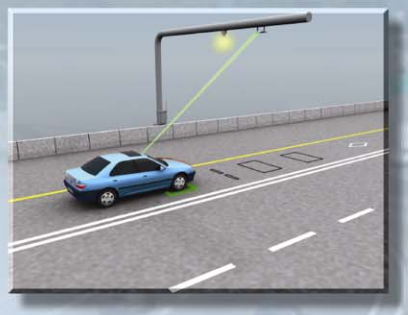
I-405 - SR 520 to I-5 Widening



Express Toll Lanes Alternative Traffic and Revenue Study

Washington State Department of Transportation

ENGINEERS
PLANNERS
ECONOMISTS
WilburSmith ASSOCIATES

in association with

Northern Economics, Inc.
Resource Systems Group, Inc.

I-405 - SR 520 to I-5 Widening

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Prepared for

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September 2007

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September 24, 2007

Ms. Patty Rubstello
Washington State Department of Transportation
Urban Corridors Office
I-405 Project Office
600 108th Avenue NE, Suite 400
Bellevue, WA 98004

Re: **Final I-405 – SR 520 to I-5 Widening Express Toll Lanes Alternative Study**

Dear Ms. Rubstello:

Wilbur Smith Associates is pleased to present you with the final *I-405 - SR 520 to I-5 Widening Express Toll Lanes Alternative Traffic and Revenue Study*. The study, conducted at an investment level, evaluated the potential traffic and toll revenue impacts of implementing Express Toll Lanes on I-405 from SR 520 northward to I-5. The express toll lanes give WSDOT a potent tool to improve the travel time and travel reliability for motorists who utilize the lanes. In addition, the express toll lanes have the added benefit of generating toll revenue that can be used to offset the costs of transportation improvements. Traffic and toll revenue estimates were developed for a Base condition, and for three variations of the Base condition. Traffic forecasts and gross annual toll revenues were developed for a twenty year forecast period ending in 2030.

We appreciate the opportunity to assist WSDOT in the analysis of this exciting project. We look forward to working with you on future transportation projects in Washington.

Respectfully submitted,

WILBUR SMITH ASSOCIATES

Gary Quinlin
Senior Associate

EXECUTIVE SUMMARY

I-405 was constructed in the early 1960s as a bypass around Seattle. Today, it is the major north-south travel route east of I-5. As I-5 became too congested to act as a reliable designated military route, I-405 assumed this role as well. Continued high rates of economic development and growth east of Lake Washington have resulted in traffic congestion on I-405 rivaling that of I-5. State officials recognize that in addition to the frustration experienced by motorists who use I-405 daily, the congestion limits access of transportation of goods, services and people by increasing travel times and generally reducing transportation reliability. Without improvements, future congestion will grow exponentially, further impacting the economy, the environment, and the general "quality of life" for those traveling on and living near the I-405 corridor.

PURPOSE OF STUDY

Wilbur Smith Associates (WSA) was contracted by the Washington Department of Transportation (WSDOT) to conduct a study on a section of I-405 in order to evaluate the potential traffic and toll revenue impacts of implementing express toll lanes. Express toll lanes have the potential to improve the travel time and travel-time reliability of motorists who are eligible to use the express toll lanes. Express toll lanes have the added benefit of generating toll revenue that can be used to offset the costs of transportation improvements. Specifically, the primary goal of this study is to estimate the traffic and toll revenue impacts of implementing an express toll lanes system on I-405 from SR 520 north to I-5. Toll revenue generation by the express toll lanes was estimated from 2010 (the assumed opening year) through 2030. Detailed traffic analyses were conducted in 2010, 2014, 2020, and 2030.

WSA was directed by WSDOT to conduct the study at an *investment level*. This means the study is of sufficient detail and level of effort to use for financing decisions. This level of effort includes an independent demographic and land-use analysis of the study corridor, the conduct of stated preference surveys to determine values of time for potential express toll lane patrons, and extensive detailed modeling to estimate the potential traffic and toll revenue, as well as operating conditions, associated with the express toll lanes.

In this study, annual toll revenue estimates are provided in both *current dollars* and *constant 2007 dollars*. Current dollars are defined as the dollar value at the time of the purchase, so the estimated annual toll revenue in 2010 reflects the value of the toll revenue in 2010 dollars. Constant dollars reflect the dollar value adjusted to a base year to

eliminate changes in price due to inflation. For example, if a latte cost $5.00 in 2007, and the price remained $5.00 in 2010 (current dollars), the latte would actually cost $4.63 in constant 2007 dollars assuming a 2.5 percent annual rate of inflation. In this study, inflation is assumed to average 2.5 percent through the study period, from 2007 through 2030.

DEFINITION OF EXPRESS TOLL LANES ON I-405

In this study an express toll lane is a high occupancy vehicle lane that allows vehicles with lower occupancy to have access to it by paying a toll. The amount of the toll would vary according to traffic demand. HOVs would continue to use the express toll lanes toll-free. To maintain the desired level of service in the express toll lanes, the toll for single occupant vehicles (SOVs) would be dynamically adjusted to control the number of SOVs willing to buy into the express toll lanes. Revenue generated from the express toll lanes can be used to help offset the costs of planned corridor improvements. In the I-405 analysis, it was assumed that the express toll lanes would operate between 5 a.m. and 7 p.m., just as the HOV lanes currently operate. Outside of those hours, the express toll lanes would be open to all motorists, toll-free. It was also assumed for the I-405 Study, that HOVs would be defined as passenger cars, pick-up trucks, and SUVs, with two or more occupants, and motorcycles. Express toll lane patrons would only be able to enter or exit at discrete ingress or egress locations. SOVs are required to participate in an electronic toll collection program in order to utilize the express toll lanes. The toll for each vehicle would be tracked through an electronic transponder. Strict surveillance of the express toll lanes would be required to ensure that toll violations are minimized.

In the I-405 Express Toll Lanes Study, the goal defined by WSDOT, was to maintain traffic flow in the express toll lanes at 1,500 vehicles per hour per lane in the I-405 Study Area that provides one express toll lane per direction, and to maintain a flow at 1,600 vehicles per hour per lane in the I-405 Study Area that provides two express toll lanes per direction. It was recognized that the express toll lanes traffic flow may be less than the target flow during time periods with lower overall demand on I-405, such as the middle of the day. Although the goal was to achieve the desired traffic flow, that goal had to be balanced with certain constraints in the I-405 corridor. Access to the express toll lanes had to be dampened at some ingress or egress ramps due to very high express toll lane traffic demand that would have resulted in large volumes of traffic crossing multiple general purpose (GP) lanes (free lanes) on I-405 to access the express toll lanes. The dampening of traffic was achieved by imposing toll surcharges at express toll lane access ramps when necessary. The overall effect was to preserve the function and safety of I-405; however, it did decrease the traffic flow on some sections of I-405 express toll lanes below the target level.

LEGISLATIVE ACTION AND STUDY PURPOSE

The Washington State Legislature passed Senate Bill 6091 during the 2005 session which called for consideration of managed lanes along I-405. The bill states, "The legislature intends that tolls be charged to offset or partially offset the costs for…widening of Interstate 405 including a managed lanes concept." This same bill also enacted a statewide study to examine tolling around Washington State, including the I-405 corridor, and called for tolls to be considered on other major Washington Department of Transportation (WSDOT) projects. Legislative focus on tolling has continued into the 2007 Regular Session. Engrossed Substitute House Bill 1095, Section 605, states:

> *Based on the anticipated outcomes of the of the tolling study, to be conducted under section 206 of this act, the legislature intends that tolls be charged to offset or partially offset the costs for the following projects, and that a managed lane concept be applied in their design and implementation: State Route 520 Bridge replacement and HOV project, and widening of Interstate 405.*

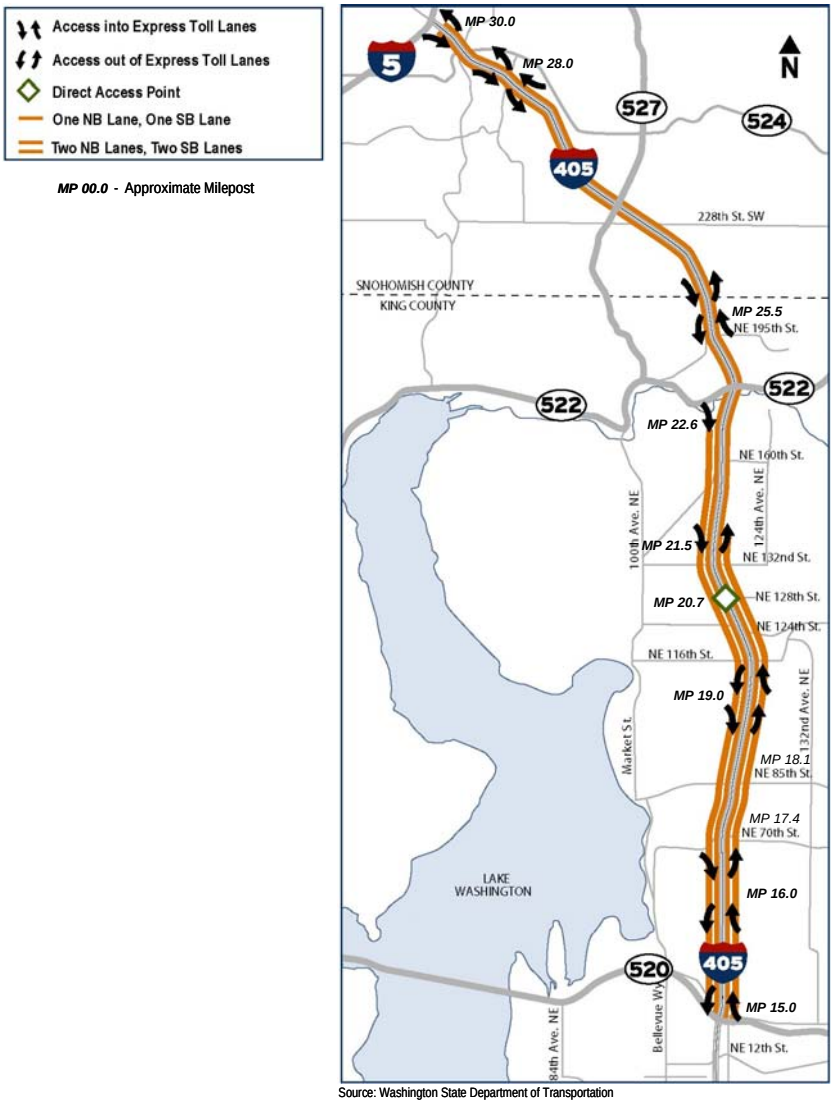
As a result of Senate Bill 6091, WSA was contracted to analyze the traffic and revenue impacts of implementing a specific variation of the managed lane concept called express toll lanes. While the legislation called for consideration of managed lanes along the length of I-405, this study considers only the area from SR 520 north to I-5.

PROJECT DESCRIPTION

The I-405, SR 520 to I-5 Widening Project will be built using the Nickel and Transportation Partnership Account (TPA) funds. The project will improve 15 miles of highway, extending from Mile Post (MP) 15.0 at SR 520 to MP 30.0 at Interstate 5. Construction will include building an additional lane in each direction between SR 520 and SR 522, an additional northbound lane from NE 195th Street to SR 527 in Bothell, and an improved NE 116th Street interchange. The project will also construct a braid that will separate the northbound off-ramp to SR 522 and the northbound on-ramp from NE 160th Street. The new lane between SR 520 and SR 522 and the existing HOV lane through this section will operate as two express toll lanes flowing in each direction. The existing HOV lane north of SR 522 will be converted to a single express toll lane, also flowing in each direction.

