Travel Time Trends Semi-Annual Report

WSDOT tracks, compares Seattle-area travel time trends for the first halves of 2010, 2011 and 2012

This semi-annual travel time analysis provides up-to-date insights on traffic patterns in the Puget Sound area for the first six months of 2012 compared to first six months of 2011. Key findings include:

Non cross-lake routes (2012 vs. 2011):

- Noticeable changes were observed in peak period and daily volumes ranging 0.0 to -6 percent.
- Travel time changes were modest on seven out of ten non cross-lake routes.
- Federal Way to Seattle and Everett to Bellevue morning commutes saw more than two minute increases in average travel times.
- Extreme January weather had a significant impact on the six month average volumes.
- Excluding January data the five month average volume was higher by 2 to 4 percent in 2012 than in 2011.

Cross-lake (SR 520, I-90) routes (2012 vs. 2011):

- Significant changes were observed on commute routes involving SR 520 and I-90.
- SR 520 tolling resulted in traffic volume reductions ranging between 18 and 38 percent.
- As a result of SR 520 tolling, I-90 saw increases in traffic volumes up to 10 percent
- Routes using SR 520 saw up to a three minute improvement in average travel times, and up to nine minutes in reliable travel times.
- Routes using I-90 saw a one minute increase in average travel times while reliable travel times were more mixed, based on direction of travel and time of day.
- Extreme January weather had a significant impact on the average six month volumes.

This article focuses on a sample of 18 key commute routes in the Seattle area, and highlights the 2012 annual Congestion Report. Cross-lake routes are defined as those which include SR 520 and I-90 across Lake Washington.

SR 520 tolling causes significant traffic changes on cross-lake routes

The table on page 22 summarizes the travel time and vehicle volume changes that occurred for selected routes in the central Puget Sound region in the first six months of 2012, compared to the same period in 2010 and 2011.

Peak, daily volumes alter from first halves of 2011-12 on non cross-lake routes

Noticeable differences were observed in year-over-year volume changes when comparing routes that cross Lake Washington with those that do not. On the sampled routes that do not cross Lake Washington on SR 520 or on I-90, vehicle volumes during the first six months of 2012 were unchanged or somewhat lower during the morning and evening peak commuting periods, compared to the same days in 2011; changes on those routes ranged from 0.0 percent to -6 percent. Daily volumes showed similar patterns, with changes ranging from 0 percent to -3 percent. These changes in vehicle volumes on the non-lake routes are somewhat larger than the corresponding changes from 2010 to 2011, which ranged from 0.0 percent to -2 percent (peak period) and +1 percent to -3 percent (daily volumes). However, there is an important mitigating factor regarding the changes from 2011 to 2012, involving the effect of unusual weather events in January 2012 (see p. 23).

Cross-lake routes see significant volume changes in first half of 2012

By far the most significant changes in peak period and daily vehicle volumes were observed on the I-90 and SR 520 corridors across Lake Washington, where some traffic changes were

Travel Time Trends Highlights

Volume changes were noticeable in non cross-lake routes (0.0 percent to -6 percent).

Cross-lake routes saw significant volume changes (double digits) as expected due to SR 520 tolling.

Vehicle volumes on cross-lake routes using SR 520 saw reductions due to tolling ranging between 18 and 38 percent. While cross-lake routes using I-90 saw an increase in vehicle volume by no more than ten percent.

Extreme January winter weather contributed to the reduction in overall semi-annual vehicle volume on Puget Sound routes.

Travel time changes were modest on non cross-lake routes.

Cross-lake routes using SR 520 saw big improvements in average (up to three min.) and reliable (up to nine min.) travel times.

I-90 average travel times increased by one minute or less and reliable travel times were more mixed based on travel direction and time of day.

www.wsdot.wa.gov/Tolling/SR 520/

Charting large peak period and daily volume changes on cross-lake routes

Travel time performance for Jan-June in 2010-2012 on a sample of 18 high demand commute routes

Morning (AM) peak is between 5 am and 10 am; Evening (PM) peak is between 2 pm and 8 pm; Length of route in miles; Travel times in minutes

