SR 520 eastbound from Seattle to Bellevue is no longer reported, because HOV lanes exist along only a very short portion of the route.

HOV stamp graphs: Frequency, duration of congestion

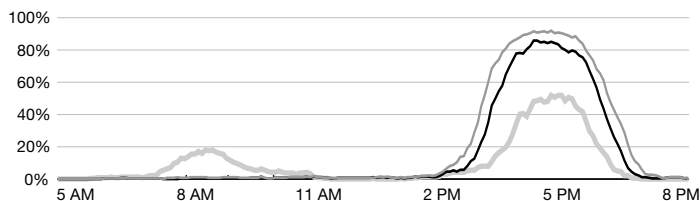
Comparing HOV and adjacent SOV lanes: Percent of weekdays experiencing congestion (part 1)

2014; Percent of days average speed was slower than 45 mph on HOV and SOV lanes

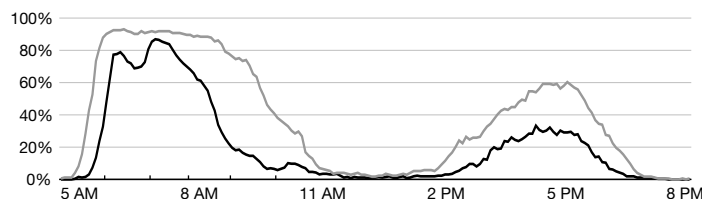
Everett to Seattle via I-5



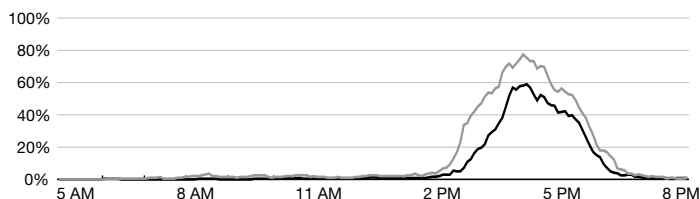
Seattle to Everett via I-5



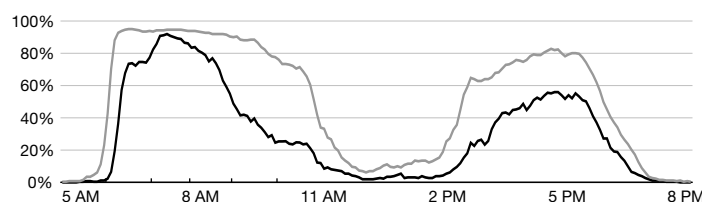
Federal Way to Seattle via I-5



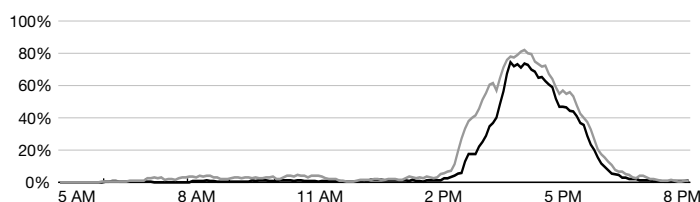
Seattle to Federal Way via I-5



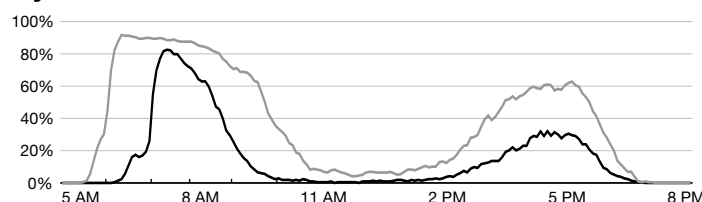
SeaTac to Seattle via I-5



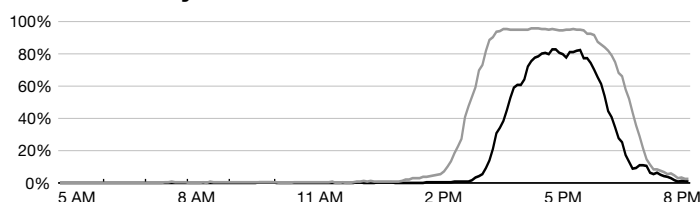
Seattle to SeaTac via I-5



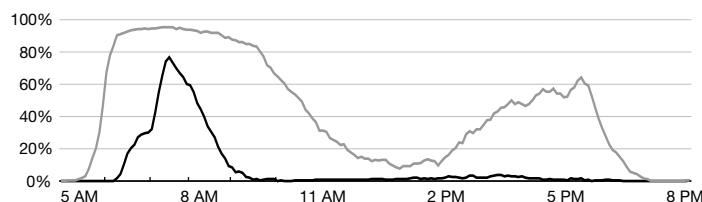
Lynnwood to Bellevue via I-405



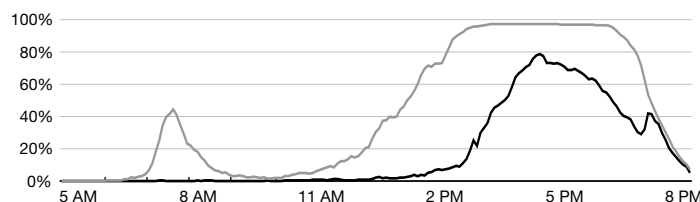
Bellevue to Lynnwood via I-405



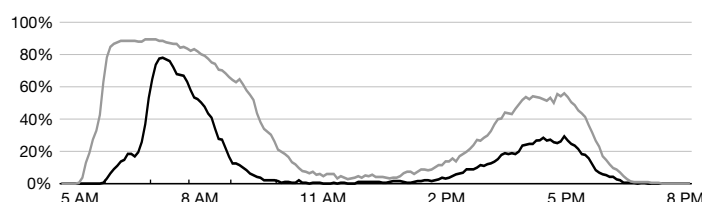
Tukwila to Bellevue via I-405



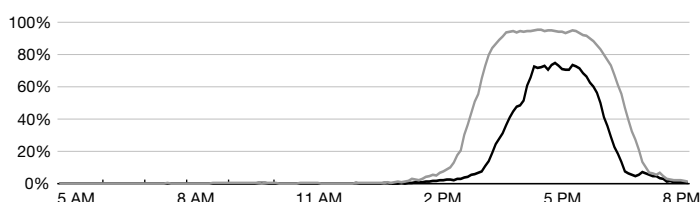
Bellevue to Tukwila via I-405



Everett to Bellevue via I-5/I-405



Bellevue to Everett via I-405/I-5



Data sources and analysis: Washington State Transportation Center and WSDOT Office of Strategic Assessment and Performance Analysis.

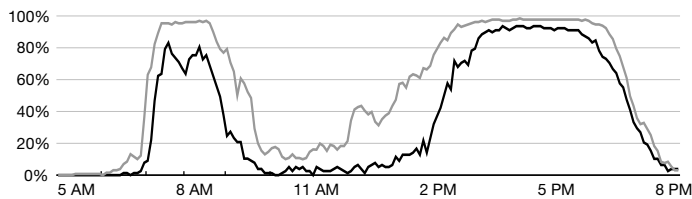
Note: See p. 2 for congestion definitions and how to read these graphs.

— SOV lanes — HOV lanes — Reversible lanes

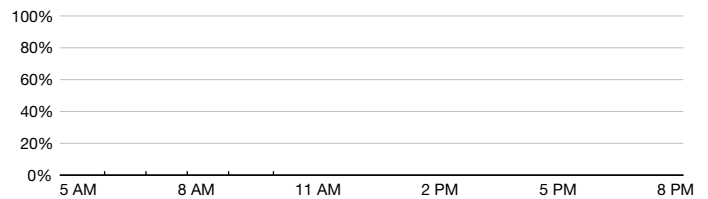
HOV stamp graphs: Frequency, duration of congestion

Comparing HOV and adjacent SOV lanes: Percent of weekdays experiencing congestion (part 2)
 2014; Percent of days average speed was slower than 45 mph on HOV and SOV lanes

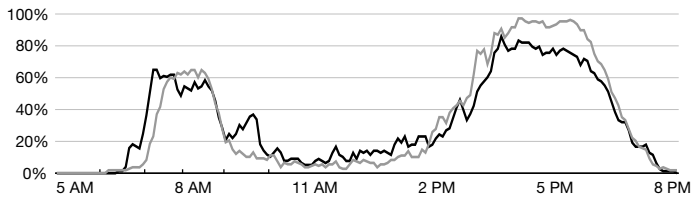
Bellevue to Seattle via I-405/SR 520/I-5



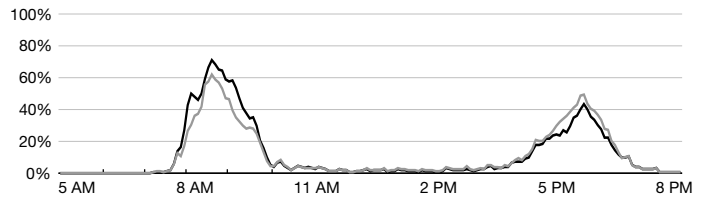
Seattle to Bellevue via I-5/SR 520/I-405



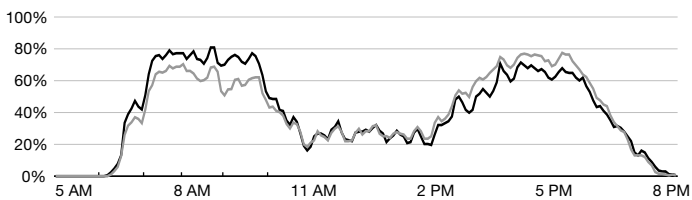
Redmond to Seattle via SR 520/I-5



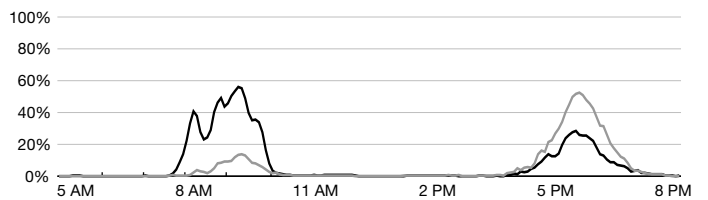
Seattle to Redmond via I-5/SR 520



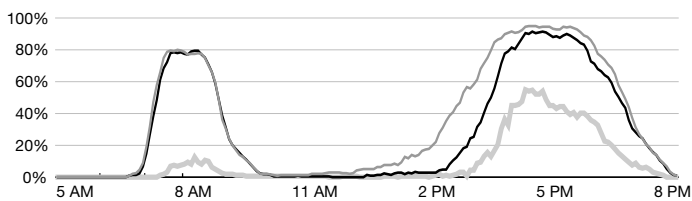
Redmond to Bellevue via SR 520/I-405



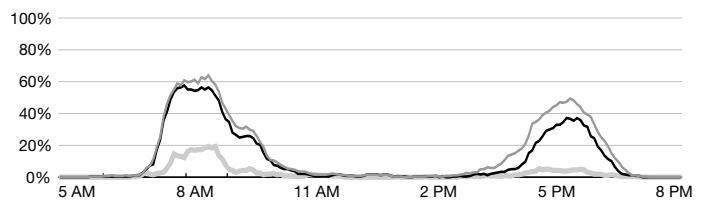
Bellevue to Redmond via I-405/SR 520



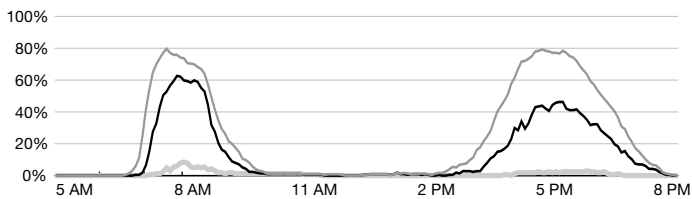
Bellevue to Seattle via I-405/I-90/I-5



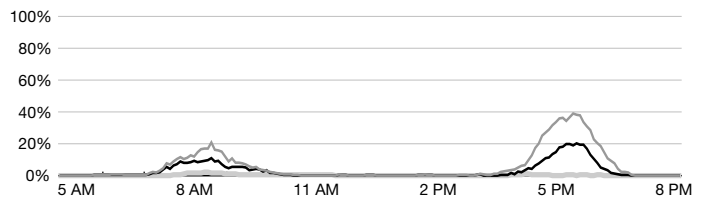
Seattle to Bellevue via I-5/I-90/I-405



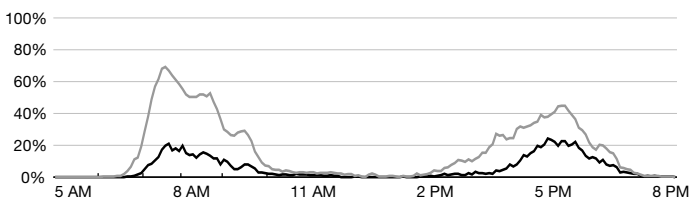
Issaquah to Seattle via I-90/I-5



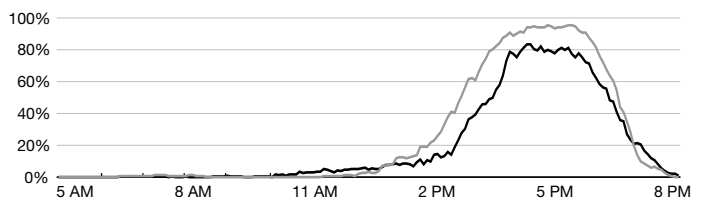
Seattle to Issaquah via I-5/I-90



Issaquah to Bellevue via I-90/I-405



Bellevue to Issaquah via I-405/I-90



Data sources and analysis: Washington State Transportation Center and WSDOT Office of Strategic Assessment and Performance Analysis.

Note: See p. 2 for congestion definitions and how to read these graphs.

