

Part IV: Light Rail and Interstate 90

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Sound Transit's proposal to place light rail across I-90 will increase traffic congestion

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Summary

- Sound Transit's plan to place light rail on Interstate 90 will reduce overall vehicle capacity on the bridge by 15% during the morning peak commute and 8% during the afternoon.
- Light rail will increase vehicle delay on the bridge by 27% during the morning peak drive and 24% during the afternoon peak.
- ST2 will cause average westbound vehicle speeds to fall 21% during the morning peak commute and eastbound drivers in the afternoon would see a 17% decrease.
- Freight vehicles would suffer the most. During the morning peak drive, the number of freight trucks able to cross into Seattle would drop 24%. Leaving Seattle during the afternoon peak drive, trucks would see a 19% reduction in capacity.
- The light rail option will cost the commercial trucking industry about \$7.5 million annually simply to cross the I-90 bridge during peak commute times. This is 54% more than if policymakers did nothing on I-90.
- The light rail plan on I-90 also appears to violate the federal government's National Strategy to Reduce Congestion.

Introduction

One of the more controversial projects in Sound Transit's proposed second phase (ST2) is reconfiguring the center lanes of Interstate 90 (I-90) to accommodate up to 19 miles of light rail between Seattle and Bellevue. The proposal includes replacing the two center High Occupancy Vehicle (HOV) lanes that cross the bridge with light rail, a form of high capacity transit (HCT).

Because Sound Transit is already re-striping the outer lanes across the bridge to squeeze one HOV lane in each direction (approved in its first phase) Sound Transit claims there would be no net-change in lane capacity due to replacing the center lanes with light rail.¹ This claim is not entirely accurate and will be examined later.

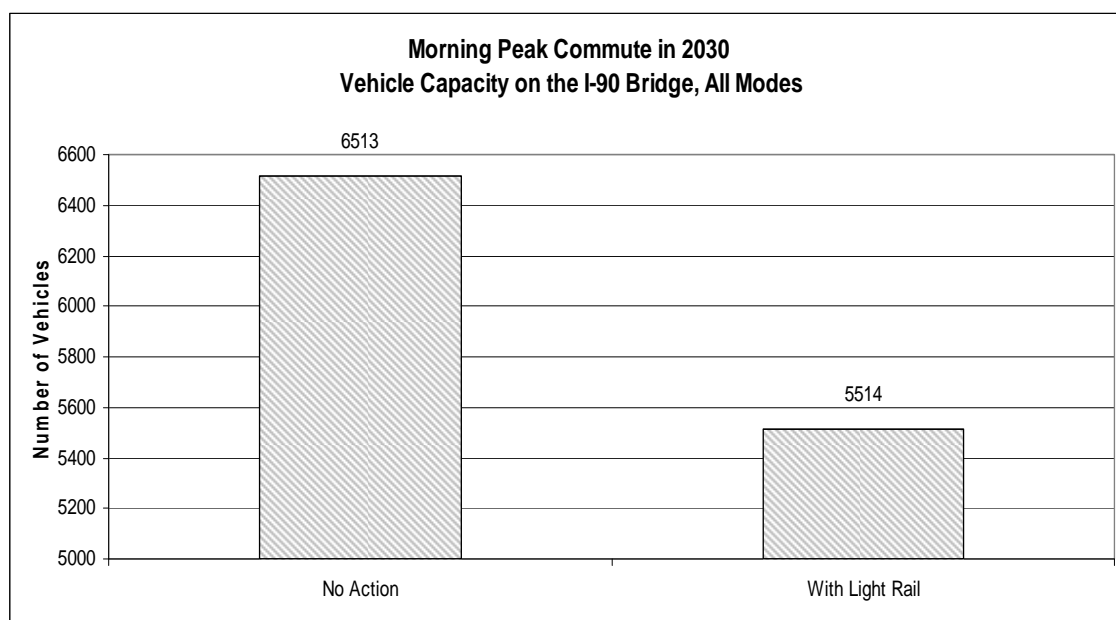
¹ http://www.soundtransit.org/Documents/pdf/projects/eastlink/East%20Link_Segment_A.pdf

Called East Link, Sound Transit estimates the light rail lines to Bellevue will have capital costs of \$3.017 billion in 2006 dollars, which represents nearly one-third of the total asset package in ST2. Sound Transit also estimates that once the East Link project is complete in 2030, ridership would range between 31,000 and 36,000 daily riders, depending on the routes chosen.²

Light Rail Would Make Traffic Congestion Worse

Sound Transit's East Link, which includes reconfiguring the center lanes on I-90 to accommodate light rail, would have a negative impact on the bridge's vehicle carrying capacity. In other words, Sound Transit's plan to place light rail across the I-90 bridge would make traffic congestion worse.

