REVIEW OF INRIX PRELIMINARY SPEED ASSESSMENT ON I-405 FROM BELLEVUE TO LYNNWOOD

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The Inrix analysis used data from a limited number of locations (four) and produced a biased review of the performance of the corridor. Given the data resources that Inrix has at its disposal, one must wonder why the paper does not present a full review of the performance of the corridor.

One obvious concern in particular is the fact that its own summary table (Table 2) shows that speeds improved for the median and 85th percentile conditions at all four locations, but its conclusions state that "these segments show slower speeds in the peak hour of the general purpose lanes." The report then makes the unsupported assumption that the 85th percentile speed improvements are due to HOT lane performance.

DATA QUALITY

One reason Inrix made this assumption is that the data it collected do not directly differentiate between traffic in the general purpose and HOT lanes (or HOV lanes for measurements performed in 2014). Inrix uses primarily GPS data from vehicle probes, and notably, the GPS location accuracy is not good enough to identify travel by lane. Therefore, Inrix has no idea which vehicles reporting speed data are in the HOT lane and which are in the GP lanes. Therefore, it must make assumptions about where higher speed travel is occurring. Those assumptions appear to be questionable. And although the underlying GPS speed data points are certainly valid, the assumption that the 85th percentile represents HOT lane performance is not.

ACTUAL CORRIDOR PERFORMANCE 2014 VERSUS 2015

The best description of the performance of the I-405 general purpose (GP) lanes in 2014 (with HOV operations) versus 2015 (with HOT operations) would be to say that outcomes in corridor performance are varied, with the change in performance depending on the location within the corridor being examined.

Mean travel times southbound from I-5 to downtown Bellevue during the peak period have decreased slightly, although a number of very bad congestion days have occurred. This means that on most days, travel is better now than before the start of the HOT lane operation, but on multiple days, travel was particularly bad.

Mean travel times northbound from the Bellevue CBD to I-5 have not improved. They have stayed roughly the same.

At the same time, HOT lane travel times in both directions are faster and more reliable than the HOV lane travel times for the same months in 2014.

However, individual GP segments within the corridor have shown marked changes that are different than the travel times reported for the entire length of the corridor. There are segments within the corridor, in both directions, that are more congested since the start of HOT lane operations. At the same time, there are segments within the corridor that are much less congested. Inrix appears to have selected two poorly performing segments on the corridor and ignored the better performing parts of the corridor. Given the fact that Inrix has data for the entire corridor, one has to wonder why Inrix did not include the rest of the corridor in its analysis. The omission of other corridor segments means that the Inrix results are a biased description of corridor performance.

Northbound Changes

Figure 1 shows the change in average weekday speed by time of day, northbound, comparing October 2014 through January 2015 with October 2015 through January 2016. This is a four-month period, whereas the Inrix data covered only Wednesdays for one month. So some differences between the figure and what Inrix showed are due to the difference in time period lengths and days included in the analysis. Green shows where speeds in the GP lanes improved. Red shows where congestion worsened. The corridor got much slower leaving Bellevue and through the SR 522 and SR 527 interchanges. Conversely, GP lane speeds actually improved in the middle section of the corridor. The Inrix northbound segments were taken only from the two red sections, ignoring the green portions of the corridor. **This graphic clearly shows why many people correctly perceive that conditions on I-405 have gotten worse.**

For those who travel on the southern portion of the corridor, that section does perform considerably worse than before the HOT lane. Similarly, those who drive through the SR 522 interchange and exit at SR 527 experience the second major new slowdown. However, a Bellevue to I-5 trip also gains the benefits of the faster travel through the Totem Lake section, and that improvement roughly balances the two slower sections for those traveling the length of the corridor (not every day, but on average).