— SOV lanes — HOV lanes — Reversible lanes

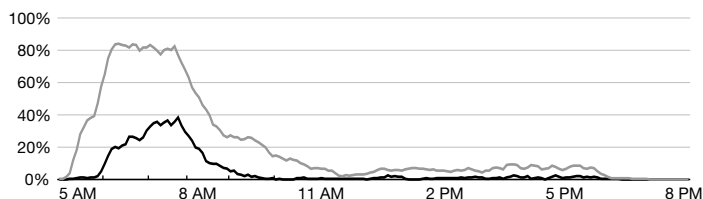
Central Puget Sound Region

HOV stamp graphs and reliability performance

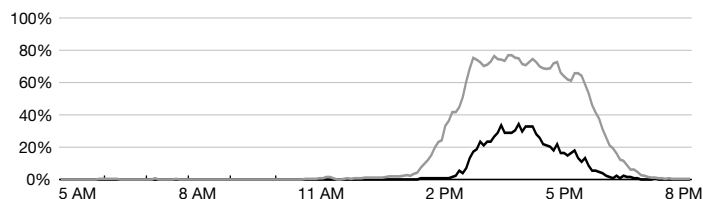
Comparing HOV and adjacent SOV lanes: Percent of weekdays experiencing congestion (part 3)

2014; Percent of days average speed was slower than 45 mph on HOV and SOV lanes

Auburn to Renton via SR 167



Renton to Auburn via SR 167



Data sources and analysis: Washington State Transportation Center and WSDOT Office of Strategic Assessment and Performance Analysis.

Notes: See p. 2 for congestion definitions and how to read these graphs.

— SOV lanes — HOV lanes

High occupancy vehicle lane speed and reliability performance on major central Puget Sound corridors

2010 through 2014; Goal is to maintain 45 mph for 90% of peak hour

= Goal not met

Commute routes	2010	2011	2012	2013	2014	Commute routes	2010	2011	2012	2013	2014
Morning peak period commutes						Evening peak period commutes					
I-5, Everett to Seattle SB	61%	64%	54%	42%	28%	I-5, Seattle to Everett NB	55%	76%	68%	66%	46%
I-5, Federal Way to Seattle NB	86%	72%	51%	43%	30%	I-5, Seattle to Federal Way SB	77%	82%	63%	53%	40%
I-405, Lynnwood to Bellevue SB	92%	94%	76%	54%	36%	I-405, Bellevue to Lynnwood NB	77%	74%	56%	46%	19%
I-405, Tukwila to Bellevue NB	99%	98%	93%	65%	35%	I-405, Bellevue to Tukwila SB	74%	60%	43%	41%	26%
I-90, Issaquah to Seattle WB	100%	100%	100%	100%	98%	I-90, Seattle to Issaquah EB	99%	99%	100%	99%	100%
SR 520, Redmond to Bellevue WB	94%	94%	97%	51%	50%	SR 520, Redmond to Bellevue WB	61%	70%	54%	52%	52%
SR 167, Auburn to Renton NB ¹	100%	99%	96%	94%	86%	SR 167, Renton to Auburn SB ¹	99%	99%	98%	98%	98%

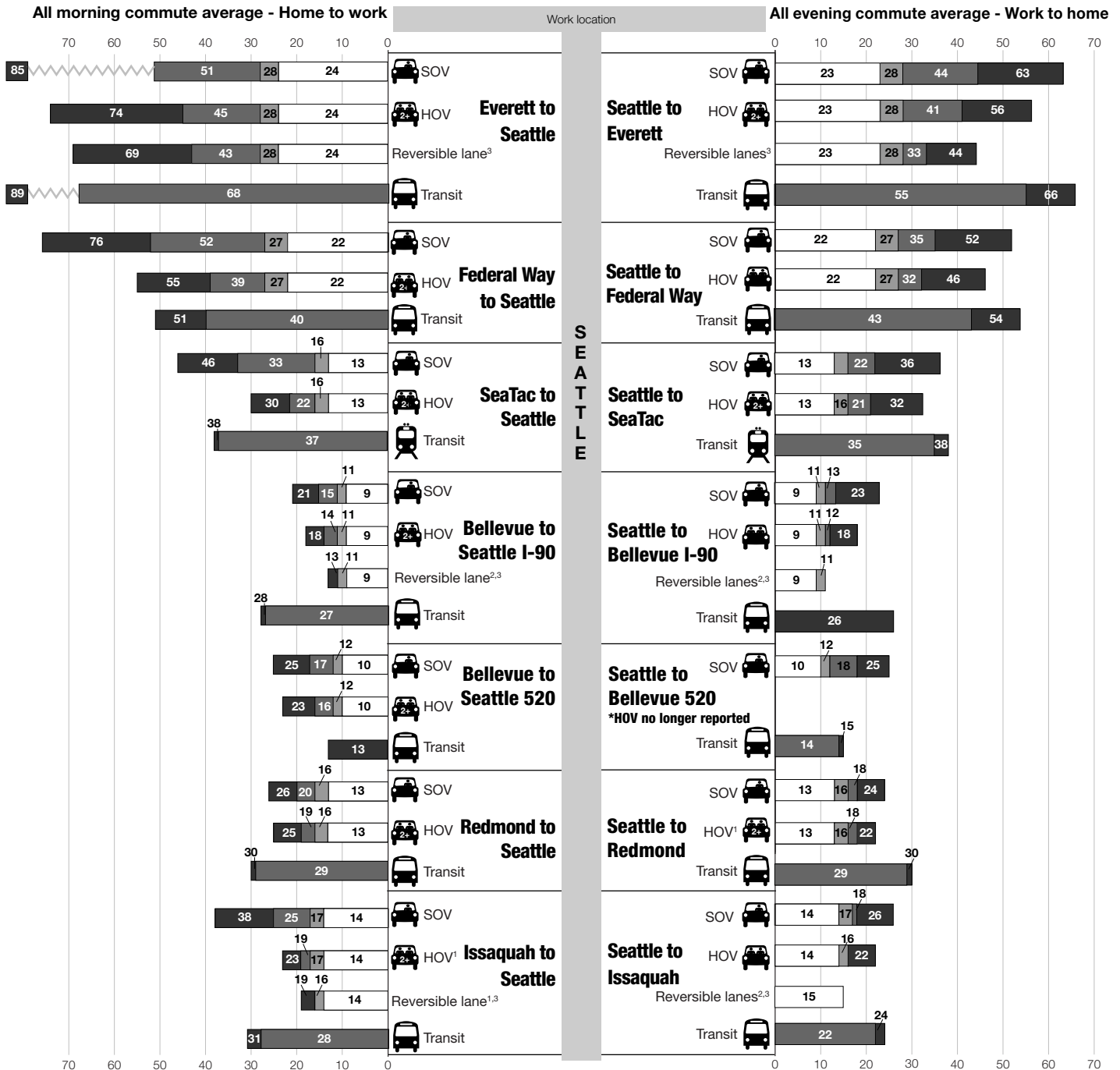
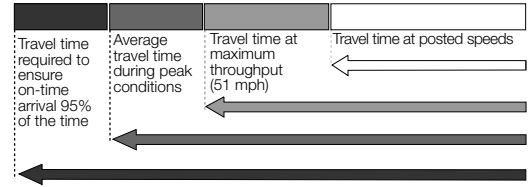
Data source: Washington State Transportation Center.

Notes: HOV reliability performance standards are based on the peak hour, the one-hour period during each peak period when average travel time is slowest. To meet the standard, a speed of 45 mph must be maintained for 90% of the peak hour. Numbers represent the percentage of the peak hour when speeds are faster than 45 mph. Washington State Transportation Center analyzes performance data for all complete segments of HOV lanes that have a loop detector. In some cases, data cannot be analyzed for the very beginning and ends of the lanes because there are no detectors at these locations. ¹ High occupancy toll (HOT) lanes replaced regular HOV lanes May 3, 2008.

HOV, SOV and transit trip analysis – Seattle

Travel times at posted speeds, maximum throughput speeds, peak travel times, and 95th percentile reliable travel times
Morning and evening commutes by work location

2014: Single occupant vehicle (SOV), high occupancy vehicle (HOV) and public transit commutes in the central Puget Sound area, travel time in minutes
Morning and evening commutes by work location
2014: Single occupant vehicle (SOV), high occupancy vehicle (HOV) and public transit commutes in the central Puget Sound region; Travel times in minutes



Data sources and analysis: Washington State Transportation Center and WSDOT Office of Strategic Assessment and Performance Analysis.

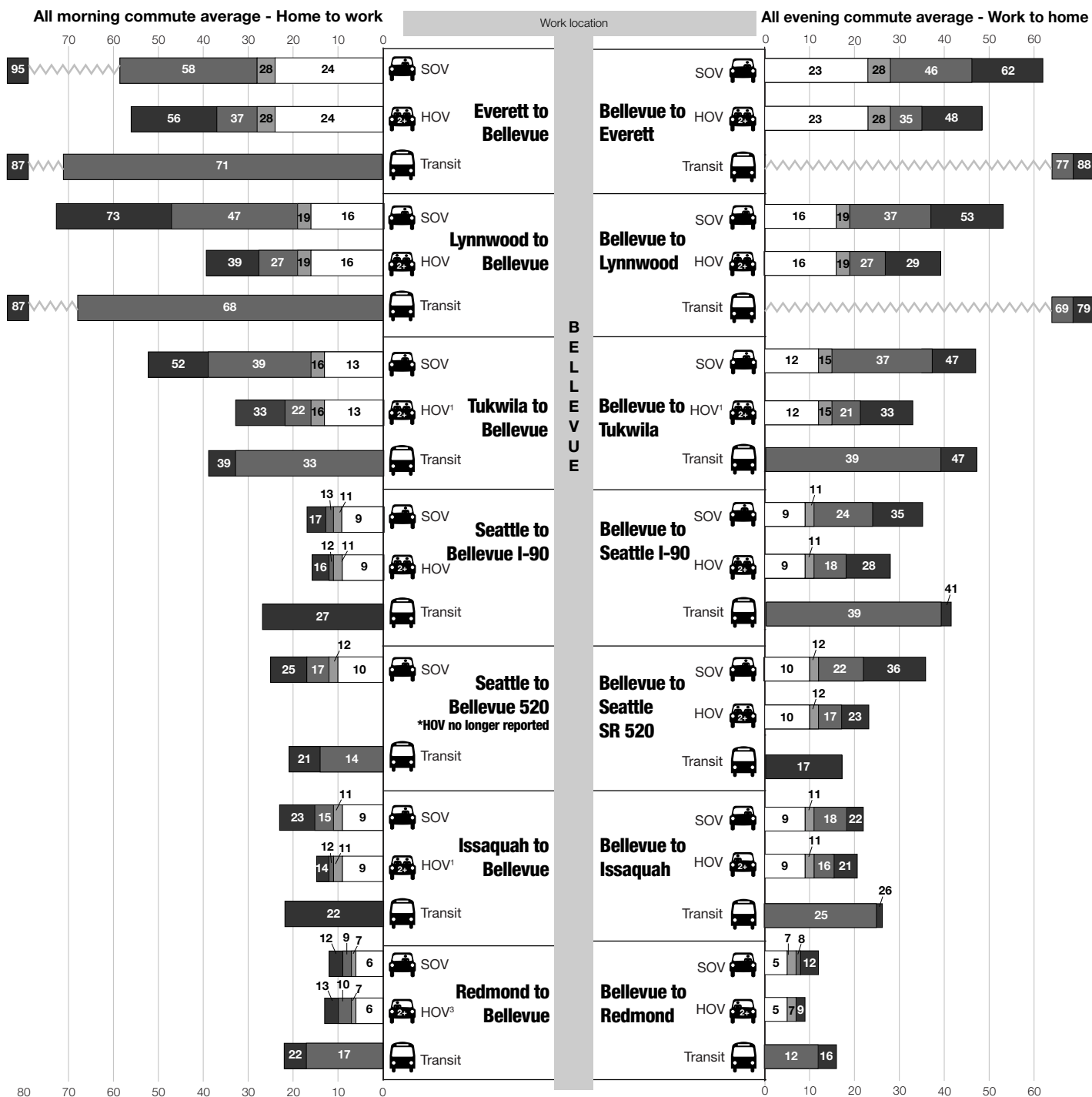
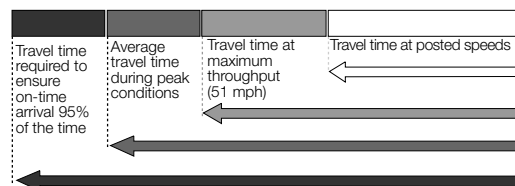
Notes: 1 Average travel times were equal to or faster than maximum throughput travel times on this route. 2 Average travel times and 95th percentile reliable travel times were equal to or faster than maximum throughput travel times on this route. 3 Monday through Friday reversible lane hours of operation: I-5 Southbound - 5:00 p.m.-11:15 a.m.; Northbound - 12:noon-11:00 p.m.; I-90 Westbound - 1:00 a.m.-12:30 p.m.; Eastbound - 2:00 p.m.-12-midnight. 3 Transit travel times include off-highway travel such as exiting to stop at a transit center and may not be directly comparable to private auto times which only include highway travel.

Central Puget Sound Region

HOV, SOV and transit trip analysis – Bellevue

Travel times at posted speeds, maximum throughput speeds, peak travel times, and 95th percentile reliable travel times
 relative travel times commutes by work location

Morning and evening commutes by work location
 2014, Single occupant vehicle (SOV), high occupancy vehicle (HOV) and public transit commutes in the central Puget Sound region; Travel times in minutes



Data sources and analysis: Washington State Transportation Center and WSDOT Office of Strategic Assessment and Performance Analysis.

Notes: 1 Average travel times were equal to or faster than maximum throughput travel times on this route. 2 Average travel times and 95th percentile reliable travel times were equal to or faster than maximum throughput travel times on this route. 3 Transit travel times include off-highway travel such as exiting to stop at a transit center and may not be directly comparable to private auto times which only include highway travel.