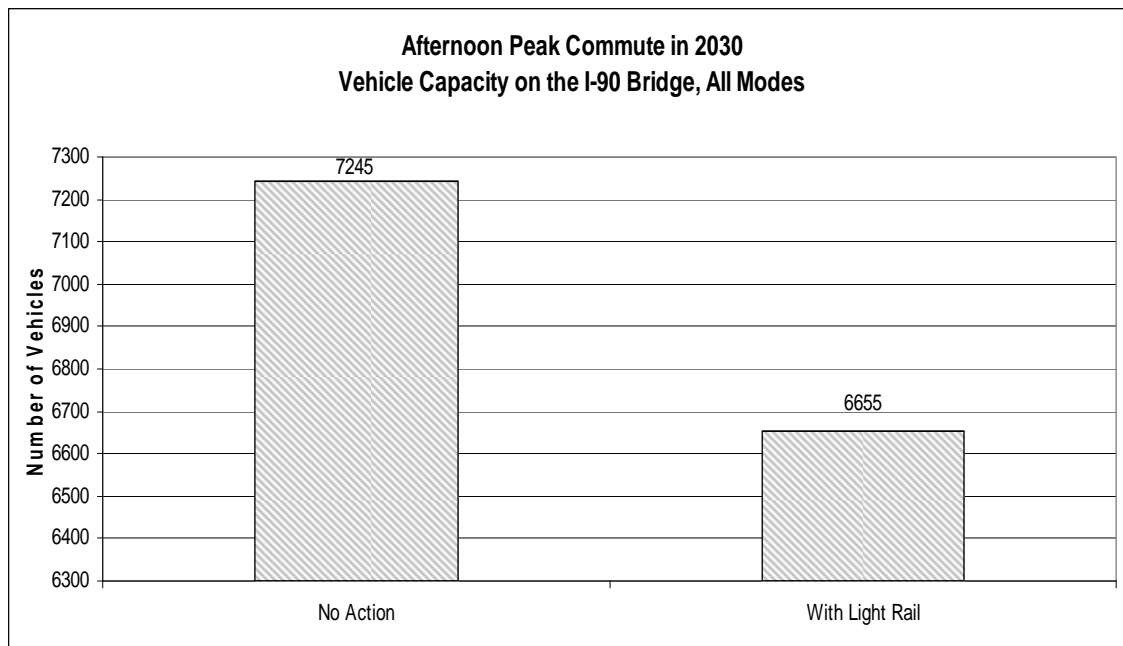
Consider the following charts, which illustrate the average daily vehicle carrying capacity of the I-90 bridge with and without light rail in 2030.³



Light rail would cut morning vehicle carrying capacity by 15%.

² <http://www.soundtransit.org/Documents/pdf/projects/eastlink/EastLinkBoardBriefingBook.11.9.06.pdf>

³ Data adapted from the Interstate-90 Center Roadway Study completed by the Washington State Department of Transportation in July 2006. The full report can be found here: <http://www.wsdot.wa.gov/NR/rdonlyres/2D30E991-6159-4F2A-A84B-284622643B79/0/I90CenterRoadwayStudy.pdf>.



Light rail would cut afternoon vehicle carrying capacity by 8%.

Including all modes, the morning peak commute at mid-span on the I-90 bridge would experience a 15% reduction in overall capacity and the afternoon peak commute would experience an 8% reduction in capacity.

This means the number of vehicles that can physically cross the I-90 bridge during the morning and afternoon peak commutes would be reduced as a direct result of adding light rail to I-90.

Accounting for different modes, freight vehicle drivers would suffer the most. During the morning peak drive, the number of freight trucks able to cross the bridge into Seattle would drop by 24%. Leaving Seattle, truck drivers would see a 19% reduction during the afternoon peak commute.⁴

Drivers of single passenger vehicles would see a 20% reduction in throughput during the morning peak commute and a 10% reduction during the peak afternoon commute.

Drivers of High Occupancy Vehicles (HOVs) would not pay as steep of price as freight and single passenger drivers. During the morning peak commute, both 2-person and 3-person HOVs would enjoy a 9% increase in capacity. But peak afternoon HOV commuters will endure a 3% capacity reduction.

Increased Delay and Lower Vehicle Speeds

The reduction in throughput will lead to an increase in delay for drivers crossing Lake Washington on I-90.

⁴ Ibid.