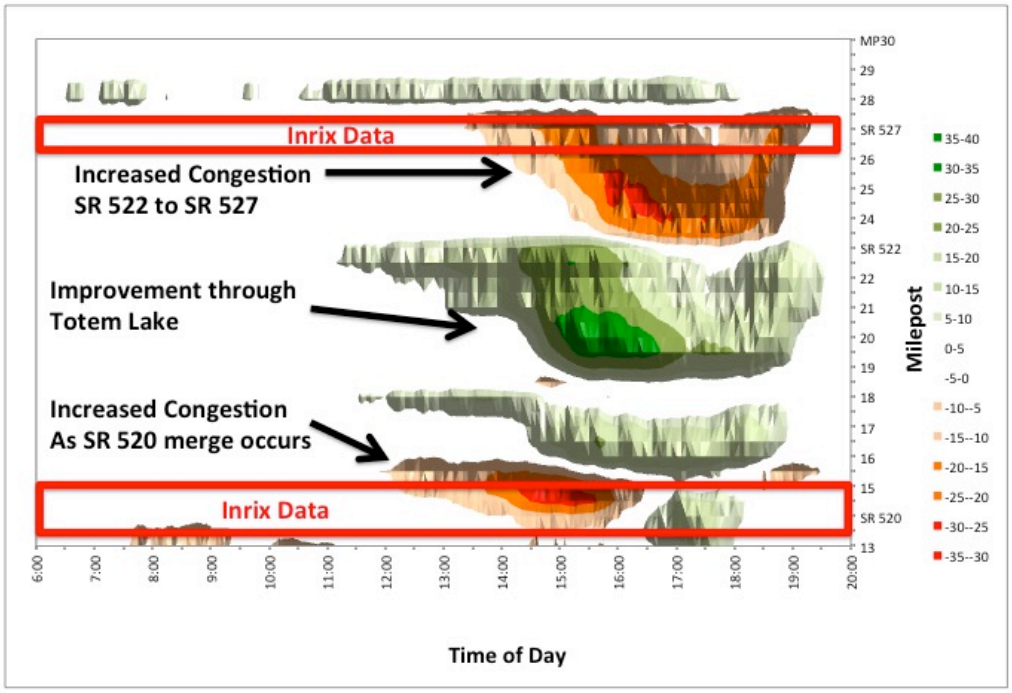
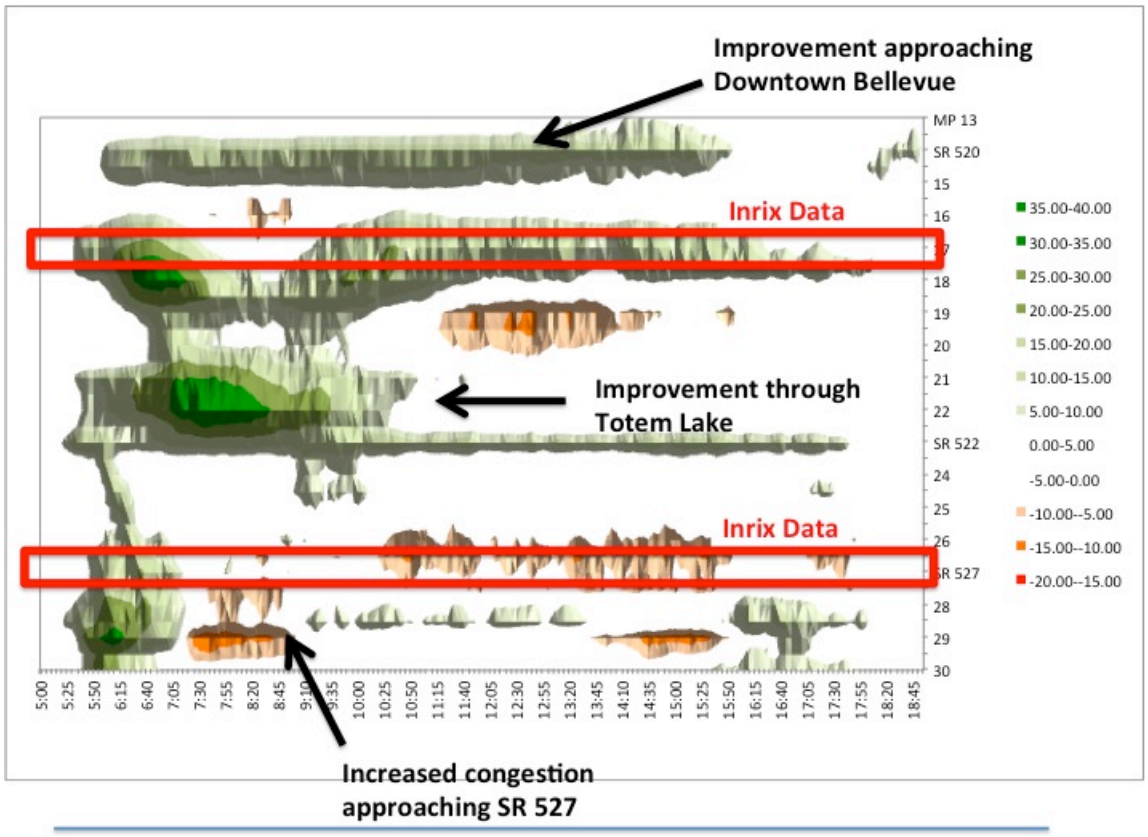


Figure 1: Where and when speeds changed northbound on I-405 GP lanes.
The change in average speeds: Oct 2015-Jan 2016 minus speeds in Oct 2014-Jan 2015.

Southbound Changes

Figure 2 shows the same graphic southbound. Southbound conditions improved in more corridor locations. This is shown both in Figure 2 and in the modest improvement in overall travel times for the trip from I-5 to Bellevue. However, congestion still increased in the vicinity of the SR 527 interchange. And that was one of the locations that Inrix selected for reporting.



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ARE INRIX DATA CORRECT?

WSDOT's data also show that in the locations for which Inrix reported data, the outcomes that Inrix described are occurring. For example, northbound at SR 527, figures 3 and 4 show the same decline in vehicle speeds for the 15th percentile speeds and the mean speeds. They also show the increase in length of time when congestion is present. So the data Inrix presented are not bad. Rather, they tell only a portion of the story.