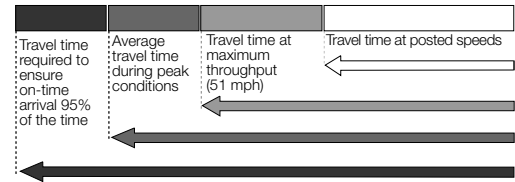
HOV, SOV and transit trip analysis – Other locations

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

Morning and evening commutes by work location

Morning and evening commutes by work location

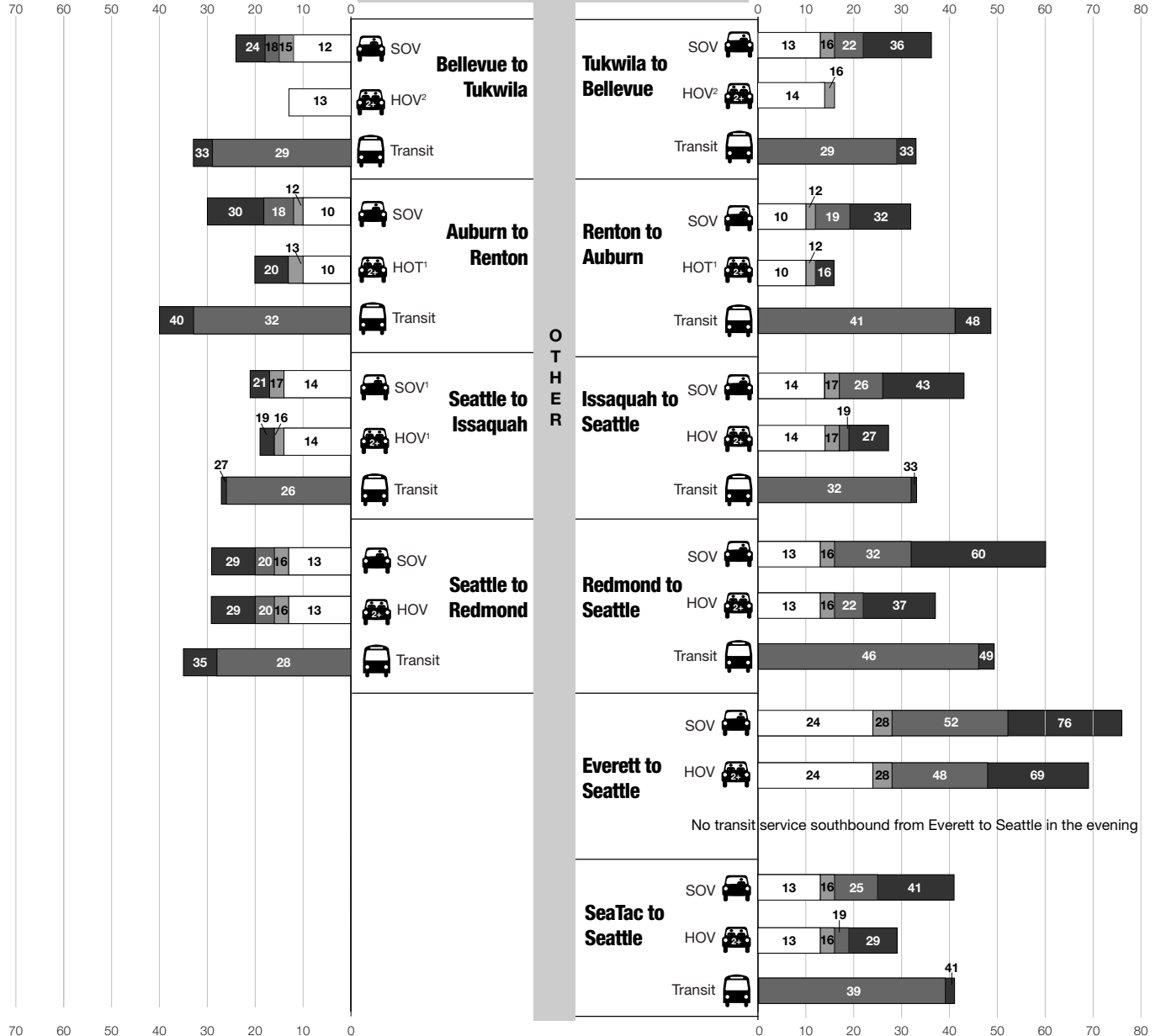
2014 Single occupant vehicle (SOV), high occupancy vehicle (HOV), high occupancy toll (HOT), and public transit commutes in the central Puget Sound area; Travel time in minutes



All morning commute average - Home to work

Work location

All evening commute average - Work to home



Data sources and analysis: Washington State Transportation Center and WSDOT Office of Strategic Assessment and Performance Analysis.

Notes: 1 Average travel times were equal to or faster than maximum throughput travel times on this route. 2 Average travel times and 95th percentile reliable travel times were equal to or faster than maximum throughput travel times on this route. 3 Transit travel times include off-highway travel such as exiting to stop at a transit center and may not be directly comparable to private auto times which only include highway travel.

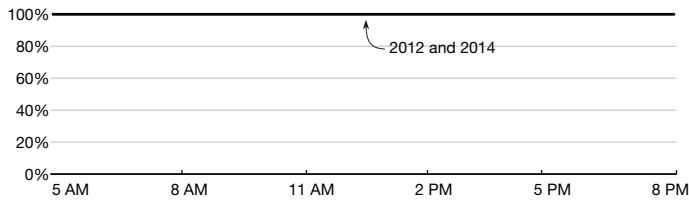
South Puget Sound Region

Throughput productivity

Throughput productivity at select south Puget Sound region freeway locations by commute direction
 2012 and 2014; Based on the highest observed 5-minute (min.) flow rates; Vehicles per hour per lane (vphpl) at specific mileposts (MP)

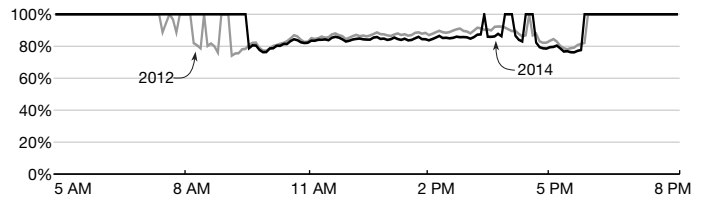
Northbound I-5 in Olympia at 14th Avenue (MP 105.5)

Based on the highest observed 5 min. flow rate of 1,330 vphpl = 100%



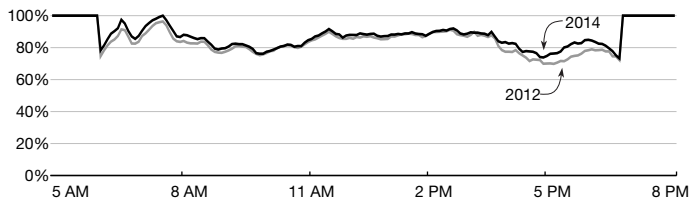
Southbound I-5 in Olympia at 14th Avenue (MP 105.5)

Based on the highest observed 5 min. flow rate of 1,400 vphpl = 100%



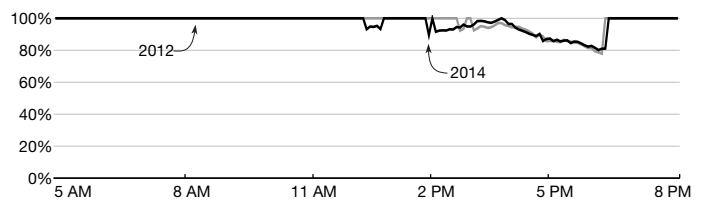
Northbound I-5 at JBLM (MP 122.5)

Based on the highest observed 5 min. flow rate of 1,580 vphpl = 100%



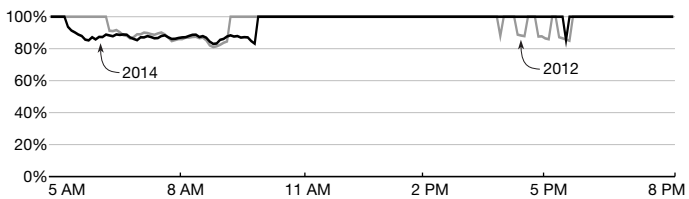
Southbound I-5 at JBLM (MP 122.5)

Based on the highest observed 5 min. flow rate of 1,300 vphpl = 100%



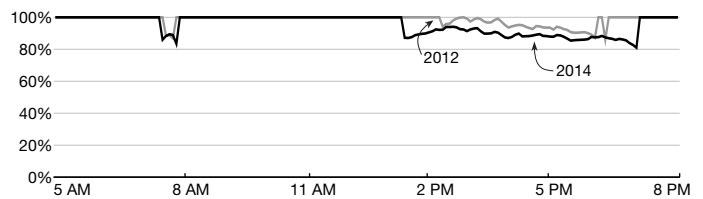
Northbound I-5 at Tacoma Dome (MP 134.5)

Based on the highest observed 5 min. flow rate of 1,640 vphpl = 100%



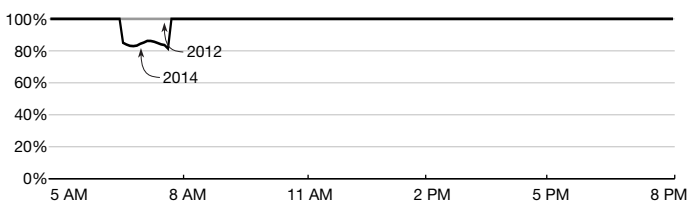
Southbound I-5 at Tacoma Dome (MP 134.5)

Based on the highest observed 5 min. flow rate of 1,350 vphpl = 100%



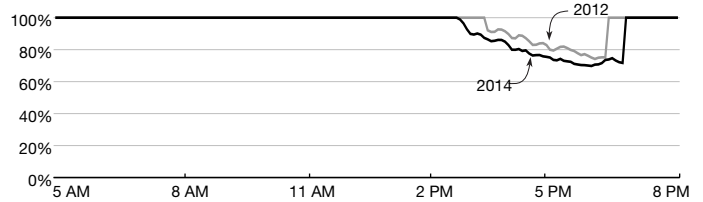
Northbound I-5 at SR 18 (MP 140.5)

Based on the highest observed 5 min. flow rate of 1,550 vphpl = 100%



Southbound I-5 at SR 18 (MP 140.5)

Based on the highest observed 5 min. flow rate of 1,550 vphpl = 100%



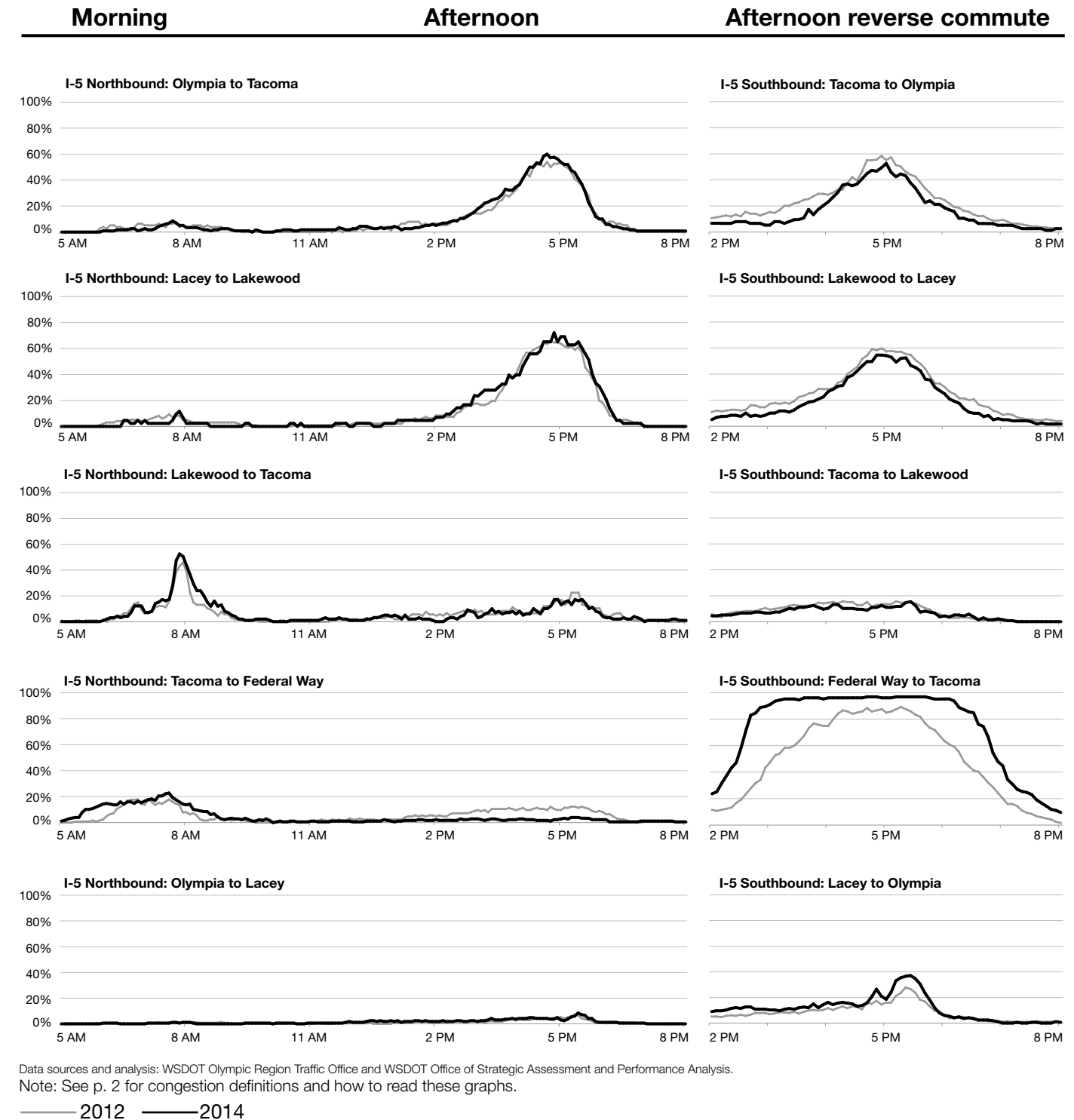
Data sources and analysis: WSDOT Olympic Region Traffic Office, Washington State Transportation Center, and WSDOT Office of Strategic Assessment and Performance Analysis.