		Average travel time in minutes during peak period			Peak average travel time change in minutes			Peak volume change		Daily volume change	
Route name (route length in miles)	Direction of travel	2010	2011	2012	2011 vs. 2010	2012 vs. 2011	2012 vs. 2010	2011 vs. 2010	2012 vs. 2011	2011 vs. 2010	2012 vs. 2011
Morning commutes											
I-5 Federal Way to Seattle (22)	NB	30	30	34	0	4	4	-1%	-1%	-2%	-2%
I-5 Everett to Seattle (24)	SB	32	31	31	-1	0	-1	0%	0%	-3%	-1%
I-5/I-405 Everett to Bellevue (24)	SB	33	33	36	0	3	3	-1%	-3%	-1%	-3%
I-405 Tukwila to Bellevue (13)	NB	20	21	23	1	2	3	-1%	-4%	0%	-2%
SR 167 Auburn to Renton (10)	NB	13	13	14	0	1	1	-1%	-6%	1%	-3%
I-405/I-90/I-5 Bellevue to Seattle (10)	SB/WB/NB	12	12	13	0	1	1	1%	5%	1%	8%
I-405/SR 520/I-5 Bellevue to Seattle (10)	NB/WB/SB	14	13	12	-1	-1	-2	-4%	-31%	-5%	-31%
I-5/I-90/I-405 Seattle to Bellevue (11)	SB/EB/NB	12	13	13	1	0	1	0%	7%	0%	10%
I-5/SR 520/I-405 Seattle to Bellevue (10)	NB/EB/SB	15	14	11	-1	-3	-4	-4%	-27%	-5%	-37%
Evening commutes											
I-5 Seattle to Federal Way (22)	SB	26	26	27	0	1	1	-2%	0%	-3%	-1%
I-5 Seattle to Everett (23)	NB	30	29	30	-1	1	0	0%	-2%	-1%	-2%
I-405/I-5 Bellevue to Everett (23)	NB	30	30	30	0	0	0	-2%	0%	-2%	0%
I-405/I-5 Bellevue to Tukwila(13)	SB	23	24	23	1	-1	0	-1%	-2%	0%	-1%
SR 167 Renton to Auburn (10)	SB	13	13	13	0	0	0	0%	-3%	1%	-2%
I-405/I-90/I-5 Bellevue to Seattle (10)	SB/WB/NB	16	16	17	0	1	1	0%	2%	1%	8%
I-405/SR 520/I-5 Bellevue to Seattle (10)	NB/WB/SB	21	19	16	-2	-3	-5	-2%	-18%	-5%	-31%
I-5/I-90/I-405 Seattle to Bellevue (11)	SB/EB/NB	12	13	14	1	1	2	-2%	6%	0%	10%
I-5/SR 520/I-405 Seattle to Bellevue (10)	NB/EB/SB	14	14	13	0	-1	-1	-4%	-38%	-5%	-37%

Data source: WSDOT Northwest Region and the Washington State Transportation Center (TRAC) at the University of Washington.

Note: Travel time and volume data for weekdays only. General purpose lane volumes only, HOV/HOT lane volumes not included. Trips on I-90 and SR 520 are shown for both directions, in both AM and PM periods; daily volumes are duplicates in both the AM and PM routes. Travel time table values are based on six-month comparison (January – June 30 for 2010, 2011, 2012). A negative change in travel times indicates faster travel times. Beginning with the semi-annual report published in February 2012, peak period definitions match the definitions used in the annual Congestion Report. Travel time and volume data for older comparison years were adjusted accordingly; therefore, values in this table are not directly comparable to those published in previous semi-annual reports.

anticipated following the start of tolling operations on the SR 520 bridge. Overall, SR 520 vehicle volumes were down significantly in the first half of 2012 on a year-over-year basis, while I-90 volumes were up somewhat. This was the case for both peak period volumes and daily weekday volumes.

During the morning commute, SR 520 corridor vehicle volumes just east of the SR 520 bridge were down by 31 percent westbound, and 27 percent eastbound, on a year-over-year basis. During the evening commute, SR 520 volumes were down by 18 percent westbound, and 38 percent eastbound. There were volume increases on the (non-tolled) I-90 cross-lake route, with westbound volumes up by 5 percent during the morning peak period and up by 2 percent in the evening peak period, and eastbound volumes up by 7 percent in the morning and up by 6 percent in the evening. Daily volumes were similarly affected, with SR 520 volumes down by 31 percent (westbound) and 37 percent (eastbound), and I-90 volumes up by 8 percent (westbound) and 10 percent (eastbound). The cross-lake traffic volumes were also affected by the previously mentioned weather conditions in January 2012 (see p. 23).

Non cross-lake routes see modest travel time changes during the first half of 2012 vs. 2011

On most of the sampled routes, first half of 2012 travel times changed modestly during the morning and evening peak commuting periods, compared to the same days in 2011. Of the ten

SR 520 sees travel performance and reliability improvements

non cross-lake commute routes sampled for this analysis, seven routes showed little to no change in travel times during the past year. Of the other three routes, the largest year-over-year travel time change occurred on the Federal Way to Seattle morning peak period route. Travel times on this route increased by about four minutes from the first half of 2011 to the first half of 2012. In addition, the two morning trips on I-405 heading toward Bellevue both experienced slower travel times, year-over-year: Tukwila to Bellevue (northbound), experienced a two-minute increase in travel time, while Everett to Bellevue (southbound), experienced a three-minute increase.