Figure ES-1 provides a visual representation of the single-lane and two-lane express toll lane sections, as well as the proposed express toll lane access locations. The MP positions shown in this diagram are approximations only: actual MPs will vary slightly for northbound and southbound access points.

Figure ES-1
Proposed Express Toll Lanes Configuration



Source: Washington State Department of Transportation

In addition to the access points at either end of the project, numerous intermediate access points are located between the general purpose and express toll lanes. Unlike today, when HOV vehicles can enter and exit HOV lanes at any location, express toll lane access will be limited to the locations shown in Figure ES-1.

The configuration shown in Figure ES-1 is considered the "Base Case" scenario for this study, WSDOT directed WSA to conduct the following three sensitivity tests of the Base Case:

- The first sensitivity test excludes SOVs from using the NE 128th St Direct Access to and from I-405. The direct access connection was built by Sound Transit and approved by FHWA with the restriction that the ramps are for HOV and transit vehicles only.

- A second sensitivity test extends the express toll lane system to NE 6th Street in Bellevue. The TPA-funded Northbound NE 8th St to SR 520 Braided Crossing Project in Bellevue includes necessary upgrades to I-405 that would allow for express toll lane operations. This project is scheduled to be completed after the SR 520 to I-5 project.

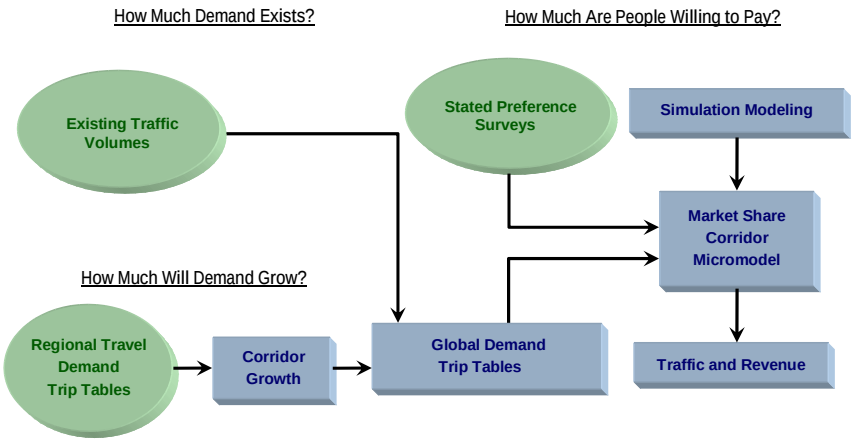
- The third sensitivity test determines the combined effect of excluding SOVs from the NE 128th St Direct Access with extending the system to NE 6th St.

Estimated traffic and revenue forecasts are provided for the Base Case and the three sensitivity tests. The Base Case and sensitivity tests assumed 2010 as the opening year. Traffic forecasts and gross annual toll revenues were developed for a 20-year forecast period ending in 2030.

EXPRESS TOLL LANES STUDY METHODOLOGY

Figure ES-2 provides a simplified overview of the modeling process used to estimate the traffic and gross toll revenue potential for express toll lanes on I-405. As shown, the modeling process seeks to answer three basic questions: How much demand currently exists in the corridor? How much will that demand grow over time? And, how much are people willing to pay for free-flow travel in the express toll lanes? A much more detailed description of the modeling process is provided in Chapter 5 (Modeling Approach, 5-2).

Figure ES-2
Simplified Study Methodology Flow Chart



EXISTING TRAFFIC DEMAND IN THE I-405 CORRIDOR

To help answer "how much demand exists?", WSA developed an operating profile of I-405 in the Study Area that documented the existing traffic volumes and travel conditions on the mainlines and ramps. This information was instrumental in calibrating and verifying the traffic model that was used to analyze the proposed express toll lanes. This is discussed in Chapter 2 of this Report.

SOCIO-DEMOGRAHIC REVIEW TO HELP ESTABLISH FUTURE YEAR TRAFFIC DEMAND

A socio-demographic analysis was performed by Northern Economics, Inc. (NEI) to review and modify future year forecasts of population, number of households and employment in the Study Area. The forecasts were prepared by the Puget Sound Regional Council (PSRC). The forecasts were the basis for the traffic trip tables that were used in the modeling process to evaluate the express toll lanes. NEI developed recommended changes to the PSRC future year forecasts. The recommended changes were reflected in the future year traffic trip tables (years 2010, 2014, 2020, and 2020) that were used in the express toll lane modeling. This work helped to answer the question of how much demand is estimated to exist in the corridor in future years.

Table ES-1 shows a summary of the overall impact on trip table growth between PSRC's trip tables and the trip tables that included NEI's socio-demographic analysis. The average annual growth rate between 2005 and 2010, and between 2010 and 2014, increased by 0.2 percent. Between 2014 and 2020, the average growth rate decreased by 0.1 percent, and there was no change between 2020 and 2030. The cumulative effect of these changes resulted in an increase of 2030 trip table volumes by approximately one percent (a relatively minor impact) from PSRC's trip tables to the trip tables that include NEI's socio-demographic analysis. The full analysis of NEI's analysis is presented in Chapter 3.

Table ES-1
Comparison of Unadjusted and Adjusted
PSRC Trip Table Growth Rates

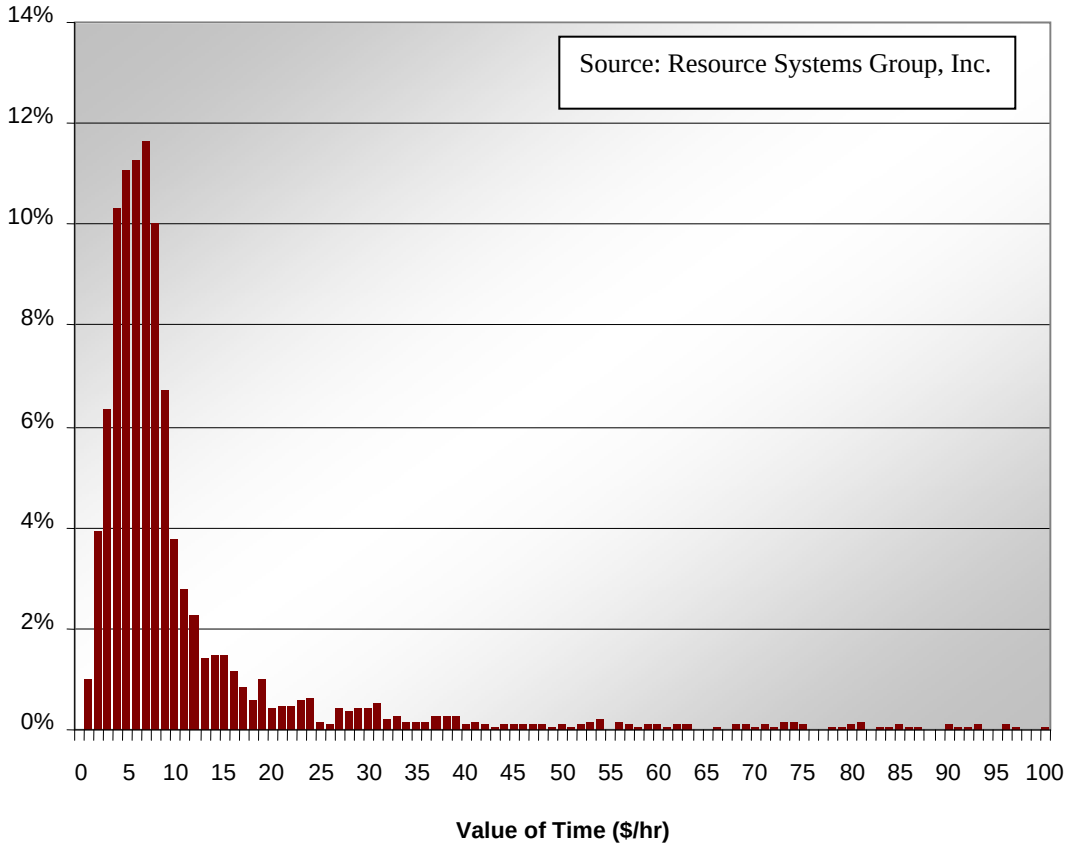
Average Annual Percent Growth

Period	Unadjusted PSRC Trip Tables	Trip Tables with NEI Adjustments
2005-2010	1.3 %	1.5 %
2010-2014	1.2	1.4
2014-2020	1.3	1.2
2020-2030	1.1	1.1

STATED PREFERENCE SURVEYS

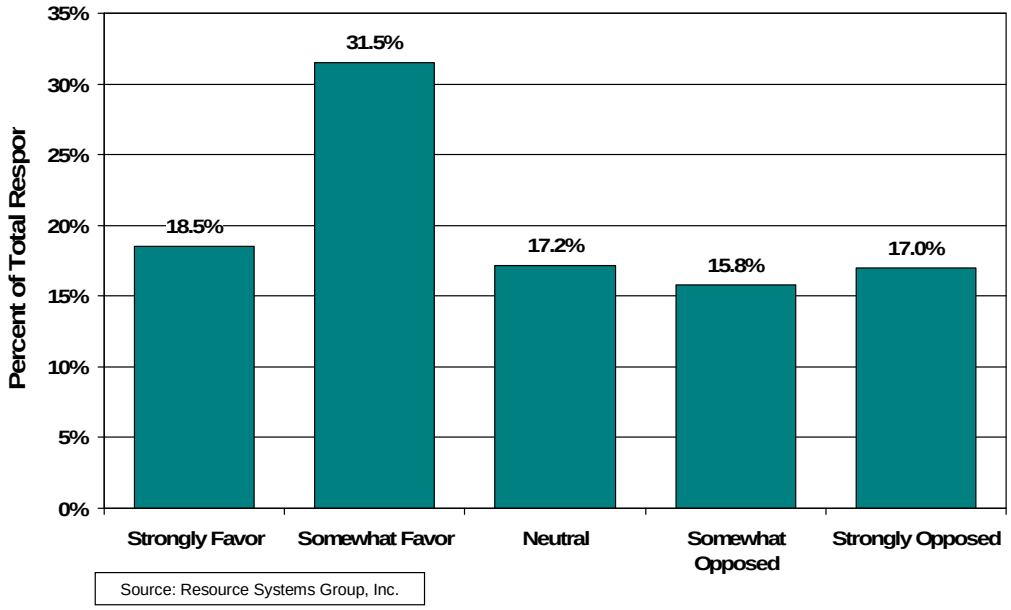
WSA retained the services of Resource Systems Group, Inc. (RSG) to conduct market research analysis in the I-405 corridor. RSG conducted a series of stated preference surveys throughout the I-405 Study Area. The primary purpose of the survey was to collect information from motorists to determine their willingness to pay tolls and their likelihood of using the express toll lanes. Specifically, the survey results were used to develop a distribution of values of time for motorists who either use or could use the proposed I-405 express toll lanes. The value of time distribution was used in the traffic model to evaluate the traffic demand for the express toll lanes and the level of tolls that motorists would likely pay in order to obtain savings in travel time on I-405 in the Study Area. The distribution of estimated values of time for I-405 motorists in the study area is shown in Figure ES-3. The sample exhibited a wide range of values of time, with a median value of time of $6.60 per hour for the entire sample. The top one percent of values of time among 24 participants is outside of the distribution shown in Figure ES-3, and those values are between $101 and $360 per hour. The average (mean) of the individual values of time was estimated at $11.87 per hour, or $0.20 per minute.