Notes: See p. 2 for throughput definitions and how to read these graphs.

Stamp graphs: Frequency, duration of congestion

Stamp graphs of congestion by time of day on south Puget Sound region freeways

2012 and 2014 weekdays; Percent of days the average speed was slower than 45 mph

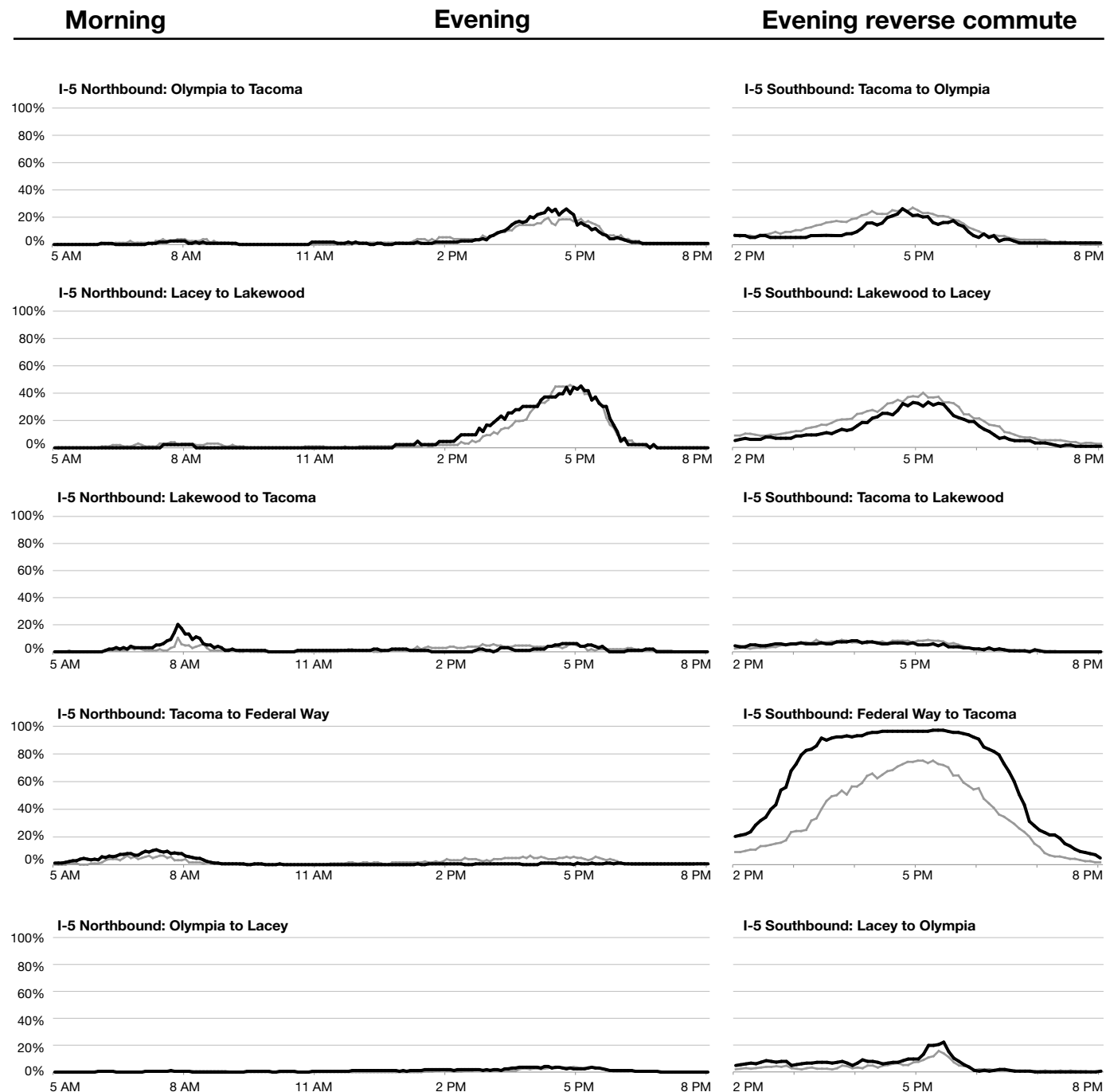


South Puget Sound Region

Stamp graphs: Frequency, duration of SEVERE congestion

Stamp graphs of SEVERE congestion by time of day on south Puget Sound region freeways

2012 and 2014 weekdays; Percent of days the average speed was slower than 36 mph



Data sources and analysis: WSDOT Olympic Region Traffic Office and WSDOT Office of Strategic Assessment and Performance Analysis.

Note: See p. 2 for congestion definitions and how to read these graphs.

— 2012 — 2014

Routinely congested segments

South Puget Sound region routinely congested segments of I-5

2012 weekdays; Length of congestion in miles; Duration of congestion in hours:minutes

Route and direction	Morning peak period				Evening peak period			
	Start and end times	Begin and end milepost	Length of congestion	Duration of congestion	Start and end times	Begin and end milepost	Length of congestion	Duration of congestion
I-5 northbound	7:45-7:55 a.m. ¹	130.5-131	0.5	0:10	3:30-6:10 p.m.	119.5-123.5	4	2:40
	6:40-7:50 a.m.	133.5-135	1.5	1:10	4:00-5:45 p.m.	133.5-134.5	1	1:45
I-5 southbound					3:05-6:15 p.m.	140.5-133	7.5	3:10
					4:15-5:55 p.m.	124-119.5	4.5	1:40

2014 weekdays; Length of congestion in miles; Duration of congestion in hours:minutes

Route and direction	Morning peak period				Evening peak period			
	Start and end times	Begin and end milepost	Length of congestion	Duration of congestion	Start and end times	Begin and end milepost	Length of congestion	Duration of congestion
I-5 northbound	7:45-7:55 a.m. ¹	130.5-131	0.5	0:10	3:25-6:05 p.m.	119-123.5	4.5	2:40
	5:45-7:55 a.m.	134-135	1	2:10				
	6:40-7:00 a.m. ¹	141-141.5	0.5	0:20				
I-5 southbound					2:30-6:55 p.m.	141.5-133	8.5	4:25
					4:10-5:45 p.m.	124-121.5	2.5	1:35
					4:15-5:45 p.m.	120.5-119.5	1	1:30

Data sources and analysis: Washington State Transportation Center and WSDOT Office of Strategic Assessment and Performance Analysis.

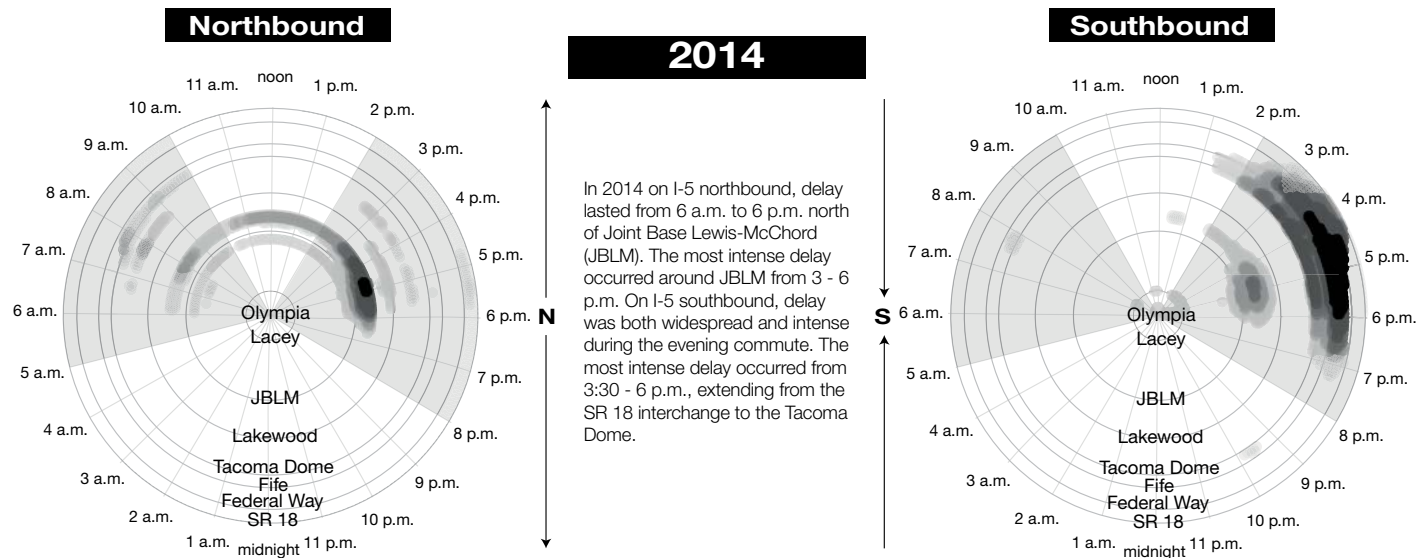
Note: 1 Not reported on routinely congested segments map or narrative in main report due to duration of less than 50 minutes.

South Puget Sound Region

Spiral graphs: Daily vehicle hours of delay on I-5

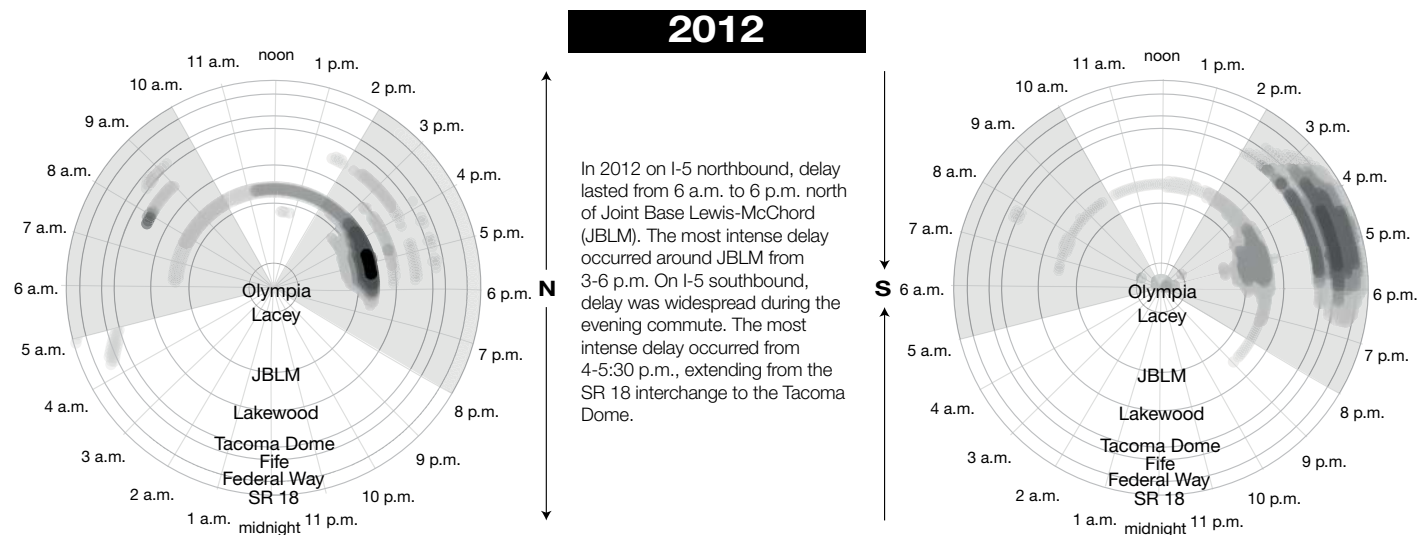
2014 showing more intense evening delay on south Puget Sound region's I-5 corridor

2012 and 2014; Weekdays only; Vehicle hours of delay; Shading represents intensity of delay



From 2012 to 2014, delay on I-5 northbound followed the same pattern, with the most intense delay occurring around JBLM during the evening commute. However, 2014 experienced additional delay south of JBLM that lasted from 6 a.m. to 6 p.m.

From 2012 to 2014, the intensity of delay increased on I-5 southbound from Federal Way to south of the Tacoma Dome. The intense delay lasted one hour longer than in 2012, extending from 2:30-6:30 p.m.



Data sources and analysis: Washington State Transportation Center and WSDOT Office of Strategic Assessment and Performance Analysis.

Note: Spiral graphs are read by commute direction as indicated by the arrows. Northbound is read from the center of the circle to the outer edge; southbound from the outer edge of the circle to the center.