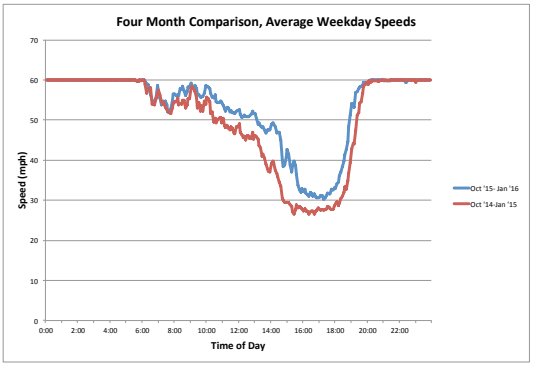

Figure 3: Mean speeds before/after at SR 527 northbound

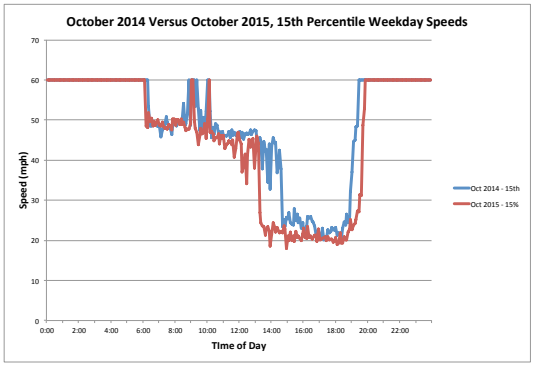

Figure 4: 15th Percentile speeds before/after at SR 527 northbound.

HOW DATA FROM DIFFERENT LOCATIONS TELL A DIFFERENT STORY

Moving to the sections of the corridor that are NOT exhibiting increasing congestion, the picture is very different. Figure 5 shows the same northbound movement, but at a location between Totem Lake and Kingsgate where improvements are present. In this image, or valid data, the speeds improve and the duration of the congestion period also greatly improves. If this location is used to describe the corridor, then the new lane configuration looks like a huge success. At this location that is actually true. However, for the corridor as a whole it is not.

This location bias is exactly the problem that the Inrix report exhibits. Its numbers are not invalid. Rather, its choice of locations that represent only part of the changes occurring in the corridor is the problem.

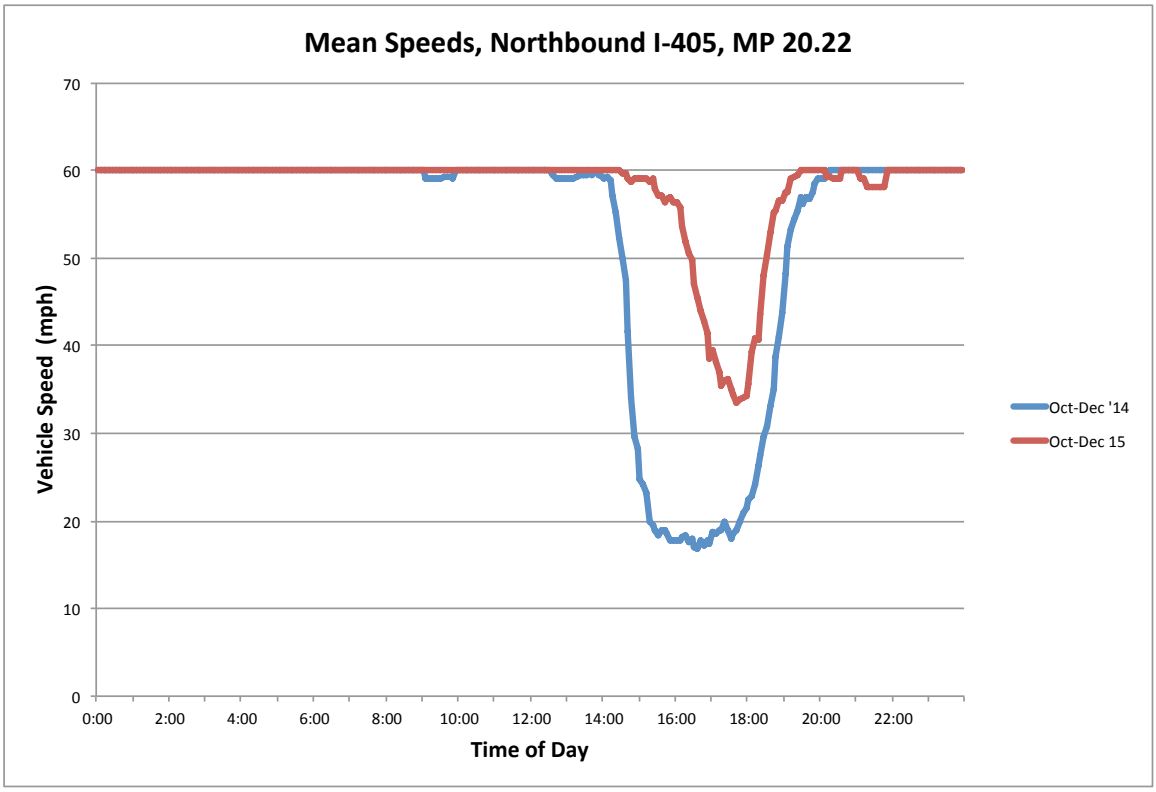

Figure 5. Change in vehicle speeds northbound in a section of the corridor that sees improvement.