Figure ES-3
Distribution of Individual Values of Time



RSG also asked debriefing questions at the end of the stated preference surveys to find out how the survey participants felt about the described express toll lanes. All survey participants were asked to indicate their opinion of the described express toll lanes project. Figure ES-4 shows that 50.0 percent of all participants either strongly favored or somewhat favored the express toll lanes. Almost one-third of participants were opposed to the express toll lanes, and the remaining 17.2 percent were neutral.

Figure ES-4
Opinion of I-405 Express Toll Lanes Project
2,505 Respondents



MODELING METHODOLOGY

Three modeling approaches were used to analyze the I-405 express toll lanes:

- **Global Demand Estimates** – Global demand is an estimate of the amount of traffic using the I-405 corridor (both GP lanes and HOV lanes) under existing and improved conditions. The trip tables and models were originally developed by PSRC. The future year trip tables were modified due to recommended changes in the underlying socio-demographic data (population, number of households, and employment) made by an independent economic consulting firm, NEI.

- **Travel Time Simulation Model (VISSIM)** – a very detailed model of the I-405 corridor was developed using the VISSIM micro-simulation model. This model was used to develop a relationship between the travel speed on a section of GP lanes with a range of assumed traffic volumes on the GP lanes. This relationship, often referred to as a speed-flow curve, was developed for all the mainline sections on I-405 in the Study Area. The speed-flow curve is unique to each mainline section and reflects the unique geometry and traffic behaviors on that section. The speed-flow curve was a key input to the micro-model, and allowed the model to assign a travel speed on the GP lanes for each section of I-405 based on the volume of traffic on the GP lanes.

- **Market Share Micro-Model (Micro-Model)** - The market share micro-model estimates the share of traffic that would use the express toll lanes instead of the GP lanes or other alternate routes. The estimated amount of traffic using the express toll lanes is based on several factors including overall demand in the corridor; location of access points to the express toll lanes; values of time; excess capacity remaining in the express toll lanes that could be used by SOVs willing to pay a toll; and toll rates. The Micro-Model utilized the speed-flow curves developed in VISSIM for each mainline section of I-405 and specified toll rates to determine through an iterative process the equilibrium point between the toll rate for a trip (as a cost to the motorist) and the estimated savings to the motorist in time saved, which is interpreted as a dollar cost savings based on the value of time of the motorist.

Traffic assignments were run for 2010, 2014, 2020, and 2030. Nine time periods of the day, between 5 a.m. and 7 p.m., were modeled to reflect different congestion levels and travel patterns. It was assumed that express toll lanes would operate as a GP lane between 7 p.m. and 5 a.m. Toll sensitivity tests were conducted using the Micro-Model to determine the level of tolls needed to meet the traffic flow goals for the express toll lanes. A full range of toll rates were tested (from $0.05 per mile to more than $2.00 per mile) for each time period and travel direction. Tolls were selected that would best achieve a balance between the desired traffic flow of 1,500 vehicles per hour per lane or 1,600 vehicles per hour per lane, and the constraints on certain access ramps to the express toll lanes, specifically the access ramps that would serve traffic oriented to SR 522, NE 160th Street, and NE 128th Street.

ESTIMATED AVERAGE EXPRESS TOLL LANES TOLLS BY TIME PERIOD

WSA estimated the average toll rates that would be required to limit traffic flow in the express toll lanes to a maximum 1,500 vehicles per hour per lane in the I-405 Study Area that provides one express toll lane per direction, and to limit traffic flow to a maximum 1,600 vehicles per hour per lane in the I-405 Study Area that provides two express toll lanes per direction. These flow rates provide a minimum average travel speed of approximately 45 miles per hour.

The tolls were also developed to limit the express toll lane ingress or egress ramps to a maximum of approximately 1,350 vehicles per hour in order to reduce weaving between the express toll lanes and the GP lanes to an acceptable level. Relatively higher tolls (surcharges) were required on the ingress and egress express toll lane ramps that serve SR 522 and NE 160th Street traffic in order to achieve the 1,350 vehicles per hour goal. Surcharges were also imposed on the NE 128th Street direct access ramps. The surcharges were imposed to reduce traffic demand on the local arterial, NE 128th Street.

Average toll rates were developed for the following nine modeling time periods for 2010, 2014, 2020, and 2030:

1. AM 0: 5:00 to 5:30 AM;
2. AM 1: 5:30 to 6:30 AM;
3. AM 2: 6:30 to 8:30 AM;
4. AM 3: 8:30 to 9:30 AM;
5. MD 1: 9:30 AM to 2:30 PM;
6. PM 1: 2:30 to 3:30 PM;
7. PM 2: 3:30 to 5:30 PM;
8. PM 3: 5:30 to 6:30 PM; and
9. PM 4: 6:30 to 7:00 PM.

It was assumed for this study that a minimum toll rate would be set for any trip on the I-405 express toll lanes. The minimum toll was intended to cover the cost of toll collection. Minimum tolls, in current dollars, of $0.50, $0.60, $0.75 and $1.00 were assumed for 2010, 2014, 2020 and 2030, respectively. These increases are meant to account for inflation over time. Toll rates were never allowed to drop below these levels in this analysis.

Table ES-2 shows a summary of toll rates, by time period and direction, for two typical movements using the express toll lanes. Toll rates are shown for movements between SR 520 and SR 522 and between SR 522 and I-5. The rates shown in Table ES-2 reflect the estimated opening year (2010) rates and rates in the last year of the forecast period (2030). Toll rates for all possible express toll lane movements and for all assignment years (2010, 2014, 2020 and 2030) are provided in Appendix B of this report. All rates in Appendix B are provided in both current and constant 2007 values.

The toll rates shown in Table ES-2 are all in constant 2007 dollars. Toll rates tend to be highest during the morning peak (6:30-8:30 a.m.) in the southbound direction. Northbound tolls are highest in the evening, but at slightly different times depending upon the movement. For the movement between SR 520 and SR 522 the northbound evening peak toll rates occur between 3:30 and 5:30 p.m. Peak northbound evening rates shift to the next time period (5:30-6:30 p.m.) for movements between SR 522 and I-5.

In all cases, the peak period toll rates in Table ES-2 are greatest for movements between SR 522 and I-5, even though this represents a shorter distance than between SR 520 and SR 522. Rates are higher for the northern movement because this corresponds to the single express toll lane section of the project. Because only one lane of capacity is available, toll rates need to be much higher to restrict SOV buy in demand. It should be pointed out that, northbound evening toll rates remain relatively high through the assumed express toll lane tolling period (7:00 p.m.). For purposes of this study, after 7:00 p.m. the express toll lanes revert back to toll free GP lanes. This analysis suggests there may be a

need to extend express toll lane hours of operation beyond 7:00 p.m. in order to effectively manage demand.

Table ES-2
Examples of Estimated Average Weekday Toll Rates
In Constant 2007 Dollars (1)
I-405 Express Toll Lanes

Between SR 520 and SR 522

	2010		2030	
Time Period	Southbound	Northbound	Southbound	Northbound
5:00 - 5:30 a.m.	$0.46	$0.46	$0.57	$0.57
5:30 - 6:30 a.m.	0.46	0.46	1.36	0.57
6:30 - 8:30 a.m.	4.78	0.46	4.76	0.57
8:30 - 9:30 a.m.	1.76	0.46	3.83	0.57
9:30 a.m. - 2:30 p.m.	0.46	0.46	0.57	0.57
2:30 - 3:30 p.m.	0.46	1.53	0.57	4.25
3:30 - 5:30 p.m.	0.46	3.58	0.57	8.13
5:30 - 6:30 p.m.	0.46	4.18	1.67	7.59
6:30 - 7:00 p.m.	0.46	1.86	0.57	4.96

Between SR 522 and I-5 North

	2010		2030	
Time Period	Southbound	Northbound	Southbound	Northbound
5:00 - 5:30 a.m.	$0.46	$0.46	$0.57	$0.57
5:30 - 6:30 a.m.	0.46	0.46	2.35	0.57
6:30 - 8:30 a.m.	8.73	0.46	8.50	0.57
8:30 - 9:30 a.m.	1.76	0.46	4.25	0.57
9:30 a.m. - 2:30 p.m.	0.46	0.46	0.57	0.57
2:30 - 3:30 p.m.	0.46	0.84	0.57	3.49
3:30 - 5:30 p.m.	0.46	4.92	0.65	9.97
5:30 - 6:30 p.m.	0.70	5.71	6.38	11.22
6:30 - 7:00 p.m.	0.46	1.63	1.70	6.23

(1) Assumes a 2.5 percent annual discount rate.

ESTIMATED TRAFFIC AND GROSS TOLL REVENUE

Table ES-3 shows annual traffic and gross toll revenue for the Base Case Express Toll Lanes scenario. The traffic and revenue values developed for 2010, 2014, 2020 and 2030 are included, as well as values for all of the intermediate years developed by linear

interpolation between values for each of the four model years. These were developed using the modeling methodology described above and based on all of the toll rates shown in Table ES-2 and Appendix B.

As shown in Table ES-3, average weekday toll trips are estimated to increase from about 14,700 per day in 2010, to almost 30,600 by 2030. Total toll-free trips increase from approximately 59,500 to 71,700 over the same time period. The analysis shows that the vast majority of this growth over time occurs during non-peak hours. During morning and evening peak periods, the express toll lanes are estimated to be at or near capacity, even in 2010.

Ramp-up impacts have been factored into the first two years of operation. The ramp-up impacts are noted in the footnote to Table ES-3. As indicated, tolled traffic and revenue values were reduced by 30 percent in 2010 and by ten percent in 2011, to account for the time it will take motorists to become accustomed to the new travel options and technologies required to use them.

Annual gross toll revenue forecasts are expressed both in terms of current and constant 2007 dollars. As shown in the final column of Table ES-3, over the 20 year forecast period, annual gross toll revenue is estimated to total nearly $236.8 million in constant 2007 dollars. The average annual rate of toll revenue growth over this time period amounts to 6.6 percent in current dollars and by 4.0 percent in constant dollars. Of that growth, about 3.7 percentage points are accounted for by the growth in tolled traffic and the remaining growth is accounted for by increases in the average toll rate.

Similar analyses were conducted for each of the three sensitivity scenarios that were tested as part of this study. Table ES-4 summarizes the estimated annual gross toll revenue for the Base Case, as well as the three alternate scenarios. All of the values in Table ES-4 are in constant 2007 dollars.

A summary of the estimated annual gross toll revenue for the Base Case as well as the three alternative scenarios is provided in Table ES-4. Gross toll revenue values are shown for 2010, 2020 and 2030, as well as the cumulative revenue over the 20 year forecast period.