Commute trip analysis

Morning and evening commutes: Changes in travel time performance, congestion, reliability and emissions for 10 morning and evening high-demand commute trips in the south Puget Sound region 2012 and 2014; Morning peak (5-10 a.m.) and evening peak (2-8 p.m.) for an annualized average weekday; 5-minute peak of commuter rush (individual peak times vary); Length of route in miles; All travel times in minutes; Peak of commuter rush and duration of congestion expressed in hours and minutes; Cost of congestion in dollars; Emissions in pounds of carbon dioxide equivalents (CO₂e)

Morning				Travel Times										Congestion						Reliability										Emissions								
Route	Direction of travel	Length of route	Peak time	Travel time at posted speed	Travel time at maximum throughput speed	Average travel time at peak of morning commute			Maximum throughput travel time index (MT ³ I)		Peak period %Δ in VMT	Duration of congestion: How long average speed is below 45 mph			Cost of congestion ¹ per person ² , per trip			2012 percentiles				2014 percentiles				Δ: 2012 vs. 2014				Greenhouse gas emissions ³ in pounds of CO ₂ e								
						2012	2014	%Δ	2012	2014		2012	2014	%Δ	2012	2014	%Δ	Median				Median				Median				Emitted during peak period			Emitted per person ²					
																		50th	80th	90th	95th	50th	80th	90th	95th	50th	80th	90th	95th	2012	2014	%Δ	2012	2014	%Δ			
Northbound																																						
I-5 Olympia to Lacey		NB	6	7:40	6	7	6	6	0%	0.86	0.86	4%	0:00	0:00	0:00	\$0.00	\$0.00	N/A	6	6	6	6	6	6	6	6	0	0	0	0	91,844	91,627	0%	5	5	0%		
I-5 Lacey to Lakewood		NB	16	7:35	16	19	19	19	0%	0.96	0.96	4%	0:00	0:00	0:00	\$0.00	\$0.00	N/A	18	19	21	23	18	19	21	21	0	0	0	-2	299,776	302,783	1%	15	14	-7%		
I-5 Lakewood to Tacoma		NB	4	7:50	4	5	5	5	0%	1.09	1.20	2%	0:00	0:20	0:20	\$0.00	\$0.23	N/A	5	6	6	7	5	6	7	9	0	1	1	2	82,514	81,334	-1%	3	3	0%		
I-5 Tacoma to Federal Way		NB	12	7:25	12	15	15	16	7%	1.01	1.05	5%	0:00	0:00	0:00	\$0.00	\$0.00	N/A	14	16	18	21	14	17	20	27	-1	1	3	6	284,496	276,917	-3%	11	10	-9%		
I-5 Olympia to Tacoma		NB	26	7:25	26	31	29	30	3%	0.95	0.95	4%	0:00	0:00	0:00	\$0.00	\$0.00	N/A	28	30	33	41	29	30	33	35	1	0	0	-6	472,107	472,588	0%	23	22	-4%		
Southbound																																						
I-5 Lacey to Olympia		SB	6	7:45	6	7	6	6	0%	0.92	0.93	5%	0:00	0:00	0:00	\$0.00	\$0.00	N/A	6	7	7	7	6	7	7	7	0	0	0	0	86,760	85,688	-1%	5	5	0%		
I-5 Lakewood to Lacey		SB	17	7:30	17	20	18	17	-6%	0.87	0.85	4%	0:00	0:00	0:00	\$0.00	\$0.00	N/A	18	18	19	19	17	18	18	18	0	0	-1	-1	252,637	250,025	-1%	15	15	0%		
I-5 Tacoma to Lakewood		SB	5	9:50	5	6	6	5	-17%	0.88	0.87	6%	0:00	0:00	0:00	\$0.00	\$0.00	N/A	5	6	6	6	5	5	6	6	0	0	0	0	93,462	95,739	2%	4	4	0%		
I-5 Federal Way to Tacoma		SB	10	7:45	10	12	11	12	9%	0.92	0.96	6%	0:00	0:00	0:00	\$0.00	\$0.00	N/A	11	12	12	13	11	12	13	14	0	0	1	1	187,705	186,313	-1%	9	9	0%		
I-5 Tacoma to Olympia		SB	28	7:25	28	34	29	29	0%	0.88	0.87	4%	0:00	0:00	0:00	\$0.00	\$0.00	N/A	29	30	30	31	29	30	30	30	0	0	0	-1	430,783	429,266	0%	25	24	-4%		

Evening

Northbound																																					
I-5 Olympia to Lacey	NB	6	17:20	6	7	6	6	0%	0.93	0.93	3%	0:00	0:00	0:00	\$0.00	\$0.00	N/A	6	6	6	9	6	6	7	8	0	0	1	-1	128,681	126,607	-2%	5	5	0%		
I-5 Lacey to Lakewood	NB	16	16:45	16	19	27	28	4%	1.38	1.42	3%	2:15	2:40	0:25	\$1.70	\$1.75	3%	26	33	39	45	25	37	40	44	-1	4	1	-1	369,192	366,601	-1%	16	15	-6%		
I-5 Lakewood to Tacoma	NB	4	17:15	4	5	5	5	0%	1.02	1.03	0%	0:00	0:00	0:00	\$0.00	\$0.00	N/A	4	5	6	6	4	5	5	7	0	0	0	1	104,333	100,419	-4%	3	3	0%		
I-5 Tacoma to Federal Way	NB	12	17:20	12	15	14	14	0%	0.96	0.93	3%	0:00	0:00	0:00	\$0.00	\$0.00	N/A	13	14	16	20	14	15	15	16	0	0	-1	-4	301,694	288,054	-5%	11	10	-9%		
I-5 Olympia to Tacoma	NB	26	16:40	26	31	37	37	0%	1.18	1.21	2%	1:30	1:30	-0:00	\$1.46	\$1.61	10%	35	42	49	57	36	44	51	55	1	3	2	-2	601,844	592,943	-1%	24	23	-4%		
Southbound																																					
I-5 Lacey to Olympia	SB	6	17:20	6	7	8	8	0%	1.11	1.15	2%	0:00	0:15	0:15	\$0.00	\$0.30	N/A	7	9	10	13	7	10	11	12	0	1	1	-1	141,123	136,879	-3%	5	5	0%		
I-5 Lakewood to Lacey	SB	17	17:05	17	20	28	27	-4%	1.36	1.31	1%	2:25	1:50	-0:35	\$1.55	\$1.47	-5%	24	36	43	47	23	35	42	49	-1	0	-1	2	415,617	399,200	-4%	16	16	0%		
I-5 Tacoma to Lakewood	SB	5	16:10	5	6	7	7	0%	1.05	1.08	2%	0:00	0:00	0:00	\$0.00	\$0.00	N/A	6	6	7	11	6	6	7	16	0	0	0	5	161,135	166,502	3%	4	4	0%		
I-5 Federal Way to Tacoma	SB	10	17:15	10	12	23	32	39%	1.83	2.62	2%	4:10	5:35	1:25	\$1.96	\$3.53	80%	23	29	31	35	33	37	40	42	10	9	9	7	350,399	368,222	5%	10	10	0%		
I-5 Tacoma to Olympia	SB	28	16:50	28	34	42	41	-2%	1.24	1.21	2%	1:45	1:20	-0:25	\$1.89	\$1.74	-8%	39	49	57	64	37	47	54	63	-3	-2	-3	-1	720,809	700,399	-3%	26	25	-4%		

Data sources and analysis: Wsdot Olympic Region Traffic Office, Puget Sound Regional Council, Washington State Transportation Center, and WSDOT Office of Strategic Assessment and Performance Analysis.

Notes: The symbol “Δ” is used to denote change in a variable. Commute lengths and travel time values have been rounded to integer values for publication only. MT³ Index values cannot be reproduced as published using the integer values in the table. 1 Commute congestion cost based on \$21.90 for every hour of congested conditions measured when commute speeds are slower than 45 mph, applied to the volume of traffic during the congested conditions on an average annual weekday commute. 2 Per-person metrics were estimated based on vehicle occupancy observed on the freeway in the single occupant vehicle lanes. 3 Greenhouse gas emissions were calculated based on emission factors developed by PSRC for different vehicle types at varying travel speeds for each analysis year. In addition, the emissions used the traffic volume and percent of trucks, the average speeds for every 5-minute interval during the peak period, and the average vehicle occupancy on the freeway. 4 Transit performance: Ridership was reported for the peak transit commute periods (6-9 a.m. and 3-6 p.m.). 5 Average load represents utilization of the available transit capacity based on the average maximum load of each bus or train trip and the total seats on the bus or train. Individual trips could show a load greater than 100% if there was standing-room only. Averaging the load for each commute levels out this variation across multiple trips, and may under-represent the load experienced during the peak utilization of transit. 6 Transit travel times include off-highway travel such as exiting to stop at a transit center and may not be directly comparable to private auto times which only include highway travel. 7 Greenhouse gas emissions avoided by transit use were estimated based on the following factors: a) the average maximum transit load; b) the assumption that for every transit passenger mile traveled, 0.62 miles of single-occupant vehicle travel is avoided; c) the distance traveled on the WSDOT-defined commute trip (not the entire transit trip); d) the average emissions of one pound of CO²e for every mile traveled; and e) the emissions from transit vehicle operations provided by the transit agencies.

South Puget Sound Region

Transit commute trip analysis

Morning and evening transit commutes: Changes in transit travel time performance, ridership, and greenhouse gas (GHG) emissions for 10 high-demand commute trips in the south Puget Sound region 2012 and 2014; Morning peak (6-9 a.m.) and evening peak (3-6 p.m.) for an annualized average weekday; 5-minute peak of commuter rush in hours and minutes (individual peak times vary); All travel times in minutes; Emissions in pounds of carbon dioxide equivalents (CO₂e); Average transit ridership, average seats used, and emissions avoided based on the average maximum load during the peak period

Morning				Travel Times												Ridership												Emissions														
Route	Direction of travel	Length of route	Peak time	Travel times in minutes at peak of morning/evening commute¹																																						
				Auto 95% reliable			Transit average			Transit 95% reliable			Ridership²			Passenger miles traveled			Lane capacity savings³			Average percent of seats used⁴			Number of trips			Percent of trips over 90% capacity			Daily emissions avoided due to transit use⁵			Vehicle miles traveled avoided due to transit use								
				2012	2014	Δ	2012	2014	Δ	2012	2014	Δ	2012	2014	%Δ	2012	2014	%Δ	2012	2014	%Δ	2012	2014	%Δ	2012	2014	%Δ	2012	2014	%Δ	2012	2014	%Δ	2012	2014	%Δ						
Northbound																																										
I-5 Olympia to Lacey	NB	6	7:40	6	6	0	18	8	-10	19	8	-11	57	58	1%	332	335	1%	0.01	0.01	1%	38%	22%	-16%	4	7	75%	0%	0%	0%	155	122	-21%	206	208	1%						
I-5 Lacey to Lakewood	NB	16	7:35	23	21	-2	20	21	1	22	21	-1	143	155	8%	2,096	2,260	8%	0.03	0.03	8%	37%	29%	-8%	10	14	40%	10%	0%	-10%	922	901	-2%	1,300	1,401	8%						
I-5 Lakewood to Tacoma	NB	4	7:50	7	9	2	14	15	1	18	18	0	229	233	2%	1,238	1,259	2%	0.04	0.04	2%	38%	37%	-1%	14	13	-7%	7%	0%	-7%	526	559	6%	767	780	2%						
I-5 Tacoma to Federal Way⁶	NB	12	7:25	21	27	6	16	16	0	18	18	0	3,946	4,635	17%	42,682	50,159	18%	0.74	0.87	17%	55%	59%	4%	76	76	0%	0%	3%	3%	22,646	27,265	20%	26,463	31,099	18%						
I-5 Olympia to Tacoma	NB	26	7:25	41	35	-6	56	36	-20	62	43	-19	301	282	-6%	5,314	4,806	-10%	0.06	0.05	-6%	36%	29%	-7%	20	22	10%	5%	0%	-5%	2,417	1,976	-18%	3,294	2,980	-10%						
Southbound																																										
I-5 Lacey to Olympia	SB	6	7:45	7	7	0	13	14	1	13	16	3	76	109	44%	438	632	44%	0.01	0.02	44%	40%	23%	-17%	5	12	140%	0%	0%	0%	207	223	8%	271	392	44%						
I-5 Lakewood to Lacey	SB	17	7:30	19	18	-1	18	25	7	22	25	3	106	132	24%	1,773	2,196	24%	0.02	0.02	24%	30%	27%	-4%	9	13	44%	0%	0%	0%	762	897	18%	1,099	1,362	24%						
I-5 Tacoma to Lakewood	SB	5	9:50	6	6	0	13	13	0	13	15	2	118	123	4%	615	641	4%	0.02	0.02	4%	16%	16%	-1%	16	16	0%	0%	0%	0%	106	120	13%	381	397	4%						
I-5 Federal Way to Tacoma⁶	SB	10	7:45	13	14	1	15	15	0	15	16	1	489	535	9%	5,057	5,531	9%	0.09	0.10	9%	20%	20%	0%	21	24	14%	0%	0%	0%	2,072	2,239	8%	3,136	3,430	9%						
I-5 Tacoma to Olympia	SB	28	7:25	31	30	-1	50	64	14	52	67	15	170	214	25%	3,409	3,967	16%	0.03	0.04	25%	20%	20%	0%	19	23	21%	0%	0%	0%	1,324	1,491	13%	2,114	2,459	16%						

Evening

Northbound ⁸																																				
I-5 Olympia to Lacey	NB	6	17:20	9	8	-1	13	15	2	24	16	-8	128	102	-20%	740	593	-20%	0.02	0.02	-20%	56%	27%	-29%	6	10	67%	0%	0%	0%	382	245	-36%	459	368	-20%
I-5 Lacey to Lakewood	NB	16	16:45	45	44	-1	25	32	7	25	32	7	147	119	-19%	2,338	1,927	-18%	0.03	0.02	-19%	39%	28%	-10%	9	11	22%	0%	0%	0%	1,112	815	-27%	1,450	1,195	-18%
I-5 Lakewood to Tacoma	NB	4	17:15	6	7	1	15	28	13	16	28	12	254	212	-17%	1,374	1,146	-17%	0.05	0.04	-17%	28%	23%	-6%	19	20	5%	0%	0%	0%	491	342	-30%	852	710	-17%
I-5 Tacoma to Federal Way ⁶	NB	12	17:20	20	16	-4	17	17	0	20	19	-1	716	628	-12%	7,626	6,712	-12%	0.13	0.12	-12%	27%	25%	-3%	24	24	0%	0%	0%	0%	3,489	2,984	-14%	4,728	4,161	-12%
I-5 Olympia to Tacoma	NB	26	16:40	57	55	-2	76	49	-27	93	60	-33	299	258	-14%	5,192	4,642	-11%	0.06	0.05	-14%	28%	22%	-5%	23	26	13%	0%	0%	0%	2,261	1,763	-22%	3,219	2,878	-11%
Southbound ⁸																																				
I-5 Lacey to Olympia	SB	6	17:20	13	12	-1	21	21	0	19	23	4	45	56	26%	251	319	27%	0.01	0.01	26%	59%	25%	-34%	2	6	200%	0%	0%	0%	131	125	-5%	156	198	27%
I-5 Lakewood to Lacey	SB	17	17:05	47	49	2	22	35	13	29	49	20	183	257	40%	2,545	3,281	29%	0.03	0.05	40%	60%	38%	-21%	7	17	143%	14%	0%	-14%	1,309	1,436	10%	1,578	2,034	29%
I-5 Tacoma to Lakewood	SB	5	16:10	11	16	5	18	19	1	20	24	4	214	228	7%	1,115	1,189	7%	0.04	0.04	7%	27%	33%	6%	17	15	-12%	0%	0%	0%	378	474	25%	691	737	7%
I-5 Federal Way to Tacoma ⁶	SB	10	17:15	35	42	7	20	26	6	30	35	5	3,760	4,866	29%	38,879	50,307	29%	0.70	0.91	29%	56%	57%	1%	50	73	46%	6%	3%	-3%	21,362	27,496	29%	24,105	31,191	29%
I-5 Tacoma to Olympia	SB	28	16:50	64	63	-1	79	84	5	94	102	8	339	434	28%	5,157	6,059	17%	0.06	0.08	28%	35%	35%	0%	21	29	38%	5%	0%	-5%	2,394	2,561	7%	3,197	3,757	17%

Data sources and analysis: Intercity Transit, Pierce Transit, Sound Transit, WSDOT Olympic Region Traffic Office, Washington State Transportation Center, and WSDOT Office of Strategic Assessment and Performance Analysis.

