Appendix F1 I-205 Toll Project Truck Toll Multiplier Sensitivity Analysis – Economic Effects

I-205 Toll Project Truck Toll Multiplier Sensitivity Analysis – Economic Effects Memorandum

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Subject	I-205 Toll Project Truck Toll Multiplier Sensitivity Analysis – Economic Effects

The *I-205 Toll Project Economics Technical Report* analyzes several potential economic effects from the I-205 Toll Project, including the long-term effects resulting from reduced vehicle miles travelled (VMT). These changes in regional travel behavior are expected to result in net user and social benefits, including reduced emissions, shorter travel times, improved truck on-time reliability, vehicle operating cost savings, fewer vehicle crashes, and prevention of pavement damage. These effects were analyzed by comparing the change in regional traffic patterns between the No Build and Build Alternatives from 2027 to 2045 and monetizing their value according to the U.S. Department of Transportation Benefit-Cost Guidance and standard industry practices. These effects are detailed in Section 6.2.2 of the *I-205 Toll Project Economics Technical Report* and are based on the assumption that all vehicles (i.e., passenger vehicles and trucks) would be charged the same toll rates.

This memorandum outlines the findings of a sensitivity analysis based on traffic modeling that applies a truck toll multiplier that assumes higher toll rates for medium and heavy trucks. The traffic model results with the Truck Toll Multiplier Scenario show reductions, relative to the No Build Alternative, of vehicle miles traveled (VMT). [1] However, traffic model results with the Truck Toll Multiplier Scenario have slightly different vehicle volumes and vehicle mix as compared to the Build Alternative. With the truck toll multiplier, referred to in this memorandum as the Truck Toll Multiplier Scenario, analysts considered potential economic effects of different toll rates based on vehicle class.

Table 1 quantifies the monetized value of the marginal benefits under the Build Alternative under the Truck Toll Multiplier Scenario. To maintain consistency of the output values with the input values and standardized factors, the values are discounted at an annual rate of 7% and reported in constant 2021 dollars.

[1] See the *I-205 Toll Project Truck Toll Multiplier Sensitive Analysis – Transportation Effects Memorandum.*

Table 1. Annualized Monetized Value of Traffic Benefits of the Build Alternative Relative to the No Build Alternative on I-205 (2027 to 2045)

Social Effects and User Costs	Average Annualized Value 2027-2045 (2021$, undiscounted)	Average Annualized Value 2027-2045 (2021$, discounted at 7%)
Travel Time Savings (Auto)	$32,326,000	$10,119,000
Travel Time Savings (Truck)	$31,535,000	$13,303,000
Improved Truck On-Time Reliability	$9,859,000	$3,913,000
Vehicle O&M Cost Savings	$41,214,000	$16,790,000
Avoided Pavement Damage	$3,090,000	$1,305,000
Traffic Noise Reduction	$560,000	$236,000
Emissions – Nitrogen Oxides	$467,000	$187,000
Emissions – Sulfur Oxides	$34,000	$14,000
Emissions –$PM_{2.5}$	$403,000	$174,000
Emissions – Carbon Dioxide	$2,637,000	$1,710,000
Vehicle Crash Injuries	($82,000)	$52,000
Vehicle Crash Fatalities	($5,000)	$3,000
Annual Net Benefits	$122,038,000	$47,806,000

Source: WSP Benefit-Cost Analysis Model 2021
O&M = operations and maintenance; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter

The values of the traffic benefits with the truck toll multiplier include similar total traffic volumes, but a lower percentage of truck traffic on I-205. [2] As such, this scenario results in a different distribution of benefits across trucks compared to auto. Compared to the results reflected in Section 6.2.2 of the *I-205 Toll Project Economics Technical Report*, this change shifts some of the benefits between auto travel time savings and truck travel time savings and increases vehicle operations and maintenance ("O&M") cost savings benefits.

[2] See the *I-205 Toll Project Truck Toll Multiplier Sensitive Analysis – Transportation Effects Memorandum.*