As would be expected, eliminating toll paying SOV traffic from the NE 128th Street interchange (Sensitivity Test One) generates less gross toll revenue than the Base Case. Total cumulative annual gross toll revenue in constant 2007 dollars amounts to $225.0

Table ES-3
Estimated Base Case I-405 Express Toll Lane Traffic and Gross Toll Revenue

Annual Revenue in Thousands of Current and Constant (2007) Dollars

		Average Weekday Trips			Current	Average	Constant
		Toll	Toll-Free	Total	Annual Toll	Weekday	Annual Toll
Year		Trips	Trips	Trips	Revenue (2)	Toll	Revenue (3)
2010	(1)	14,685	59,451	74,136	$6,663	$1.80	$6,188
2011	(1)	19,261	59,916	79,176	9,123	1.88	8,265
2012		21,832	60,384	82,216	10,794	1.96	9,541
2013		22,272	60,856	83,128	11,495	2.05	9,912
2014		22,721	61,332	84,053	12,240	2.14	10,297
2015		23,469	61,782	85,251	12,805	2.16	10,510
2016		24,242	62,234	86,477	13,396	2.19	10,726
2017		25,041	62,690	87,731	14,014	2.22	10,947
2018		25,865	63,150	89,015	14,660	2.25	11,173
2019		26,717	63,613	90,330	15,336	2.28	11,403
2020		27,597	64,079	91,676	16,044	2.30	11,638
2021		27,881	64,800	92,681	16,686	2.37	11,809
2022		28,167	65,530	93,697	17,355	2.44	11,983
2023		28,457	66,267	94,724	18,050	2.51	12,159
2024		28,749	67,013	95,763	18,773	2.59	12,338
2025		29,045	67,768	96,812	19,525	2.66	12,519
2026		29,343	68,531	97,874	20,307	2.74	12,703
2027		29,645	69,302	98,947	21,121	2.82	12,889
2028		29,949	70,082	100,032	21,967	2.91	13,079
2029		30,257	70,871	101,128	22,846	2.99	13,271
2030		30,568	71,669	102,237	23,762	3.08	13,466
Cumulative Revenue							**$236,815**

(1) Ramp-up adjustment factors are applied to tolled transactions and revenue for the first two years of operation. Adjustment factors for 2010 and 2011 are as follows: 2010 - 70% and 2011 - 90%.

(2) For the development of annual toll revenue, a nominal amount equal to 2 percent of average weekday toll revenue was added for each weekend day.

(3) This column represents the annual revenue stream in constant 2007 dollars, assuming a 2.5 percent annual discount rate.

Table ES-4
Summary of I-405 Express Toll Lanes Gross Toll Revenue

Annual Revenue in Thousands of Constant 2007 Dollars(1)

Year	Base Case Annual Toll Revenue	Sensitivity Test One Annual Toll Revenue (3)	Sensitivity Test Two Annual Toll Revenue (4)	Sensitivity Test Three Annual Toll Revenue (5)
2010 (2)	$6,188	$5,904	$6,330	$6,046
2020	11,638	11,080	11,809	11,250
2030	13,466	12,687	13,684	12,905
Cumulative Revenue from 2010 to 2030	$236,815	$224,988	$240,936	$229,109
Variance from Base Case	$0	($11,827)	$4,121	($7,706)

(1) Assumes a 2.5 percent annual inflation rate from 2010 to 2030.
(2) Ramp-up adjustment factors are applied to transactions and revenue for the first two years of operation. Adjustment factors for 2010 and 2011 are as follows: 2010 - 70% and 2011 - 90%
(3) Sensitivity Test One assumes SOV traffic is prohibited from using the 128th Street direct access ramps.
(4) Sensitivity Test Two assumes extension of the express toll lanes south to include access to and from the north at the NE 6th Street ramps.
(5) Sensitivity Test Three reflects a combination of banning SOV trips from 128th Street and extending express toll lane access to NE 6th Street.

million; this represents about $11.8 million (5 percent) less cumulative gross toll revenue than the Base Case.

Extending the express toll lanes to the NE 6th Street direct access ramps (Sensitivity Test Two) results in greater gross toll revenue than is generated in the Base Case. Total cumulative annual gross toll revenue in constant 2007 dollars amounts to $240.9 million; this represents about $4.1 million (1.7 percent) more cumulative gross toll revenue than the Base Case.

The combined effect of eliminating toll paying SOV traffic from the NE 128th Street interchange and extending the express toll lanes to NE 6th Street (Sensitivity Test Three) generates less gross toll revenue than the Base Case. Total cumulative annual gross toll revenue in constant 2007 dollars amounts to $229.1 million; this represents about $7.7 million (3.3 percent) less cumulative gross toll revenue than the Base Case.

OBSERVATIONS ON I-405 EXPRESS TOLL LANES

This section addresses some observations on express toll lane performance characteristics in the following areas:

- Express toll lane mainline and access point operations;
- SOV response to tolling during congested peak periods; and
- Peak period spread of express toll lane demand.

EXPRESS TOLL LANES MAINLINE AND ACCESS POINT OPERATIONS

In the course of developing the estimated traffic and toll rates for the express toll lanes, WSA, with the assistance of WSDOT, observed certain conditions that caused the express toll lanes to operate without meeting their proposed operating conditions. As discussed in Chapter 5, Toll Rate Framework, Page 5-9, WSA developed average toll rates (base toll rates) that resulted in achieving a maximum target flow of 1,500 or 1,600 vehicles per hour per lane in the express toll lanes, for a single express toll lane or dual express toll lane section, respectively.

Achieving this target flow rate is important because it benefits both the express toll lanes and the GP lanes for the following reasons:

1. The target flow rates permit express toll lanes traffic to travel at an average speed of approximately 45 miles per hour and maximize the usage of the express toll lanes.

2. The target flow rates result in the largest amount of traffic from the GP lanes to the express toll lanes, potentially improving GP lane conditions.

Once the base toll rates were established that optimized conditions on the express toll lane mainline segments, an operational analysis was conducted by WSDOT to determine how the express toll lane ingress and egress points operated. WSA provided trip table information to WSDOT for input into the VISSIM operational model. WSDOT determined that during certain time periods, traffic entering or exiting the express toll lanes to access SR 522 and NE 160th Street were high enough to cause significant weave and merge problems on the GP lanes. WSDOT also determined that the express toll lane traffic demand was too high to be accommodated on the local street network that feeds NE 128th Street. These problems occurred during morning and evening weekday commuting periods.

In order to reduce demand at these express toll lane access points, express toll lane traffic demand was reduced by raising tolls over the base toll rate for use of those access points. The increased toll "surcharge" was applied to the access points only during time periods when the demand on the access ramps created the observed operational problems on the GP lanes or the arterial. The surcharges resulted in decreased demand for the express toll lanes and improved operation at the access points. It also resulted in less efficient use of the GP lanes.

The net effect of reducing express toll lane demand on the SR 522, NE 160th Street, and NE 128th Street access ramps was to reduce express toll lane traffic flow below the target flow rate. Under ideal conditions, toll rates would decrease in other locations to allow more through trips to use the available capacity. This solution was often limited because the single lane section of express toll lanes (north of 160th Street to I-5) was often over capacity and therefore no more through trips could be accommodated on the I-405 express toll lanes.

These observations show that in order to maximize the efficiency of the I-405 express toll lanes, several improvements or combinations of improvements could be evaluated, including:

- The provision of direct access ramps that would accommodate traffic from SR 522 and/or NE160th Street,
- Roadway capacity improvements to NE 128th Street,
- Capacity improvements to I-405 between NE 160th Street and I-5.

SOV Response To Tolling During Congested Peak Periods

During the most congested time periods of the day, particularly in future years, such as 2020 and 2030, traffic demand for the express toll lanes becomes very high. During these congested time periods, the express toll lanes often have very little capacity left for SOVs to purchase. At the same time there is a population of motorists with high values of time who are willing to pay large tolls for the remaining capacity in the express toll lanes. The SOV motorists become relatively insensitive to toll increases; therefore toll increases have increasingly little ability to influence their decision to buy into the express toll lanes. This

brings up several policy decisions including whether to cap toll rates, the level at which they should be capped, or the possible temporary restriction of the express toll lanes to HOVs.

The major constraint to SOV buy-in occurs in the northern section where only a single express toll lane is available in each direction. The HOV demand significantly limits the ability of SOVs to buy into the express toll lanes during peak periods, particularly in the single-express toll lane section. For example, in 2020 in the southbound direction on the express toll lane south of NE 195th Street, in the A.M. peak period (6:30 – 8:30 A.M.), there is only the capacity for about 200 SOVs to buy into the express toll lanes per hour. The rest of the space is filled by HOVs. In the same location in the southbound direction, during the P.M. peak period (3:30 – 6:30 P.M.), there is only room for about 130 SOVs to buy into the express toll lanes each hour. The single lane section acts as a major constraint to accommodate SOVs into the express toll lanes.

Peak Period Spread Of Express Toll Lane Demand

A final observation has to do with the assumed hours of express toll lane operation. In this study, express toll lane operation reverted to toll-free GP lane operation after 7:00 p.m. Relatively high toll rates were required during the 6:30-7:00 p.m. analysis period in order to maintain free flow express toll lane conditions. This would suggest that additional traffic management through tolling may be required beyond 7:00 p.m. This would have the duel benefit of improved overall traffic flow after 7:00 p.m. and additional toll revenue generated by the express toll lanes.

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CHAPTER 1
INTRODUCTION

I-405 was constructed in the early 1960s as a bypass around Seattle. Today, it is the major north-south travel route east of I-5. As I-5 became too congested to act as a reliable designated military route, I-405 assumed this role as well. Continued high rates of economic growth east of Lake Washington have resulted in traffic congestion on I-405 rivaling that of I-5. State officials recognize that in addition to the frustration experienced by motorists who use I-405 daily, the congestion stifles continued economic growth by increasing travel times and generally reducing transportation reliability. Without improvements, future congestion will grow exponentially, further impacting the economy, the environment, and the general "quality of life" for those traveling on and living near the I-405 corridor.

LEGISLATIVE ACTION AND STUDY DEFINITION

In 1999, the Washington State Department of Transportation (WSDOT) began a 20-year planning effort for I-405. WSDOT prepared an Environmental Impact Statement and issued a federal record of decision and preferred alternative in the fall of 2002. In the I-405 Environmental Impact Statement, managed lanes were identified as part of the solution for congestion relief.

The Washington State Legislature passed Senate Bill 6091 during the 2005 session which called for consideration of managed lanes along I-405. The bill states, "The legislature intends that tolls be charged to offset or partially offset the costs for…widening of Interstate 405 including a managed lanes concept." This same bill also enacted a statewide study to examine tolling around Washington State, including the I-405 corridor, and called for tolls to be considered on other major WSDOT projects.

Legislative focus on tolling has continued into the 2007 Regular Session. Engrossed Substitute House Bill 1095, Section 605, states:

Based on the anticipated outcomes of the tolling study, to be conducted under section 206 of this act, the legislature intends that tolls be charged to offset or partially offset the

costs for the following projects, and that a managed lane concept be applied in their design and implementation: State Route 520 Bridge replacement and HOV project, and widening of Interstate 405.

As a result of Senate Bill 6091, Wilbur Smith Associates (WSA) was hired to analyze the traffic and revenue impacts of implementing a specific variation of the managed lane concept called Express Toll Lanes. While the legislation called for consideration of managed lanes along the length of I-405, this study considers only a 15-mile section from SR-520 north to I-5 (Study Area), as shown in Figure 1-1. The project corridor includes portions of King and Snohomish counties.

In this study, an express toll lane is a high occupancy vehicle (HOV) lane that allows vehicles with lower occupancy to have access to it by paying a toll. The amount of the toll would vary by traffic demand. A basic assumption of this study is that HOVs would continue to use the express toll lanes toll-free. To maintain a desired level of service in the express toll lanes, the toll for single occupant vehicles (SOVs) would be dynamically adjusted to control the number of SOVs willing to buy into the express toll lanes. Revenue generated from the express toll lanes can be used to help offset the cost of planned corridor improvements.

Express toll lanes would allow WSDOT to provide a reliable travel alternative for motorists who need a faster travel option, and HOVs could continue to use the Express Toll Lanes toll-free. Some SOV motorists may be willing to pay the toll for every trip because it saves time. In most cases, SOV motorists would use the express toll lanes occasionally, taking advantage of the faster travel conditions only on those particular occasions when use of the general purpose lanes would not allow them to reach their destination on time.