Notes: The symbol “Δ” is used to denote change in a variable. 1 Transit travel times include off-highway travel such as exiting to stop at a transit center and may not be directly comparable to private auto times which only include highway travel. 2 Ridership was reported for the peak transit commute periods (6-9 a.m. and 3-6 p.m.). 3 Lane capacity savings is a measure of how many general purpose lanes’ worth of capacity transit ridership provides during the peak periods. See the addendum to WSDOT’s methodology document at [www.wsdot.wa.gov/CCR15_methodology_addendum.pdf](#) for more calculation methods. 4 Average percent of seats used is based on the average maximum load of each bus or train trip and the total seats on the bus or train. Individual trips could show a load greater than 100% if there was standing-room only. Averaging the load for each commute levels out this variation across multiple trips, and may under-represent the load experienced during the peak utilization of transit. 5 Greenhouse gas emissions avoided by transit use were estimated based on the following factors: a) the average maximum transit load; b) the assumption that for every transit passenger mile traveled, 0.62 miles of single-occupant vehicle travel is avoided; c) the distance traveled on the WSDOT-defined commute trip (not the entire transit trip); d) the average emissions of one pound of CO₂e for every mile traveled; and e) the emissions from transit vehicle operations provided by the transit agencies. 6 Transit services include buses and Sounder commuter trains.

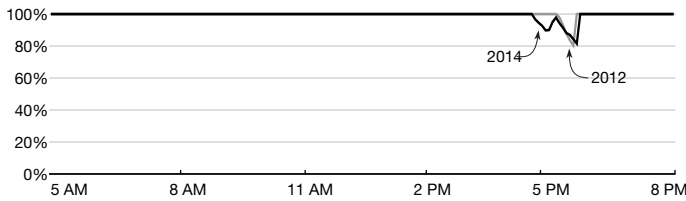
Throughput productivity and stamp graphs

Throughput productivity at select Spokane region freeway locations by commute direction

2012 and 2014; Based on the highest observed 5-minute (min.) flow rates; Vehicles per hour per lane (vphpl) at specific mileposts (MP)

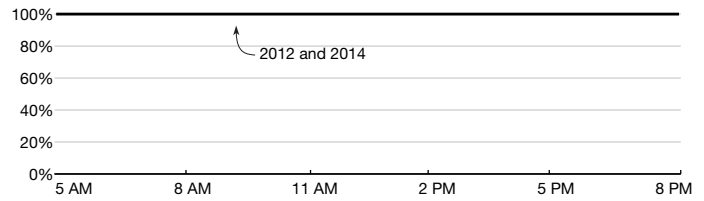
Eastbound I-90 near Freya Street (MP 283.79)

Based on the highest observed 5 min. flow rate of 1,690 vphpl = 100%



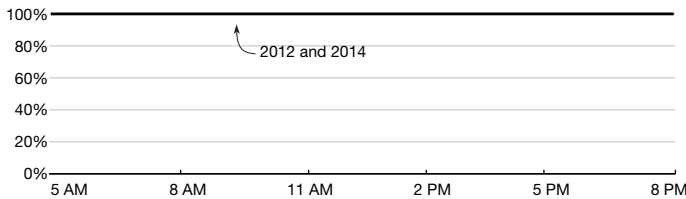
Westbound I-90 near Freya Street (MP 283.79)

Based on the highest observed 5 min. flow rate of 1,560 vphpl = 100%



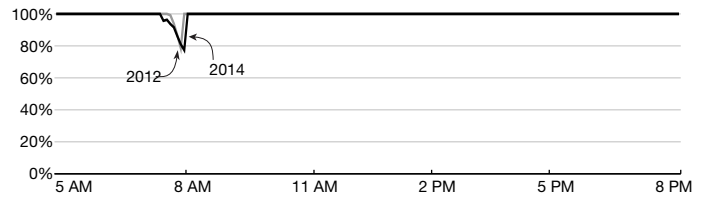
Eastbound I-90 near Custer Road (MP 284.59)

Based on the highest observed 5 min. flow rate of 1,980 vphpl = 100%



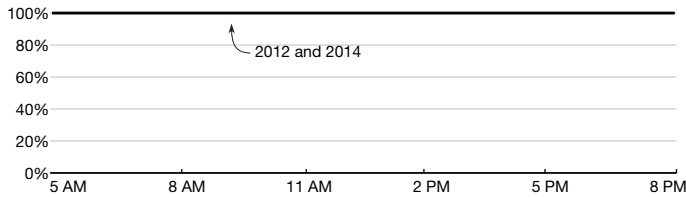
Westbound I-90 near Custer Road (MP 284.59)

Based on the highest observed 5 min. flow rate of 1,960 vphpl = 100%



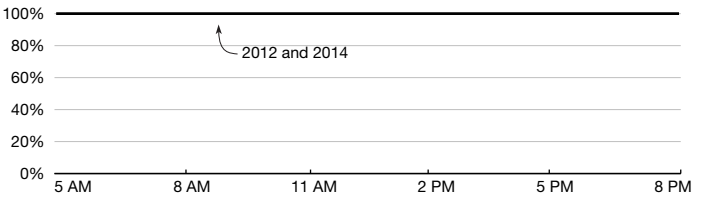
Eastbound I-90 near Broadway Avenue (MP 286.19)

Based on the highest observed 5 min. flow rate of 1,640 vphpl = 100%



Westbound I-90 near Broadway Avenue (MP 286.19)

Based on the highest observed 5 min. flow rate of 1,690 vphpl = 100%



Data sources and analysis: WSDOT Eastern Region Planning Office and WSDOT Office of Strategic Assessment and Performance Analysis.

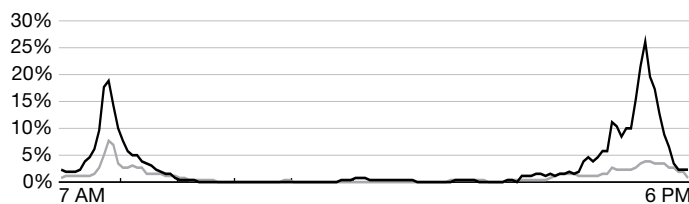
Notes: See p. 2 for throughput definitions and how to read these graphs. Data from the Fancher Road station was no longer reliable, and has been replaced in this year's report with data from the Broadway Avenue station.

Stamp graphs of congestion by time of day on Spokane region freeways

2012 and 2014 weekdays; Percent of days the average speed was slower than 45 mph

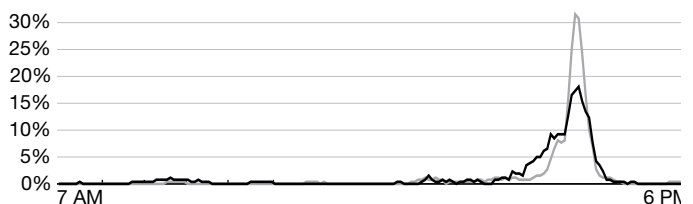
I-90 Westbound: Division Street to Argonne Road percent of days with congested conditions

2012 and 2014 weekdays



I-90 Eastbound: Argonne Road to Division Street percent of days with congested conditions

2012 and 2014 weekdays



Data sources and analysis: WSDOT Eastern Region Traffic Office and WSDOT Office of Strategic Assessment and Performance Analysis.

Notes: Severe congestion (average speeds slower than 36 mph) was observed for no more than 5.4% of weekdays at all times of day in 2012, and no more than 5.0% in 2014. See p. 2 for congestion definitions and how to read these graphs.

— 2012 — 2014

Spokane Region

Routinely congested segments

Spokane region routinely congested segments of I-90¹

2012 weekdays; Length of congestion in miles; Duration of congestion in hours:minutes

Route and direction	Morning peak period				Evening peak period			
	Start and end times	Begin and end milepost	Length of congestion	Duration of congestion	Start and end times	Begin and end milepost	Length of congestion	Duration of congestion
I-90 westbound	7:45-8:00 a.m.	284.6-284.1	0.5	0:15				
I-90 eastbound					5:15-5:35 p.m.	283.3-283.8	0.5	0:20

2014 weekdays; Length of congestion in miles; Duration of congestion in hours:minutes

Route and direction	Morning peak period				Evening peak period			
	Start and end times	Begin and end milepost	Length of congestion	Duration of congestion	Start and end times	Begin and end milepost	Length of congestion	Duration of congestion
I-90 westbound	7:40-8:00 a.m.	283.8-284.8	1	0:20				
I-90 eastbound					4:50-4:55 p.m.	282.8-283.8	1	0:35
					5:10-5:40 p.m.			
					5:15-5:30 p.m.	280.8-281.3	0.5	0:15

Data sources and analysis: WSDOT Eastern Region Traffic Office and WSDOT Office of Strategic Assessment and Performance Analysis.

Notes: 1 Not reported on routinely congested segments map or narrative in main report due to duration of less than 50 minutes.

Morning and evening commutes: Changes in travel time performance, congestion, reliability and emissions for four high-demand commute trips in the Spokane region
2012 and 2014; Morning peak (7-10 a.m.) and evening peak (3-6 p.m.) for an annualized average weekday; 5-minute peak of commuter rush (individual peak times vary); Length of route in miles; All travel times in minutes; Peak of commuter rush and duration of congestion expressed in hours and minutes; Cost of congestion in dollars; Emissions in pounds of carbon dioxide equivalents (CO₂e)

Morning				Travel Times									Congestion				Reliability												Emissions						
Route	Direction of travel	Length of route	Peak time	Travel time at posted speed	Travel time at maximum throughput speed	Average travel time at peak of morning commute			Maximum throughput travel time index (MT ³ I)		Peak period %Δ in VMT	Duration of congestion How long average speed is below 45 mph			Cost of Congestion ¹ per person ² , per trip			2012 percentiles				2014 percentiles				Δ: 2012 vs. 2014				Greenhouse gas emissions ³ in pounds of CO ₂ e					
						2012	2014	%Δ	2012	2014		2012	2014	Δ	2012	2014	%Δ	Median				Median				Median				Emitted during peak period			Emitted per person ²		
																		50th	80th	90th	95th	50th	80th	90th	95th	50th	80th	90th	95th	2012	2014	%Δ	2012	2014	%Δ
I-90 Argonne Road to Division Street	WB	7.5	7:50	8	9	9	9	0%	0.95	1.01	6%	0:00	0:00	0:00	\$0.00	\$0.00	N/A	8	9	10	10	9	10	11	12	1	1	1	2	76,856	70,707	-8%	6.9	6.0	-13%
I-90 Division Street to Argonne Road	EB	7.5	9:05	8	9	7	8	14%	0.82	0.85	-1%	0:00	0:00	0:00	\$0.00	\$0.00	N/A	8	8	8	8	8	8	8	8	0	0	0	0	64,783	55,673	-14%	6.8	5.9	-13%

Evening

I-90 Argonne Road to Division Street	WB	7.5	17:15	8	9	8	9	13%	0.89	0.98	6%	0:00	0:00	0:00	\$0.00	\$0.00	N/A	8	8	8	9	8	10	11	11	0	2	3	2	79,376	73,617	-7%	6.8	6.0	-12%
I-90 Division Street to Argonne Road	EB	7.5	17:20	8	9	7	9	29%	0.81	1.00	-5%	0:00	0:00	0:00	\$0.00	\$0.00	N/A	8	8	8	9	9	10	10	11	1	2	2	2	98,490	82,624	-16%	6.8	6.0	-12%

Data sources and analysis: WSDOT Eastern Region Traffic Office and WSDOT Office of Strategic Assessment and Performance Analysis.
Notes: The symbol “Δ” is used to denote change in a variable. Commute lengths and travel time values have been rounded to integer values for publication only. MT³ Index values cannot be reproduced as published using the integer values in the table. 1 Commute congestion cost based on \$21.90 for every hour of congested conditions measured when commute speeds are slower than 45 mph, applied to the volume of traffic during the congested conditions on an average annual weekday commute. 2 Per-person metrics were estimated based on vehicle occupancy observed on the freeway in the single occupant vehicle lanes. 3 Greenhouse gas emissions were calculated based on emission factors developed by PSRC for different vehicle types at varying travel speeds for each analysis year. In addition, the emissions used the traffic volume and percent of trucks, the average speeds for every 5-minute interval during the peak period, and the average vehicle occupancy on the freeway.