In 2030, peak travel times in the morning from Eastgate to Seattle would increase from 32.5 minutes to 41.4 minutes with light rail.⁵ That is a 27% increase in delay over doing nothing. And eastbound drivers in the afternoon would see a 24% increase in delay.

In another measure, the average speed to cross the I-90 bridge would worsen with light rail. Westbound vehicle speeds would fall from 16.8 miles per hour in 2030, to 13.2 mph during the morning peak commute, a 21% reduction. Eastbound drivers in the afternoon would see a 17% decrease in their average speed.

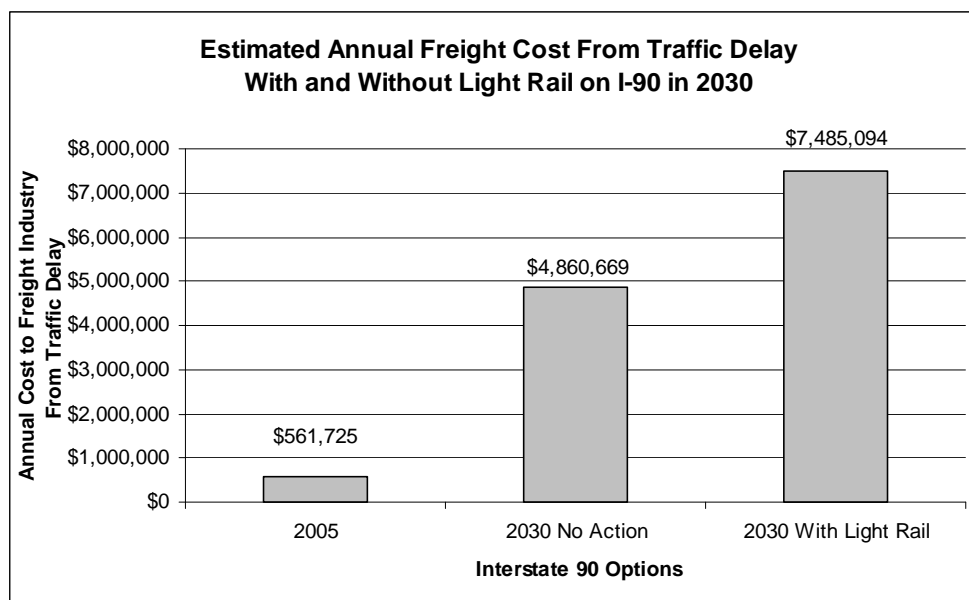
Economic Impact on Freight

The Federal Highway Administration (FHWA) estimates that freeway congestion costs each truck about \$32.15 per hour of delay in 2005.⁶

A free-flow commute across the 9.1 mile corridor on I-90 between Bellevue and Seattle should take 9.6 minutes, or 19.2 minutes roundtrip.⁷ Delay does not exist in this ideal scenario and thus does not result in a cost to the freight industry.

In 2005, the average roundtrip peak commute along the 9.1 mile corridor was 28.2 minutes.⁸ This means delay represented about 9 minutes, or 32% of a roundtrip peak commute. Using the FHWA's estimate, trucks making a roundtrip peak-hour commute across the I-90 bridge in 2005 incurred a cost from delay of about \$561,725.

The following chart illustrates the I-90 bottleneck and the cost to the commercial trucking industry, with and without light rail in 2030.



⁵ Ibid.

⁶ <http://www.fhwa.dot.gov/policy/otps/bottlenecks/execsum.htm>

⁷ The free-flow commute time was estimated using a Time, Speed and Distance calculator found here: <http://www.csghnetwork.com/csgtsd.html>. Assumed a highway speed of 60 miles per hour for 9.1 miles.

⁸ Data adapted from the Interstate-90 Center Roadway Study completed by the Washington State Department of Transportation in July 2006. The full report can be found here: <http://www.wsdot.wa.gov/NR/rdonlyres/2D30E991-6159-4F2A-A84B-284622643B79/0/I90CenterRoadwayStudy.pdf>.

In 2030, if I-90 remains the way it is today, the average roundtrip peak commute is estimated to take 45.1 minutes.⁹ Adjusting for inflation, the cost to the freight industry would be about \$4.9 million per year, or \$8,596 per truck.¹⁰

Under the light rail option, the average roundtrip peak commute would climb to 54 minutes and truck capacity would fall by 20%. Despite 20% fewer trucks able to cross the bridge during the peak commute, the cost to the freight industry would be more than \$5.2 million annually, costs that will be passed on to consumers through higher prices. Assuming the remaining 20% of trucks would still need to cross the lake either by finding an alternative route or waiting for the congestion on I-90 to clear, the total cost to the commercial trucking industry would climb to \$7.5 million, or \$13,157 per truck.