WSA was directed by WSDOT to conduct the study at an *investment level*. This means the study is of sufficient detail and level of effort to use for financing decisions. This level of effort includes an independent demographic and land-use analysis of the study corridor, the conduct of stated preference surveys to determine values of time for potential express toll lane patrons, and extensive detailed modeling to estimate the potential traffic and toll revenue, as well as operating conditions, associated with the express toll lanes.

PROJECT DESCRIPTION

The I-405, SR 520 to I-5 Widening Project will be built using the Nickel and Transportation Partnership Account (TPA) funds. The project will improve 15 miles of highway, extending from Milepost (MP) 15.0 to MP 30.0 at Interstate 5. Construction will include building an additional lane in each direction between SR 520 and SR 522, an

additional northbound lane from NE 195th Street to SR 527 in Bothell, and an improved NE 116th Street interchange. The project will also construct a braid that will separate the northbound off-ramp to SR 522 and the northbound on-ramp from NE 160th Street. The new lane between SR 520 and SR 522 and the existing HOV lane through this section will operate as two express toll lanes flowing in each direction. The existing HOV lane north of SR 522 will be converted to a single express toll lane, also flowing in each direction.

Figure 1-2 provides a visual representation of the single-lane and two-lane express toll lane sections, as well as the proposed express toll lane access locations. The MP positions shown in this diagram are approximations only: actual MPs will vary slightly for northbound and southbound access points. The locations of the access points to and from the express toll lanes were based on several factors including:

- Providing convenient access to high-demand travel movements,
- Accommodating existing transit and HOV travel patterns and demand,
- Adhering to physical and topographical constraints, and
- Ensuring adequate spacing between access points and between access points and interchange locations to promote efficient traffic flow.

Access to the express toll lanes will be provided at each end of the project and at six intermediate points northbound and seven intermediate points southbound. Unlike today when HOVs can enter and exit the HOV lanes at any location, express toll lane access will be limited to the specified access points. Most access will be via the I-405 GP lanes. These locations are indicated by black arrows in Figure 1-2. A specialized access called *direct access* will be provided at NE 128th Street. This access is currently under construction. A direct access point allows traffic to enter the existing HOV lane or proposed express toll lanes directly from the arterial instead of the I-405 GP lanes. The direct access point is indicated by a green diamond in Figure 1-2.

In summary, there will be a total of eight northbound access points, consisting of two at the ends of the project, and six intermediate points. The six intermediate access points consist of five accesses via the I-405 GP lanes and one direct access at NE 128th Street. In the southbound direction, there will be nine access points; two at the ends of the project and seven intermediate points. The seven intermediate points consist of six accesses via the I-405 GP lanes and one direct access at NE 128th Street.

Access points at MP 16.0, 19.0, 20.7, 25.5 and 28.0 will permit motorists to enter and exit the express toll lanes. The access point at MP 21.5 will only permit northbound exits and southbound entries to the express toll lanes. The access at MP 22.6 will only permit a southbound entry to the express toll lanes. At MP 15.0, the southern endpoint of the project, motorists may enter the express toll lanes northbound and exit the express toll lanes southbound. At MP 30.0, the northern terminus of the project, southbound

motorists may enter the express toll lanes and northbound motorists may exit the express toll lanes.

In this study, the entry access points to the express toll lanes will be called ingress ramps, and the exit access points from the express toll lanes to the GP lanes will be called egress ramps, to distinguish them from ramps entering and exiting the I-405 GP lanes. The northbound egress ramp at MP 21.5 serves traffic traveling to both NE 160th Street and SR 522. In the southbound direction, separate ingress points are provided for NE 160th Street (MP 21.5) and SR 522 (MP 22.6).

The configuration shown in Figure 1-2 is considered the Base Case scenario for this study. WSDOT directed WSA to conduct the following three sensitivity tests of the Base Case:

- The first sensitivity test excludes SOVs from using the NE 128th St Direct Access to and from I-405. The direct access connection was built by Sound Transit and approved by FHWA with the restriction that the ramps are for HOV and transit vehicles only.
- A second sensitivity test extends the express toll lane system to NE 6th Street in Bellevue. The TPA-funded Northbound NE 8th St to SR 520 Braided Crossing Project in Bellevue includes necessary upgrades to I-405 that would allow for express toll lane operations. This project is scheduled to be completed after the SR 520 to I-5 project.
- The third sensitivity test determines the combined effect of excluding SOVs from the NE 128th St Direct Access with extending the system to NE 6th St.

Estimated traffic and revenue forecasts are provided for the Base Case and the three sensitivity tests. The Base Case and sensitivity tests assumed 2010 as the opening year. Traffic forecasts and gross annual toll revenues were developed for a 20-year forecast period ending in 2030.

THE EXPRESS TOLL LANE TOLLING CONCEPT

There are many variations of the express toll lane concept in operation in the United States. Some variables include hours of operation, definition of toll versus toll-free vehicles, and the number of intermediate access points. A basic assumption of this study was that the express toll lane hours of operation would remain unchanged from current HOV hours of operation (between 5 a.m. and 7 p.m.). Outside of those hours, the express toll lanes would be open to all motorists, toll-free. Ultimately, however, it may be determined that different express toll lane hours of operation should be implemented.

For this study, an HOV is defined as a passenger or light commercial vehicle with two or more occupants (HOV 2+). This is consistent with WSDOT's current HOV definition. In this study, an HOV 2+ would be allowed to use the express toll lanes toll-free. This is only an assumption; if express toll lanes are implemented on I-405, the definition of an HOV may be different.

The HOV 2+ assumption is very important. If the definition is changed from HOV 2+ to vehicles with three or more occupants (HOV 3+), the ability of SOVs to buy into the express toll lanes would likely be significantly increased, resulting in more toll paying vehicles and theoretically a better ability for WSDOT to manage traffic on the express toll lanes through tolling. There are large implications in changing the definition of an HOV, and if express toll lanes are implemented on I-405, the definition of toll-free vehicles would likely be re-evaluated by WSDOT.

Some express toll lane facilities minimize or eliminate intermediate access points. As shown in Figure 1-2, the proposed concept for I-405 would continue to permit most major movements currently available to HOV motorists.

One characteristic common to all express toll lanes is the ability to vary toll rates in order to maintain free-flow conditions. Roadway detectors will monitor congestion levels in both the express toll lanes and the general purpose lanes. Electronic signs will be placed in advance of each express toll lane entry location. These will display the current toll necessary to maintain acceptable travel speeds in the express toll lanes. Single occupant vehicles will be required to open an account and place a "Good to Go!" transponder in their windshield. When they decide to use the express toll lanes, the toll will be automatically deducted from their account. The motorist will not be required to stop at a toll plaza or to slow down. The toll will be paid at normal highway speed, with no traditional toll plazas or the need to stop or slow down.

MODELING BACKGROUND INFORMATION

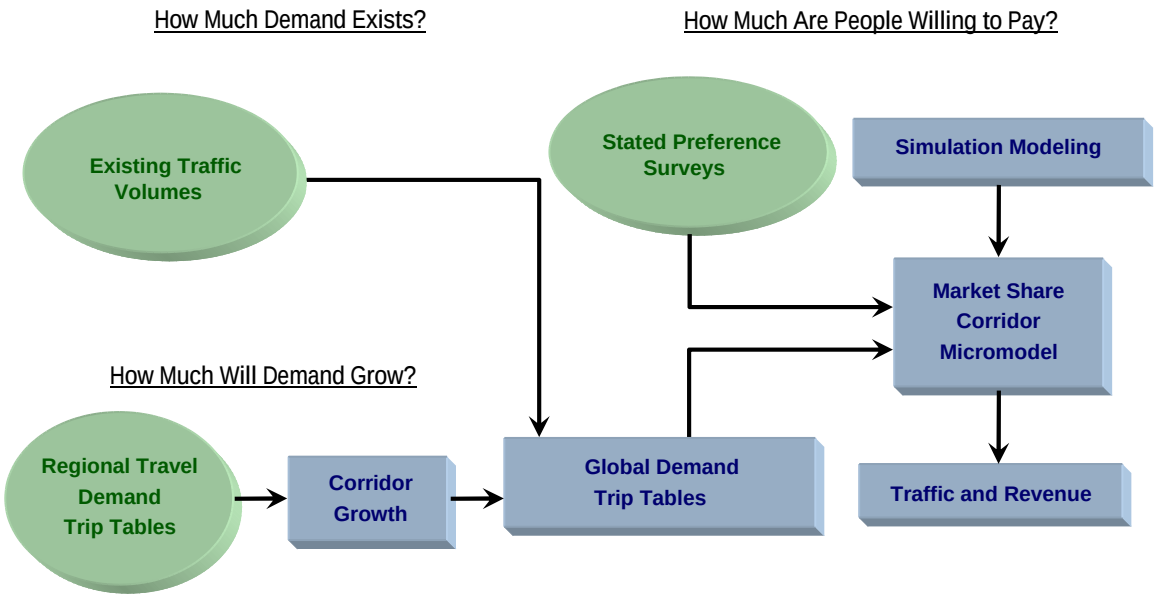
WSA worked closely with a group of WSDOT employees who came together specifically to analyze improvements in the I-405 corridor, including potential express toll lanes (I-405 Team). Prior to WSA's involvement, the I-405 Team spent considerable effort analyzing the potential impacts of the proposed improvement program, but assumed that all additional capacity would be constructed as traditional HOV lanes. This analysis was used as input to the Environmental Impact Statement for the HOV lane scenario.

The underlying traffic model used by the I-405 Team was developed by the Puget Sound Regional Council. Working together with Mirai Associates, the I-405 Team made some minor modifications to calibrate the model to the I-405 corridor more accurately, and to acknowledge all of the proposed corridor improvements and capacity constraints.

WSA used the same traffic model as a starting point for its analysis of the express toll lanes, and hired Northern Economics, Inc. to perform an independent economic review of the model. Northern Economics, Inc. reviewed the underlying socio-demographic forecasts within the Study Area, and recommended modifications to the model in the areas of future year population, employment, and number of households. Based on this review, slight modifications were made to future year trip tables.

Figure 1-3 provides a simplified overview of the modeling process used to estimate the traffic toll revenue potential for express toll lanes on I-405. As shown, the modeling process seeks to answer three basic questions: How much demand currently exists in the corridor? How much will that demand grow over time? And, how much are people willing to pay for free-flow travel in the express toll lanes? A much more detailed description of the modeling process is provided in Chapter 5 (Modeling Approach, page 5-1).

Figure 1-3
Simplified Study Methodology Flow Chart



REPORT STRUCTURE

The following five chapters are included in this study:

CHAPTER 1: INTRODUCTION

Chapter 1 defines the goals of this study, and the legislative action that made it possible. A brief description of the I-405 express toll lanes project is provided, as well as a summary of how the express toll lanes will operate in this corridor.

CHAPTER 2: EXISTING I-405 OPERATING PROFILE

Chapter 2 highlights existing traffic volumes and travel conditions in the I-405 corridor. Average daily and hourly traffic volume profiles are described, as well as average travel speeds. This information was instrumental in calibrating the traffic model to current year conditions.

CHAPTER 3: SOCIO-DEMOGRAPHIC ANALYSIS

WSA retained the services of Northern Economics, Inc. to conduct an independent economic review of the model and the underlying socio-demographic forecasts within the Study Area, and make recommended modifications to the model in the areas of future year population, employment, and number of households. They recommended changes to the forecast years in small geographic units called traffic analysis zones. The recommendations were based on extensive research of current development plans and socio-demographic data that were not available to the Puget Sound Regional Council at the time of their last forecast. In addition to the information provided in this chapter, Northern Economics, Inc. developed a separate document summarizing its work effort.