Morning and evening transit commutes: Changes in transit travel time performance, ridership, and greenhouse gas (GHG) emissions for two high-demand commute trips in the Spokane region
2012 and 2014; Morning peak (6-9 a.m.) and evening peak (3-6 p.m.) for an annualized average weekday; 5-minute peak of commuter rush in hours and minutes (individual peak times vary); All travel times in minutes; Emissions in pounds of carbon dioxide equivalents (CO₂e); Average transit ridership, average seats used, and emissions avoided based on the average maximum load during the peak period

Morning				Travel Times										Ridership										Emissions															
Route	Direction of travel	Length of route	Peak time	Travel times in minutes at peak of morning/evening commute ¹																		Lane capacity savings ³			Average percent of seats used ⁴			Number of trips			Percent of trips over 90% capacity			Daily emissions avoided due to transit use ⁵			Vehicle miles traveled avoided due to transit use		
				Auto 95% reliable			Transit planned			Transit 95% reliable			Ridership ²			Passenger miles traveled			2012	2014	%Δ	2012	2014	%Δ	2012	2014	%Δ	2012	2014	%Δ	2012	2014	%Δ	2012	2014	%Δ			
				2012	2014	Δ	2012	2014	Δ	2012	2014	Δ	2012	2014	%Δ	2012	2014	%Δ																					
I-90 Argonne Road to Division Street	WB	7.5	7:50	10	12	2	0:15	0:15	0	N/A	N/A	N/A	598	614	3%	4,096	4,211	3%	0.10	0.11	3%	57%	58%	1%	23	22	-4%	4%	0%	-4%	1,829	1,910	4%	2,540	2,611	3%			

Evening

I-90 Division Street to Argonne Road	EB	7.5	17:20	9	11	2	0:24	0:24	0	N/A	N/A	N/A	468	458	-2%	3,276	3,206	-2%	0.08	0.08	-2%	71%	57%	-13%	17	17	0%	12%	0%	-12%	1,548	1,448	-6%	2,031	1,988	-2%
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Data sources and analysis: Spokane Transit Authority, WSDOT Eastern Region Traffic Office, and WSDOT Office of Strategic Assessment and Performance Analysis.
Notes: The symbol “Δ” is used to denote change in a variable. 1 Transit travel times include off-highway travel such as exiting to stop at a transit center and may not be directly comparable to private auto times which only include highway travel. 2 Ridership was reported for the peak transit commute periods (6-9 a.m. and 3-6 p.m.). 3 Lane capacity savings is a measure of how many general purpose lanes' worth of capacity transit ridership provides during the peak periods. See the addendum to WSDOT's methodology document at www.wsdot.wa.gov/CCR15_methodology_addendum.pdf for more calculation methods. 4 Average percent of seats used is based on the average maximum load of each bus or train trip and the total seats on the bus or train. Individual trips could show a load greater than 100% if there was standing-room only. Averaging the load for each commute levels out this variation across multiple trips, and may under-represent the load experienced during the peak utilization of transit. 5 Greenhouse gas emissions avoided by transit use were estimated based on the following factors: a) the average maximum transit load; b) the assumption that for every transit passenger mile traveled, 0.62 miles of single-occupant vehicle travel is avoided; c) the distance traveled on the WSDOT-defined commute trip (not the entire transit trip); d) the average emissions of one pound of CO₂e for every mile traveled; and e) the emissions from transit vehicle operations provided by the transit agencies.

Morning and evening commutes: Changes in travel time performance, congestion, reliability, emissions and transit performance for eight high-demand commute trips in the Vancouver region
2012 and 2014; Morning peak (6-9 a.m.) and evening peak (3-6 p.m.) for an annualized average weekday; 5-minute peak of commuter rush (individual peak times vary); Length of route in miles; All travel times in minutes; Peak of commuter rush and duration of congestion expressed in hours and minutes; Cost of congestion in dollars; Emissions in pounds of carbon dioxide equivalents (CO₂e); Average transit ridership, average load, and emissions avoided based on the average maximum load during the peak period

Morning				Travel Times								Congestion					Reliability										Emissions									
Route	Direction of travel	Length of route	Peak time	Travel time at posted speed	Travel time at maximum throughput speed	Average travel time at peak of morning commute			Maximum throughput travel time index (MT ¹ I)		Peak period %Δ in VMT	Duration of congestion How long average speed is below 45 mph			Cost of Congestion ¹ Per person ² , per trip			2012 percentiles				2014 percentiles				Δ: 2012 vs. 2014				Greenhouse gas emissions ³ in pounds of CO ₂ e						
						2012	2014	%Δ	2012	2014		Δ	2012	2014	%Δ	Median				Median				Median				Emitted during peak period			Emitted per person ²					
																50th	80th	90th	95th	50th	80th	90th	95th	50th	80th	90th	95th	2012	2014	%Δ	2012	2014	%Δ			
Southbound: To Portland Oregon (Washington state line)																																				
I-5 (I-205 interchange to I-5 bridge [Oregon])	SB	8	6:45	8	9	15	18	20%	1.68	1.97	4%	1:30	1:55	0:25	\$1.45	\$2.15	48%	13	19	23	27	16	24	27	31	3	5	3	4	85,530	87,628	2%	6	6	0%	
I-5 (SR 500 interchange to I-5 bridge [Oregon])	SB	2	6:40	2	2	8	8	0%	3.14	3.43	0%	5:20	4:40	-0:40	\$0.60	\$0.82	37%	7	10	12	13	8	10	11	12	1	1	-1	-1	37,207	33,516	-10%	7	6	-14%	
I-205 (I-5 interchange to Glenn Jackson Bridge [Oregon])	SB	10	7:40	10	12	12	14	17%	1.01	1.14	3%	0:00	0:00	0:00	\$0.00	\$0.00	N/A	10	12	13	15	11	16	21	26	1	5	7	11	90,279	82,705	-8%	9	6	-33%	
I-205 (SR 500 interchange to Glenn Jackson Bridge [Oregon])	SB	4	7:35	4	5	5	6	20%	1.10	1.21	3%	0:00	0:00	0:00	\$0.00	\$0.00	N/A	4	5	5	6	4	7	9	9	0	2	3	3	69,563	62,306	-10%	9	8	-11%	

Evening

Northbound: From Portland, Oregon (Washington state line)																																			
I-5 (I-5 bridge [Oregon] to I-205 interchange)	NB	8	17:15	8	9	8	8	0%	0.88	0.90	5%	0:00	0:00	0:00	\$0.00	\$0.00	N/A	8	8	8	9	8	8	9	9	0	0	0	0	82,975	86,611	4%	5	5	0%
I-5 (I-5 bridge [Oregon] to SR 500 interchange)	NB	2	17:45	2	2	2	2	0%	1.00	1.03	3%	0:00	0:00	0:00	\$0.00	\$0.00	N/A	2	2	2	3	2	2	2	3	0	0	0	0	23,436	26,191	12%	4	4	0%
I-205 (Glenn Jackson Bridge [Oregon] to I-5 interchange)	NB	10	17:30	10	12	12	12	0%	1.00	1.03	2%	0:00	0:00	0:00	\$0.00	\$0.00	N/A	11	12	14	17	11	14	12	18	1	1	-2	1	92,095	90,516	-2%	9	6	-33%
I-205 (Glenn Jackson Bridge [Oregon] to SR 500 interchange)	NB	4	17:30	4	5	5	6	20%	1.10	1.16	2%	0:00	0:00	0:00	\$0.00	\$0.00	N/A	4	5	5	8	5	6	8	9	0	1	3	1	74,708	65,252	-13%	8	7	-13%

Data sources and analysis: National Performance Management Research Data Set, WSDOT Southwest Region Traffic Office, and WSDOT Office of Strategic Assessment and Performance Analysis.
Notes: The symbol “Δ” is used to denote change in a variable. Commute lengths and travel time values have been rounded to integer values for publication only. MT³ Index values cannot be reproduced as published using the integer values in the table. 1 Commute congestion cost based on \$21.90 for every hour of congested conditions measured when commute speeds are slower than 45 mph, applied to the volume of traffic during the congested conditions on an average annual weekday commute. 2 Per-person metrics were estimated based on vehicle occupancy observed on the freeway in the single occupant vehicle lanes. 3 Greenhouse gas emissions were calculated based on emission factors developed by the PSRC for different vehicle types at varying travel speeds for each analysis year. In addition, the emissions used the traffic volume and percent of trucks, the average speeds for every 5-minute interval during the peak period, and the average vehicle occupancy on the freeway.

Morning and evening transit commutes: Changes in transit travel time performance, ridership, and greenhouse gas (GHG) emissions for six high-demand commute trips in the Vancouver region
2012 and 2014; Morning peak (6-9 a.m.) and evening peak (3-6 p.m.) for an annualized average weekday; 5-minute peak of commuter rush in hours and minutes (individual peak times vary); All travel times in minutes; Emissions in pounds of carbon dioxide equivalents (CO₂e); Average transit ridership, average seats used, and emissions avoided based on the average maximum load during the peak period

Morning				Travel Times										Ridership										Emissions												
Route	Direction of travel	Length of route	Peak time	Travel times in minutes at peak of morning/evening commute¹												Passenger miles traveled			Lane capacity savings³			Average percent of seats used⁴			Number of trips			Percent of trips over 90% capacity			Daily emissions avoided due to transit use⁵			Vehicle miles traveled avoided due to transit use		
				Auto 95% reliable			Transit planned			Transit 95% reliable			Ridership²																							
				2012	2014	Δ	2012	2014	Δ	2012	2014	Δ	2012	2014	%Δ	2012	2014	%Δ	2012	2014	%Δ	2012	2014	%Δ	2012	2014	%Δ	2012	2014	%Δ	2012	2014	%Δ			
Southbound: To Portland Oregon (Washington state line)																																				
I-5 (I-205 interchange to I-5 bridge [Oregon])	SB	8	6:45	27	31	4	14	13	-1	N/A	N/A	N/A	650	633	-3%	3,767	3,658	-3%	0.11	0.11	-3%	51%	53%	2%	33	31	-6%	3%	0%	-3%	1,545	1,540	0%	2,335	2,268	-3%
I-5 (SR 500 interchange to I-5 bridge [Oregon])	SB	2	6:40	13	12	-1	N/A	N/A	N/A	N/A	N/A	N/A	126	130	3%	252	260	3%	0.02	0.02	3%	61%	60%	0%	5	5	0%	0%	0%	0%	115	120	4%	156	161	3%
I-205 (SR 500 interchange to Glenn Jackson Bridge [Oregon])	SB	4	7:35	6	9	3	N/A	N/A	N/A	N/A	N/A	N/A	469	496	6%	238	250	5%	0.08	0.09	6%	61%	64%	3%	18	18	0%	0%	0%	0%	105	113	8%	147	155	5%

Evening

Northbound: From Portland, Oregon (Washington state line)																																							
I-5 (I-5 bridge [Oregon] to I-205 interchange)	NB	8	17:15	9	9	0	23	14	4	N/A	N/A	N/A	547	608	11%	3,144	3,598	14%	0.09	0.10	11%	45%	52%	7%	31	30	-3%	0%	0%	0%	1,210	1,504	24%	1,949	2,231	14%			
I-5 (I-5 bridge [Oregon] to SR 500 interchange)	NB	2	17:45	3	3	0	N/A	N/A	N/A	N/A	N/A	N/A	479	553	15%	310	351	13%	0.08	0.09	15%	52%	57%	5%	22	23	5%	0%	0%	0%	137	155	12%	192	218	13%			
I-205 (Glenn Jackson Bridge [Oregon] to SR 500 interchange)	NB	4	17:30	8	9	1	N/A	N/A	N/A	N/A	N/A	N/A	42	48	14%	13	14	14%	0.01	0.01	14%	37%	37%	1%	3	3	0%	0%	0%	0%	4	5	27%	8	9	14%			

Data sources and analysis: C-TRAN, National Performance Management Research Data Set, WSDOT Southwest Region Traffic Office, and WSDOT Office of Strategic Assessment and Performance Analysis.
Notes: The symbol “Δ” is used to denote change in a variable. Routes without travel times did not have timepoints for accurate travel times to be collected. 1 Transit travel times include off-highway travel such as exiting to stop at a transit center and may not be directly comparable to private auto times which only include highway travel. 2 Ridership was reported for the peak transit commute periods (6-9 a.m. and 3-6 p.m.). 3 Lane capacity savings is a measure of how many general purpose lanes’ worth of capacity transit ridership provides during the peak periods. See the addendum to WSDOT’s methodology document at www.wsdot.wa.gov/CCR15_methodology_addendum.pdf for more calculation methods. 4 Average percent of seats used is based on the average maximum load of each bus or train trip and the total seats on the bus or train. Individual trips could show a load greater than 100% if there was standing-room only. Averaging the load for each commute levels out this variation across multiple trips, and may under-represent the load experienced during the peak utilization of transit. 5 Greenhouse gas emissions avoided by transit use were estimated based on the following factors: a) the average maximum transit load; b) the assumption that for every transit passenger mile traveled, 0.62 miles of single-occupant vehicle travel is avoided; c) the distance traveled on the WSDOT-defined commute trip (not the entire transit trip); d) the average emissions of one pound of CO₂e for every mile traveled; and e) the emissions from transit vehicle operations provided by the transit agencies.