In other words, Sound Transit's light rail proposal would directly increase the cost to the commercial trucking industry by \$2,624,425 million a year, or \$4,561 more per truck, just to cross the I-90 bridge during the peak commute. This is 54% more costly than if Sound Transit did nothing on I-90.

Causes of Increased Delay

The negative traffic impacts caused by Sound Transit's light rail plan across I-90 can be attributed to three factors: narrower lanes, weave and capacity.

In order to squeeze a single HOV lane into the main-line, Sound Transit is re-striping the current roadway to make the shoulders and general purpose lanes smaller. The narrower roadway will have two effects: drivers would generally be forced to slow down, and traffic accidents would make it harder for drivers to negotiate the smaller roads.

As with most restricted lanes, merging will also slow traffic. Without direct access ramps, transit and carpool drivers would have to cross three general-purpose lanes before they reach the exclusive HOV lane.

The third factor is lane capacity. Sound Transit says that replacing the two reversible center lanes with single HOV lanes in the outer roadways does not reduce lane capacity.¹¹

This is not entirely accurate. During the morning peak commute drivers have a total of five westbound lanes (three general purpose and two HOV lanes). With Sound Transit's reconfiguration, capacity would fall to only four westbound lanes. The same reduction would occur during the eastbound commute in the afternoon. This is a 20% reduction in lane capacity during the morning and afternoon peak commute hour.

The Federal Government's Concerns

Sound Transit intends to seek federal funds for its East Link Project, but the federal government has already expressed "concern for the degradation of the function of I-90."¹² And

⁹ Ibid.

¹⁰ Assumes an annual 3.5% rate of inflation. The WSDOT corridor study estimates an average of 570 trucks crossing the bridge in 2030 during the morning and afternoon peak commute.

¹¹ http://www.soundtransit.org/Documents/pdf/projects/eastlink/East%20Link_Segment_A.pdf

¹² <http://www.soundtransit.org/Documents/pdf/projects/eastlink/EastLinkBoardBriefingBook.11.9.06.pdf>

since the corridor is a federal highway, the federal government has jurisdiction over the approval process.¹³

The I-90 project also appears to violate the federal government's National Strategy to Reduce Congestion, which allocates federal dollars based on a project's ability "to reduce congestion."¹⁴

In fact, the Federal Highway Administration (FHWA) has already raised concerns to Sound Transit "about how the proposal of HCT in the I-90 corridor will impact I-90 operations and safety."¹⁵

If the federal government decides the loss of vehicle capacity is unacceptable, Sound Transit could either lose all federal funding, which means taxpayers could be on the hook for the additional costs or be forced to abandon light rail entirely for another HCT alternative, like a Bus Rapid Transit/High Occupancy Vehicle (BRT/HOV) option.

Either way, the changes would be significant and occur only after voters had already decided on the current proposal laid before them by Sound Transit.

Conclusion

Not only would this proposed project fail to reduce traffic congestion, Sound Transit's \$3 billion plan to place light rail across I-90 would ironically make congestion worse. This would have a negative impact on drivers, and would cost the commercial trucking industry millions of dollars.

It is not fair to voters for Sound Transit to include the light rail project on I-90 in its \$30 billion proposal, when federal officials have already expressed their unease with a plan that increases traffic congestion and Sound Transit officials know the risks.

Interstate 90 is a federal highway and is the primary east/west corridor from Seattle to the eastern United States for both passenger and freight vehicles. Deliberately increasing congestion contradicts the core functions of government and further perpetuates the public's skepticism about the process.

When comparing Sound Transit's light rail plan across I-90 with the no-action option, drivers and consumers actually would be better off if policymakers did nothing.

This is the fourth chapter in an ongoing series of analysis on the RTID/ST2 ballot measure. The previous installments include: "Part I: The Cost of Sound Transit," "Part II: Your Transportation Tax Burden," and "Part III: Cost Exceeds Benefits in Sound Transit's Light Rail Expansion." Michael Ennis is the Center for Transportation Policy Director at Washington Policy Center. Nothing in this document should be taken as any attempt to aid or hinder the passage of any legislation before any legislative body. Contact Washington Policy Center at 206-937-9691 or www.washingtonpolicy.org.

¹³ Ibid.

¹⁴ <http://www.fhwa.dot.gov/congestion/index.htm>

¹⁵ <http://www.soundtransit.org/Documents/pdf/projects/eastlink/EastLinkBoardBriefingBook.11.9.06.pdf>