CHAPTER 4: STATED PREFERENCE SURVEY

WSA also retained the services of Resource Systems Group, Inc. to conduct market research analysis in the I-405 corridor. Resource Systems Group, Inc. conducted 2,592 interviews through a combination of internet and direct intercept based surveys in order to develop corridor specific values of time. These surveys were used as input for the toll diversion model developed for this study, and they highlighted important information regarding attitudes and reactions of motorists toward the concept of express toll lanes on I-405. In addition to the information provided in this chapter, Resource Systems Group, Inc. developed a separate document summarizing their work effort.

CHAPTER 5: ESTIMATED TRAFFIC AND TOLL REVENUE

Chapter 5 summarizes the overall modeling process used to develop estimated traffic and gross annual toll revenue resulting from express toll lanes along I-405. It includes a description of key modeling inputs, as well as an outline of the basic assumptions used in the analysis. Detailed express toll lane traffic forecasts are provided by time period for each model year tested (2010, 2014, 2020 and 2030). All toll rates are presented in tabular format for each model year and time period. Finally, annual estimates of express

toll lane traffic and gross annual toll revenue are presented for the years 2010 to 2030. These are developed for the Base Case and for each of the three sensitivity tests.

CHAPTER 2

EXISTING I-405 OPERATING PROFILE

Wilbur Smith Associates (WSA) used an existing 2005 traffic model and trip tables as a starting point for the analysis of the proposed I-405 express toll lanes. The model and trip tables, originally developed by the Puget Sound Regional Council (PSRC), have been modified by the Washington State Department of Transportation (WSDOT) to more accurately reflect traffic volumes on specific ramps and mainline sections.

WSA verified the WSDOT/PSRC 2005 model and trip tables by developing its own 2005 operating profile of I-405 in the Study Area, and comparing the profile to output from the WSDOT/PSRC model. As part of the verification process, WSA obtained existing traffic counts from WSDOT, and conducted travel time studies on I-405 in the Study Area. The goal of the data collection and resulting operating profile was to verify that the WSDOT/PSRC 2005 model and trip tables served as a satisfactory base to develop future year traffic models.

This Chapter presents a summary of the operating profile of I-405 as developed by WSA based on traffic data from WSDOT, and travel time studies conducted by WSA. The conclusion, as stated at the end of this chapter, is that the 2005 WSDOT/PSRC model reflects the operating characteristics of I-405 in the Study Area, and thus is an appropriate tool to use for the analysis of potential express toll lanes.

This chapter consists of the following sections:

- **Estimated Average Annual Weekday Traffic (AAWDT)** – WSA developed a balanced 2005 average weekday traffic profile for I-405 between SR 520 north to I-5. The profile includes mainlines and individual ramps by direction.

- **Monthly Traffic Variations** – Presents monthly traffic variations on I-405 in the Study Area for 2005.

- **Daily Traffic Variations** – Presents daily traffic variations on I-405 in the Study Area for 2005.

- **Hourly Traffic Variations –** Presents hourly traffic variations for a weekday and weekend day on I-405 in the Study Area for 2005.

- **General Purpose (GP) and High Occupancy Vehicle (HOV) Lane Profile** – Presents hourly traffic volumes by lane type for weekday traffic on I-405 in the Study Area for 2005.

- **Vehicle Class Distribution** – Presents the vehicle class distribution for an average weekday and weekend day in 2005 on I-405.

- **Travel Speed Profile** – Presents the results of travel time studies on I-405 in the Study Area for June 2006.

- **Historic Traffic Growth** – Summarizes recent growth trends in traffic on I-405 in the Study Area from 1999 to 2005.

- **Application of the Data Collection Effort** – Summarizes how the I-405 operating profile was used in the study.

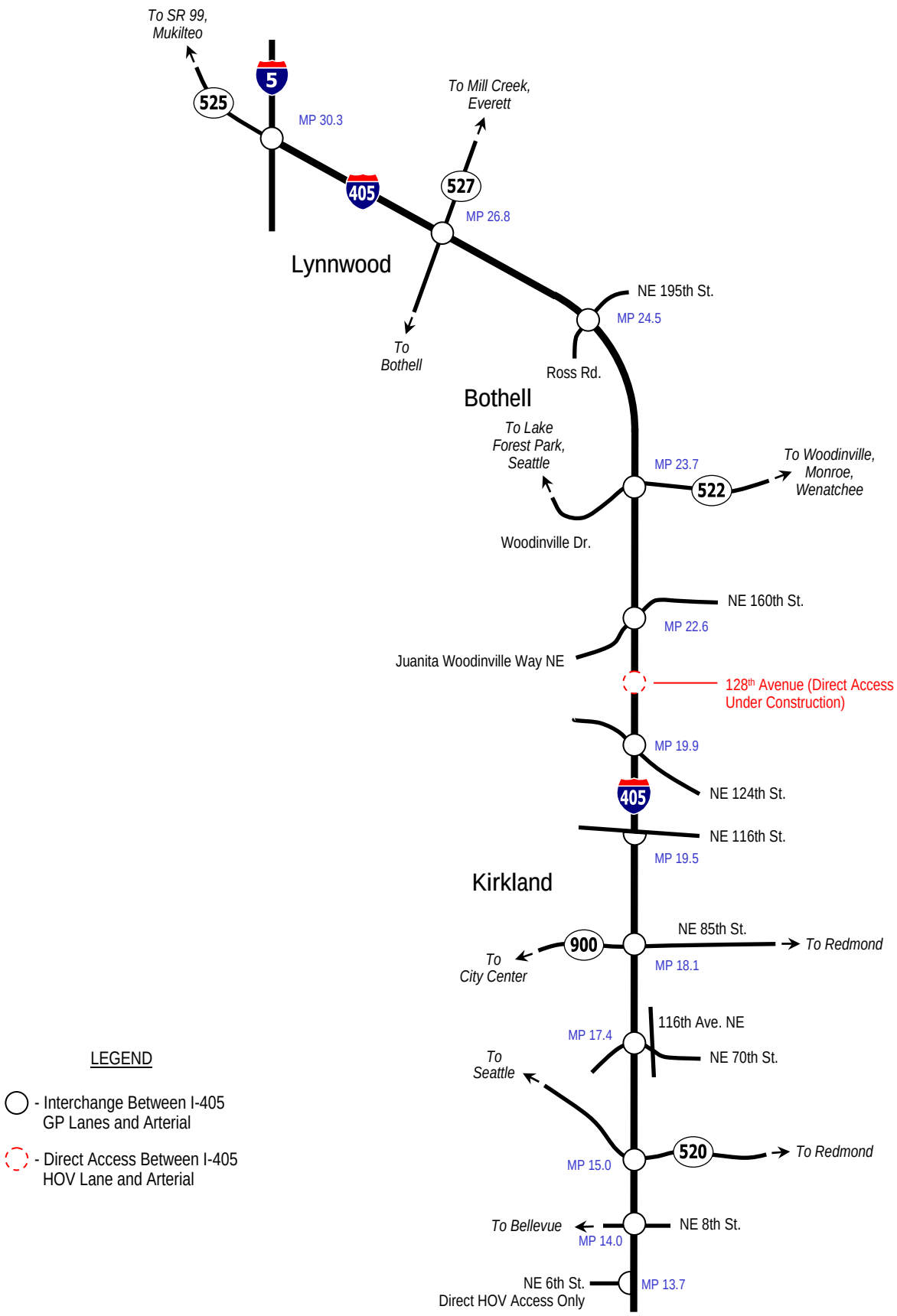
ESTIMATED AVERAGE ANNUAL WEEKDAY TRAFFIC

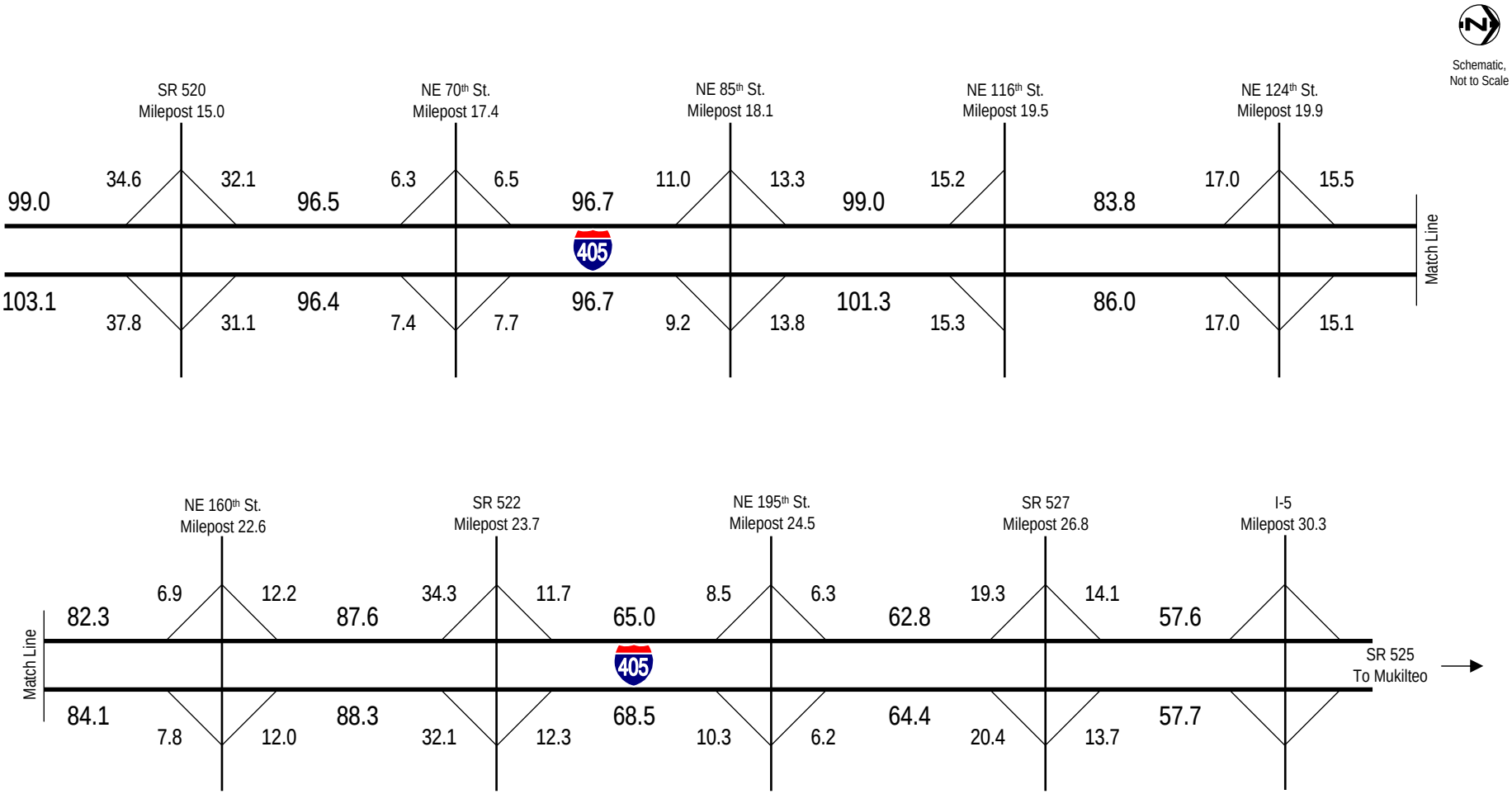
Estimated AAWDT volumes on I-405 for the Study Area in 2005 are presented in this section. WSA developed a balanced traffic profile of the Study Area, based on the Washington Department of Transportation traffic counts published in the 2004 and 2006 *Ramp and Roadway Report* (Northwest Region – Traffic Systems Management Center). The traffic volumes in the balanced profile were used to confirm the assigned 2005 AAWDT volumes from the WSDOT/PSRC 2005 model.