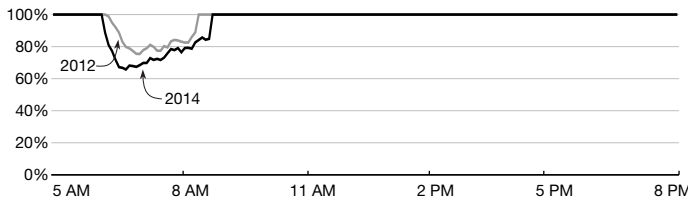
Throughput productivity and stamp graphs

Throughput productivity at select Vancouver region freeway locations by commute direction

2012 and 2014; Based on the highest observed 5-minute (min.) flow rates; Vehicles per hour per lane (vphpl) at specific mileposts (MP)

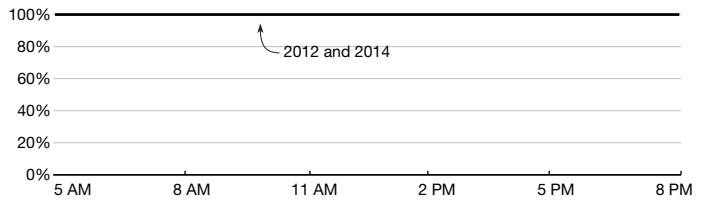
Southbound I-5 near Fourth Plain Boulevard (MP 1.41)

Based on the highest observed 5 min. flow rate of 1,430 vphpl = 100%



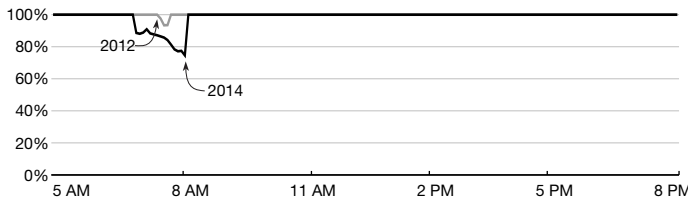
Northbound I-5 near Fourth Plain Boulevard (MP 1.41)

Based on the highest observed 5 min. flow rate of 1,940 vphpl = 100%



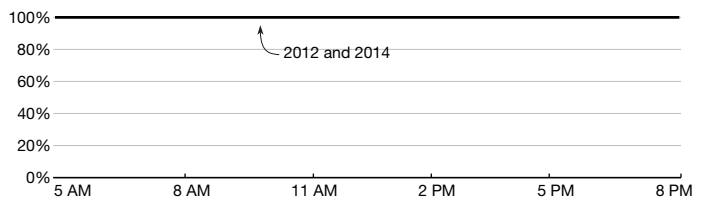
Southbound I-205 near 10th Street (MP 27.80)

Based on the highest observed 5 min. flow rate of 1,970 vphpl = 100%



Northbound I-205 near 10th Street (MP 27.80)

Based on the highest observed 5 min. flow rate of 1,630 vphpl = 100%



Data sources and analysis: WSDOT Southwest Region Planning Office and WSDOT Office of Strategic Assessment and Performance Analysis.

Notes: See p. 2 for throughput definitions and how to read these graphs.

Stamp graphs of congestion by time of day on Vancouver region freeways

2012 and 2014 weekdays; Percent of days the average speed was slower than 45 mph

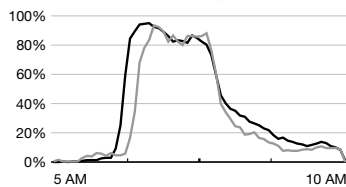
Morning

Evening

Morning

Evening

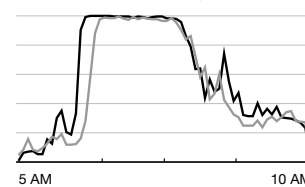
I-5: I-205 IC to I-5 Bridge (OR)



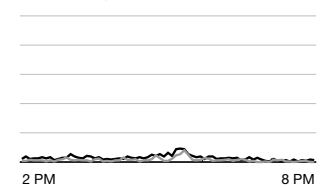
I-5: I-5 Bridge (OR) to I-205 IC



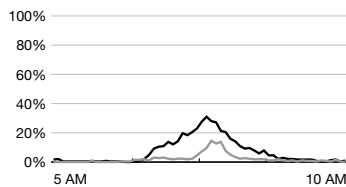
I-5: SR 500 IC to I-5 Bridge (OR)



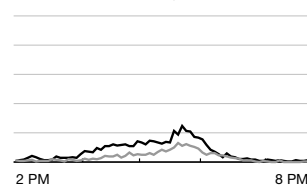
I-5: I-5 Bridge (OR) to SR 500 IC



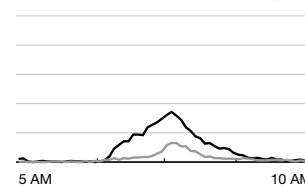
I-205: I-5 IC to G Jackson Brdg (OR)



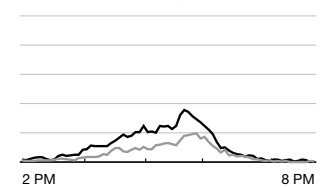
I-205: G Jackson Brdg (OR) to I-5 IC



I-205: SR 500 IC to G Jackson Brdg (OR)



I-205: G Jackson Brdg (OR) to SR 500 IC



Data sources and analysis: National Performance Management Research Data Set and WSDOT Office of Strategic Assessment and Performance Analysis.

Notes: IC stands for interchange, OR stands for the Oregon/Washington state border, G Jackson Brdg stands for Glen Jackson Bridge. See p. 2 for congestion definitions and how to read these graphs.

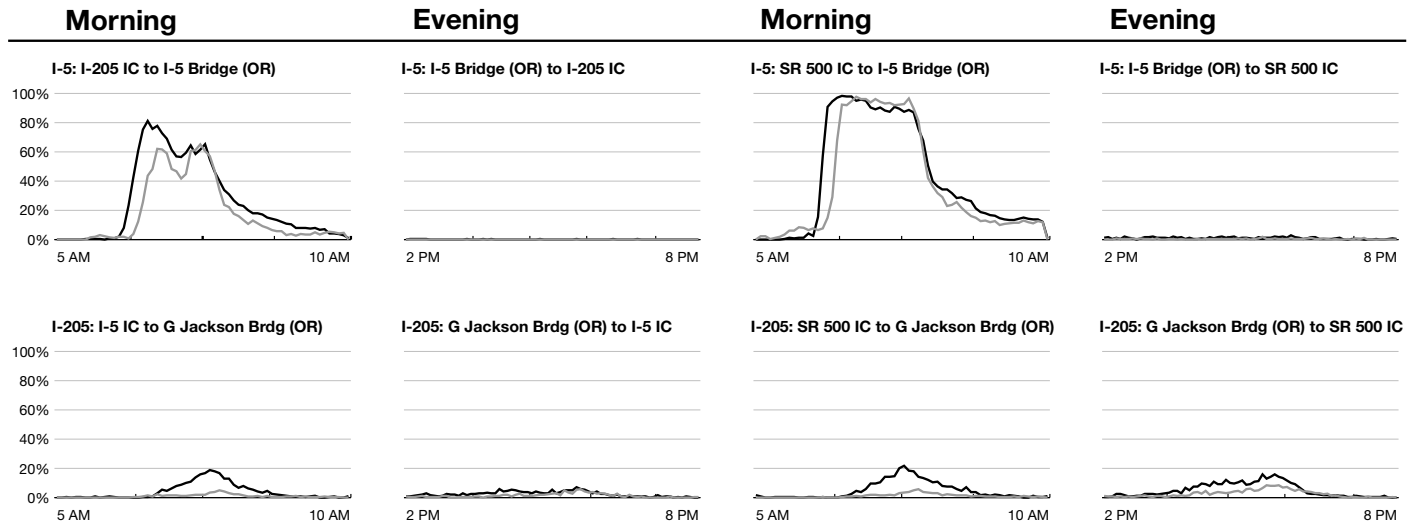
— 2012 — 2014

Vancouver Region

Stamp graphs and routinely congested segments

Stamp graphs of SEVERE congestion by time of day on Vancouver region freeways

2012 and 2014 weekdays; Percent of days the average speed was slower than 36 mph



Data sources and analysis: National Performance Management Research Data Set and WSDOT Office of Strategic Assessment and Performance Analysis.

Notes: IC stands for interchange, OR stands for the Oregon/Washington state border, G Jackson Brdg stands for Glenn Jackson Bridge. See p. 2 for congestion definitions and how to read these graphs.

— 2012 — 2014

2012 Vancouver region routinely congested segments¹

2012 weekdays; Length of congestion in miles; Duration of congestion in hours:minutes

Route and direction	Morning peak period				Evening peak period			
	Start and end times	Begin and end milepost	Length	Duration	Start and end times	Begin and end milepost	Length	Duration
I-5 southbound	6:15-8:45 a.m.	2.9-0	4.1 ²	2:30				

2014 Vancouver region routinely congested segments¹

2014 weekdays; Length of congestion in miles; Duration of congestion in hours:minutes

Route and direction	Morning peak period				Evening peak period			
	Start and end times	Begin and end milepost	Length	Duration	Start and end times	Begin and end milepost	Length	Duration
I-5 southbound	6:15-9:05 a.m.	2.9-0	4.1 ²	2:50				

Source: WSDOT Office of Strategic Assessment and Performance Analysis, Private sector data

Notes: 1 These tables only includes routine congestion that occurs in Washington state. Significant congestion occurs in Oregon on I-5 and I-205 that affects commuters in the Vancouver area. 2 This congested segment extends 1.2 miles into Oregon roughly to the Jantzen Beach exit (milepost 308). Additional southbound congestion occurs on I-5 further into Oregon.

Commute trip analysis

Ferry system ridership by route

2012 and 2014; Annual ridership for passengers and vehicles

	Number of passengers			Number of vehicles and drivers			Combined ridership		
	2012	2014	%Δ	2012	2014	%Δ	2012	2014	%Δ
Anacortes – San Juan domestic	906,950	1,012,173	12%	848,284	899,091	6%	1,755,234	1,911,264	9%
Anacortes – San Juan – Sidney, B.C.	87,105	92,225	6%	48,188	47,666	-1%	135,293	139,891	3%
Edmonds – Kingston	1,782,910	1,904,234	7%	2,025,025	2,098,533	4%	3,807,935	4,002,767	5%
Fauntleroy – Vashon – Southworth	1,212,298	1,243,925	3%	1,674,168	1,674,960	0%	2,886,466	2,918,885	1%
Mukilteo – Clinton	1,744,541	1,798,566	3%	2,090,426	2,151,070	3%	3,834,967	3,949,636	3%
Point Defiance – Tahlequah	266,594	289,042	8%	383,224	415,694	8%	649,818	704,736	8%
Port Townsend – Coupeville (Keystone)	360,752	382,610	6%	323,192	340,435	5%	683,944	723,045	6%
Seattle – Bainbridge Island	4,177,878	4,367,354	5%	1,940,639	1,953,466	1%	6,118,517	6,320,820	3%
Seattle – Bremerton	1,687,594	1,876,988	11%	641,728	645,628	1%	2,329,322	2,522,616	8%
Total	12,226,622	12,967,117	6%	9,974,874	10,226,543	3%	22,201,496	23,193,660	4%

Data source and analysis: WSDOT Ferries Division.

Ferry system route utilization for people and vehicles by route, and number of vessel trips taken

2012 and 2014; Annual utilization for passengers and vehicles

	Passengers + drivers			Vehicles			Number of trips		
	2012	2014	Δ	2012	2014	Δ	2012	2014	%Δ
Anacortes – San Juan domestic ¹	9%	12%	3%	53%	56%	3%	26,865	26,830	-0.1%
Anacortes – San Juan – Sidney, B.C.	17%	18%	1%	55%	55%	0%	756	752	-0.5%
Edmonds – Kingston	10%	11%	1%	65%	66%	1%	17,066	17,143	0.5%
Fauntleroy – Vashon – Southworth ²	9%	9%	0%	60%	60%	0%	40,960	40,808	-0.4%
Mukilteo – Clinton	12%	12%	0%	66%	66%	0%	26,808	26,732	-0.3%
Point Defiance – Tahlequah	6%	7%	1%	45%	50%	5%	13,818	13,843	0.2%
Port Townsend – Coupeville (Keystone)	11%	11%	0%	64%	66%	2%	8,535	8,556	0.2%
Seattle – Bainbridge Island	15%	15%	0%	60%	61%	1%	16,571	16,493	-0.5%
Seattle – Bremerton	13%	15%	2%	44%	45%	1%	10,863	10,882	0.2%
Total	11%	12%	1%	59%	61%	2%	162,242	162,039	-0.1%

Data source and analysis: WSDOT Ferries Division.

Notes: 1 Route utilization for the San Juan inter-island route is measured at Anacortes. 2 Route utilization for the Fauntleroy - Vashon - Southworth "triangle route" is measured at Fauntleroy. 2012 numbers have been updated to show a change in allotment assumptions.

Ferry system trip reliability and on-time performance by route

2012 and 2014; System-wide goals are: Reliability = 99% and on-time = 95%

	System-wide reliability			On-time performance		
	2012	2014	Δ	2012	2014	Δ
Anacortes – San Juan domestic	99.8%	99.7%	-0.1%	88.0%	90.3%	2.3%
Anacortes – San Juan – Sidney, B.C.	100.0%	98.2%	-1.8%	88.8%	90.1%	1.3%
Edmonds – Kingston	100.0%	99.6%	-0.4%	99.3%	98.6%	-0.7%
Fauntleroy – Vashon – Southworth	99.4%	99.4%	0.0%	95.6%	92.3%	-3.3%
Mukilteo – Clinton	99.8%	99.8%	0.0%	98.7%	97.5%	2.0%
Point Defiance – Tahlequah	99.4%	99.8%	0.4%	99.4%	99.6%	-1.2%
Port Townsend – Coupeville (Keystone)	96.9%	95.6%	-1.3%	93.3%	95.3%	0.2%
Seattle – Bainbridge Island	100.0%	99.8%	-0.2%	97.3%	94.2%	-3.1%
Seattle – Bremerton	99.4%	99.9%	0.5%	97.9%	98.1%	0.2%
Total	99.5%	99.4%	-0.1%	95.8%	94.8%	-1.0%

Data source and analysis: WSDOT Ferries Division.

Notes: Reliability is the percent of scheduled trips that were made; On-time performance is the percent of trips departing within 10 minutes of the scheduled departure time

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The Corridor Capacity Report is developed and produced by a small team of data scientists at the WSDOT Office of Strategic Assessment and Performance Analysis each year, with the help of dozens of individuals both at WSDOT and across the state's transportation community. WSDOT gratefully acknowledges their contributions.

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