Comparing cross-lake travel performance and reliability for the first halves of 2012 and 2011

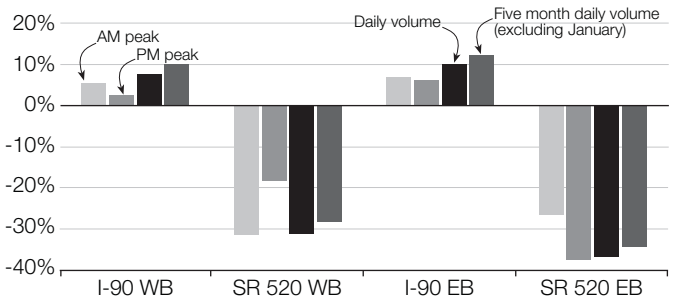
The eight remaining trips use the I-90 and SR 520 bridges. Two of the trips between Bellevue and Seattle via the SR 520 bridge experienced a three-minute year-over-year improvement in travel times: the eastbound direction during the morning peak period, and westbound direction during the evening peak period. The other two SR 520 trips (westbound morning and eastbound evening) showed slightly faster travel times in the first half of 2012. On I-90, trips show slightly slower travel times thus far in 2012. The cross-lake trips have routes that start in downtown Bellevue and stop in downtown Seattle, or vice versa, and therefore include some segments of the I-5 and I-405 freeways. As a result, the travel times for the cross-lake routes include the effects of any congestion on those other freeway facilities.

In addition to changes in average peak period travel times, the Lake Washington cross-lake routes experienced some change in travel reliability as well. One way to measure reliability is to observe changes in the day-to-day variability of travel times, using the reliable (90th percentile) travel time as an indicator. In the case of SR 520, the 90th percentile travel time was down by seven to nine minutes (morning peak), and two to five minutes (evening peak) from 2011 to 2012. In fact, for every combination of peak period and travel direction, travel times on SR 520 were lower for the 50th (median), 80th, 90th, and 95th percentiles, suggesting improved reliability of travel times on that route. On I-90 routes, the 90th percentile travel time changes were mixed, ranging from +4 to -2 minutes, depending on travel direction and time of day.

Other factors that influence travel trends

Employment: The first six months of 2012 saw employment levels grow in the region compared to the same period the year before. Average employment levels were up by 2.4 percent in King and Snohomish counties in the first half of 2012 compared to the same period in 2011, while in Pierce County employment was up by 2.6 percent. A review of longer-term trends helps to clarify the relative significance of these recent employment patterns. In 2007 and 2008, employment levels were still growing; however, this was followed by a year of region-wide declines in employment. Employment levels continued to drop across the region in 2010 though the percentage change was smaller than in the previous year. The past year saw the trend level off, with smaller changes than 2011 followed by upward movement in the first half of 2012.

Percent change in cross-lake vehicle volume
First half of 2012 vs. first half of 2011



Data source: Washington State Transportation Center (TRAC).

Gasoline Prices: Another factor that influences travel demand is the price of gasoline. Statewide, the average gas price for the first half of 2012 was up about 7 percent compared to the first half of 2011, at $3.93 per gallon. This represents the highest average gas price for the first half of a calendar year in the past eight years. During the first half of 2012, prices have fluctuated from $3.48 per gallon in January 2012, to $4.21 per gallon in May.

Extreme Weather: During January 2012 the Puget Sound area faced snow and freezing temperatures that affected traffic flow for nearly a week, from Jan. 15 through Jan. 20, 2012. The traffic levels during this period were low enough to have a noticeable effect on the overall average weekday vehicle volumes for the first half of 2012. In fact, if January is excluded from the data used to estimate the average vehicle volumes for the first half of 2012, the resulting values are 2 to 4 percent higher than the full six-month average (depending on location). This has a noticeable effect on the year-over-year changes from 2011 to 2012; peak period volumes based on five months of 2012 change by +2 percent to -4 percent, and the change in daily volumes varies from -1 percent to +2 percent. The magnitude of these revised changes is comparable to what was seen the previous year from 2010 to 2011, with 2012 volume changes slightly higher compared to those in the first half of 2011. This example shows how individual "outlier" events, such as unusual weather, can affect average vehicle volumes.