Figure 2-1 illustrates the interchange locations in the Study Area in 2005. Figure 2-2 is a schematic that shows the WSA estimated AAWDT on the mainline sections and ramps in the Study Area. The estimated traffic volumes, which are based on WSDOT traffic counts, represent traffic volumes on the mainline lanes and ramps, including HOV lanes.

In 2005, four continuous mainline lanes were provided in each direction on I-405 north of SR 520 to the SR 522 interchange consisting of three GP lanes and one HOV lane. HOV lane usage was restricted to light two-axle vehicles with two-or-more occupants between the hours of 5 a.m. to 7 p.m., seven days a week. From 7 p.m. to 5 a.m., all vehicles were permitted to use the HOV lanes. The section of I-405 from SR 522 north to I-5 consisted of three continuous lanes in each direction, including one HOV lane.

Figure 2-2 shows that the 2005 AAWDT in the four-lane mainline sections of I-405 ranged from a high of 192,900 just north of SR 520 to a low of 166,400 between the NE 124th Street and the NE 160th Street interchanges. On the three-lane mainline sections,


Schematic, Not to Scale
To SR 99, Mukilteo
525
5
MP 30.3
To Mill Creek, Everett
405
527
MP 26.8
Lynnwood
To Bothell
NE 195th St.
MP 24.5
Ross Rd.
Bothell
To Lake Forest Park, Seattle
MP 23.7
522
To Woodinville, Monroe, Wenatchee
Woodinville Dr.
NE 160th St.
MP 22.6
Juanita Woodinville Way NE
128th Avenue (Direct Access Under Construction)
MP 19.9
405
NE 124th St.
NE 116th St.
MP 19.5
Kirkland
NE 85th St.
900
To Redmond
To City Center
MP 18.1
MP 17.4
116th Ave. NE
NE 70th St.
To Seattle
520
To Redmond
MP 15.0
To Bellevue
NE 8th St.
MP 14.0
NE 6th St.
Direct HOV Access Only
MP 13.7
LEGEND
- Interchange Between I-405 GP Lanes and Arterial
- Direct Access Between I-405 HOV Lane and Arterial



LEGEND

87.6 – 2005 total traffic on an average weekday in thousands.

Includes traffic on general purpose (GP) lanes and HOV lanes.

Source: Based on WSDOT traffic data published in the 2004 and 2006 *Ramp and Roadway Report*.

WilburSmith ASSOCIATES

2005 ESTIMATED AVERAGE WEEKDAY TRAFFIC (AWDT)

FIGURE 2-2

the 2005 AAWDT ranged from a high of 133,500 north of SR 522 to 115,300 south of I-5.

The interchanges with the highest traffic demand can also be seen in Figure 2-2. Excluding the I-5 interchange, the ramps that had the highest weekday traffic demand in 2005 were SR 520, which accommodated 135,600 vehicles on an average weekday, followed by SR 522, with an AAWDT of 90,400. The SR 527 interchange and the NE 124th Street interchange accommodated 67,500 and 64,600 vehicles respectively, per average weekday in 2005.

MONTHLY TRAFFIC VARIATIONS

The following three mainline locations along I-405 were selected to illustrate the seasonal traffic patterns on I-405 in the Study Area:

1. South of Mile Post (MP) 19.5, NE 116th Street;
2. South of MP 22.6, NE 160th Street; and
3. South of MP 26.8, SR 527.

The 2005 Average Daily Traffic (ADT) by month was developed and compared to the 2005 Average Annual Daily Traffic (AADT) to determine the monthly traffic variations. The monthly profiles for the locations listed above are shown in Figures 2-3 through 2-5, respectively. At all three locations, daily traffic demand peaked in the summer months of June, July and August. March, April, May, and September generally represent "typical" or "average" daily traffic demand. January consistently had the lowest average daily traffic demand.

Figure 2-3 shows the monthly variations in ADTs for the mainline section south of MP 19.5, NE 116th Street. Average daily traffic volumes in June and August were six percent higher than the 2005 AADT. February, March, April, May, and September all had ADTs close to the 2005 AADT. January's ADT was six percent less than the 2005 AADT.

Figure 2-4 shows monthly variations in ADTs by month for the mainline section south of MP 22.6, NE 160th Street. June's ADT was seven percent higher than the 2005 AADT. July and August had daily traffic demand six percent higher than the average day in 2005. Daily traffic demand was eight percent less in January than the average day in 2005.

Figure 2-5 shows the monthly variations in ADTs by month for the northern mainline section south of MP 26.8, SR 527. Traffic demand peaked in the summer months, totaling seven percent more average daily traffic in June and August, compared to the

Figure 2-3
2005 I-405 Monthly Traffic Variations
Mainline (GP and HOV Lanes) South of Milepost 19.5 - NE 116th Street

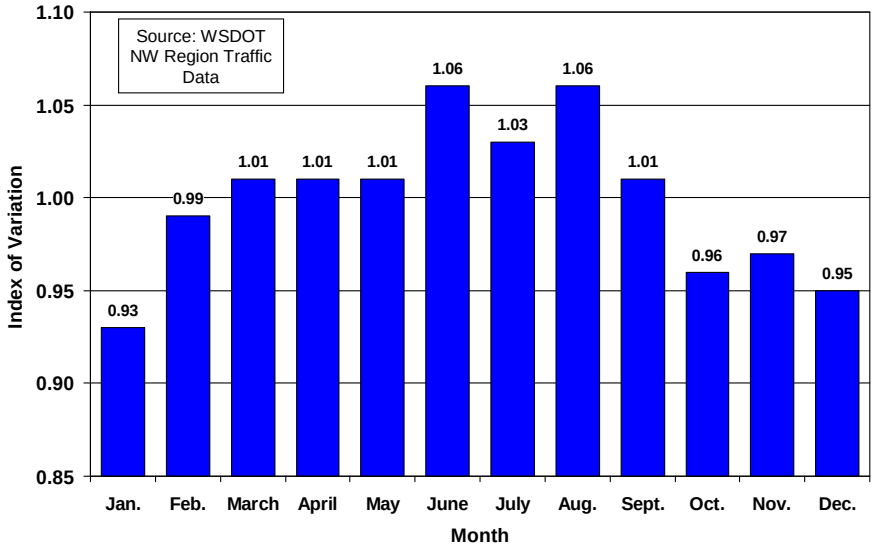


Figure 2-4
2005 I-405 Monthly Traffic Variations
Mainline (GP and HOV Lanes) South of Milepost 22.6 - NE 160th Street

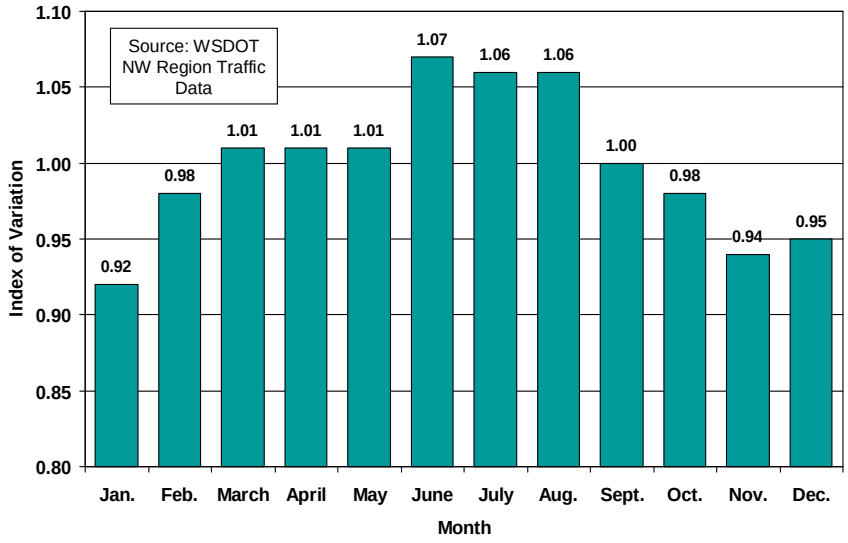
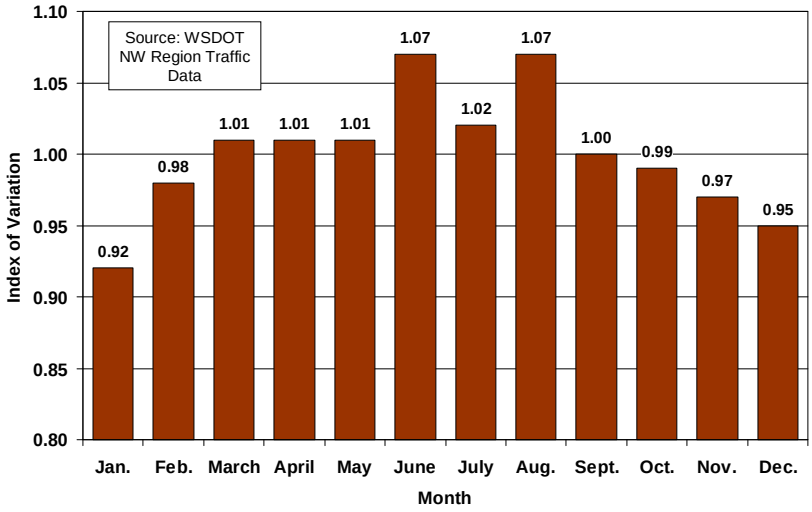


Figure 2-5
2005 I-405 Monthly Traffic Variations
Mainline (GP and HOV Lanes) South of Milepost 26.8 - SR 527



average day in 2005. December's average daily traffic was five percent less, and January's traffic was eight percent less than the 2005 AADT.

DAILY TRAFFIC VARIATIONS

Daily traffic patterns were consistent by time of year and at various locations on I-405. Table 2-1 and Figure 2-6 illustrate observed daily variations on the mainline section of I-405 south of MP 19.5, NE 116th Street, in March and July of 2005. The data shows that Thursdays and Fridays consistently had the highest traffic volumes, and that Saturdays and Sundays had the lowest volumes, followed by Mondays.

Table 2-1
I-405 - 2005 Daily Traffic Variations
South of Milepost 19.5, NE 116th St.

Day	Indices of Daily Traffic Variations	
	March (1)	July (2)
Sunday	0.75	0.80
Monday	1.02	0.94
Tuesday	1.04	1.07
Wednesday	1.06	1.09
Thursday	1.08	1.11
Friday	1.12	1.11
Saturday	0.89	0.92
Average Day	1.00	1.00

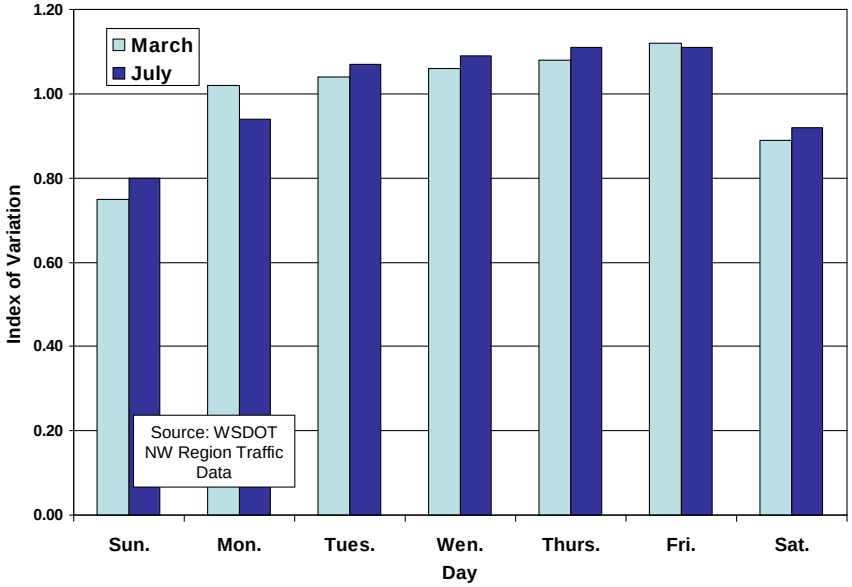
(1) Average of days in March 2005.
(2) Average of days in July 2005.

Source: WSDOT NW Region Traffic Data.

In March 2005, Friday had 12 percent more traffic than the average day, followed by Thursday, which had eight percent more traffic than the average day. Traffic demand was lowest on Sundays, recorded at 25 percent less traffic than the average day. Saturday had 11 percent less traffic demand than the average day.

In July 2005, traffic demand on Thursday and Friday was 11 percent above the average day. Weekend traffic was typically decreased by 20 percent on Sunday, and eight percent on Saturday, compared to the average day. Tuesday and Wednesday traffic volumes totaled seven percent and nine percent above the average day. These patterns are consistent with a roadway that serves a large commuter population.

Figure 2-6
2005 I-405 Daily Traffic Variations
Mainline South of Milepost 19.5 - NE 116th Street



HOURLY TRAFFIC VARIATIONS

Hourly traffic data was obtained from WSDOT for mainline locations in the Study Area for weekdays and weekend days. In order to illustrate the pattern of hourly variations in the Study Area, one weekday and one weekend day in March 2006 were selected as representative days at two mainline locations. These days were selected, after reviewing the patterns on multiple days, as being representative of daily peaking characteristics. The traffic volumes are not meant to be interpreted as average daily volumes.

Tables 2-2 and 2-3 present the hourly mainline traffic variations for a select weekday (Wednesday, March 9, 2005) and a select weekend day (Saturday, March 5, 2005) at the following locations:

- South of MP 19.5, NE 116th Street; and
- South of MP 26.8, SR 527.

The hourly traffic volumes are shown by direction. They include the GP lanes and the HOV lanes. The percentage of the total daily traffic each hour represents is also shown.

Table 2-2
2005 Weekday Hourly Variations (1)

Mainline South of Milepost 19.5 - NE 116th St. Wednesday, March 9, 2005					Mainline South of Milepost 26.8 - SR 527 Wednesday, March 9, 2005				
Hour	Total Traffic		Percent of Day		Hour	Total Traffic		Percent of Day	
Begin	NB	SB	NB	SB	Begin	NB	SB	NB	SB
0	736	460	0.8	0.5	0	476	332	0.8	0.5
1	433	330	0.4	0.3	1	283	219	0.4	0.4
2	372	373	0.4	0.4	2	250	250	0.4	0.4
3	335	467	0.3	0.5	3	256	336	0.4	0.5
4	721	1,333	0.7	1.3	4	573	1,020	0.9	1.6
5	1,845	4,199	1.9	4.2	5	1,477	3,111	2.3	5.0
6	4,008	7,383	4.2	7.5	6	3,013	4,776	4.8	7.7
7	5,050	7,551	5.2	7.6	7	3,661	4,223	5.8	6.8
8	4,791	7,249	5.0	7.3	8	3,073	3,874	4.9	6.2
9	4,424	6,867	4.6	7.0	9	2,815	3,980	4.5	6.4
10	4,543	5,970	4.7	6.0	10	2,700	3,314	4.3	5.3
11	4,879	5,591	5.1	5.7	11	3,102	3,141	4.9	5.0
12	5,483	5,577	5.7	5.6	12	3,409	3,219	5.4	5.2
13	5,913	5,549	6.1	5.6	13	3,720	3,344	5.9	5.4
14	6,496	5,769	6.7	5.8	14	4,212	3,803	6.7	6.1
15	7,625	6,161	7.9	6.2	15	4,927	3,940	7.8	6.3
16	7,401	6,094	7.7	6.2	16	4,892	4,131	7.7	6.6
17	6,801	5,992	7.1	6.1	17	4,918	4,218	7.8	6.8
18	6,608	4,665	6.9	4.7	18	4,683	3,340	7.4	5.4
19	5,803	3,621	6.0	3.7	19	3,635	2,267	5.7	3.6
20	4,347	2,615	4.5	2.6	20	2,667	1,890	4.2	3.0
21	3,770	2,331	3.9	2.4	21	2,225	1,608	3.5	2.6
22	2,441	1,561	2.5	1.6	22	1,392	1,101	2.2	1.8
23	1,583	1,094	1.6	1.1	23	883	925	1.4	1.5
Total	96,408	98,802	100.0	100.0		63,242	62,362	100.0	100.0

(1) Traffic volumes include both HOV and GP (general purpose) lanes.
Source: WSDOT NW Region Traffic Data.

WEEKDAY HOURLY TRAFFIC VARIATIONS

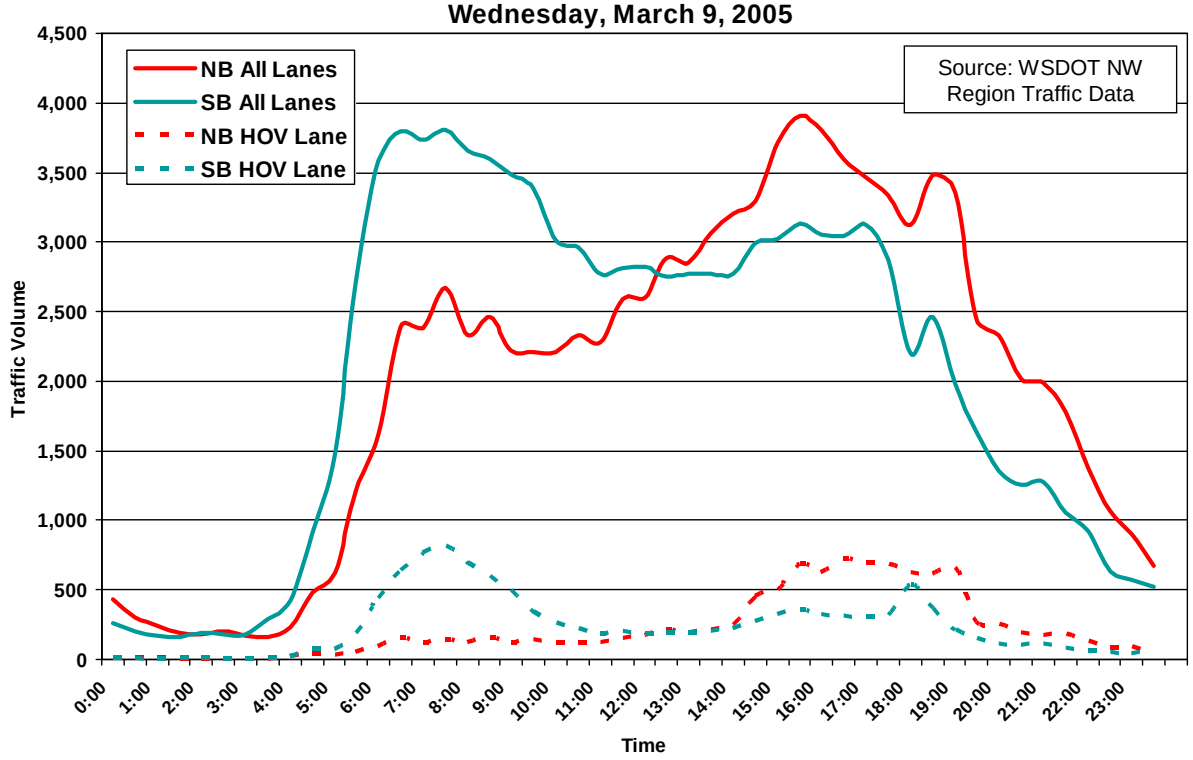
Table 2-2 shows that at both locations, the traffic in the northbound direction peaked in the afternoon between 2 p.m. and 7 p.m., creating a five-hour evening peak period. Southbound traffic at both locations peaked in the morning between 6 a.m. and 10 a.m., creating a four-hour morning peak period.

At the mainline section south of MP 19.5, NE 116th Street, approximately 36 percent of the northbound daily traffic occurred between 2 p.m. and 7 p.m., with hourly traffic volumes ranging from 6.7 percent (2-3 p.m.) to 7.9 percent (3-4 p.m.) of the daily total. In the southbound direction, south of MP 19.5, NE 116th Street, traffic volumes peaked in the morning between 6 a.m. and 10 a.m. During the morning peak period, hourly traffic volumes ranged from seven percent (9-10 a.m.) to 7.6 percent (7-8 a.m.) of the daily total. In sum, approximately 29 percent of the total daily traffic occurred during the morning peak period, from 6 a.m. to 10 a.m.

Hourly traffic variations at the mainline section south of MP 26.8, SR 527, were similar to the variations previously described at MP 19.5. In the northbound direction, approximately 37 percent of the daily traffic demand occurred between 2 p.m. and 7 p.m. Hourly northbound traffic volumes during the evening peak ranged from a low of 6.7 percent (2-3 p.m.) to a high of 7.8 percent (3-4 p.m. and 5-6p.m.) of the daily northbound traffic. Approximately 27 percent of the daily southbound traffic occurred during the morning peak period, from 6 a.m. to 10 a.m.

Hourly weekday traffic variations at the mainline section south of MP 19.5, NE 116th Street, are shown in Figure 2-7. Hourly traffic volumes by direction are shown for the combined GP and HOV lanes. HOV lane traffic volumes are graphed separately. Hourly traffic variations in the HOV lanes show a pattern similar to those for the total mainline lanes. This graphic is intended to illustrate the peaking characteristics of the traffic volumes, and is not intended to represent average daily traffic volumes.

Figure 2-7
2005 Weekday Hourly Variations - Mainline South of MP 19.5 (NE 116th St.)
Wednesday, March 9, 2005



WEEKEND DAY HOURLY TRAFFIC VARIATIONS

Table 2-3 shows hourly traffic volumes on Saturday, March 5, 2005, south of MP 19.5, NE 116th Street, and south of MP 26.8, SR 527. The peak traffic periods at both locations were in the middle of the day, from 12 p.m. to 6 p.m. in the northbound direction, and from 9 a.m. to 6 p.m. in the southbound direction.

South of MP 19.5, NE 116th Street, northbound hourly traffic volumes during the peak period ranged from 7.2 percent (1-3 p.m.) to 7.4 percent (noon-1 p.m. and 3-4 p.m.) of the daily northbound traffic. Northbound traffic volumes during the peak period (from 12 p.m. to 6 p.m.) accounted for approximately 44 percent of the daily northbound traffic. In the southbound direction, hourly traffic volumes during the peak period (from 9 a.m. to 6 p.m.) ranged from 6.6 percent (9-10 a.m.) to 7.1 percent (11 a.m. – noon) of the daily southbound traffic, totaling approximately 62 percent of all southbound traffic.

Table 2-3
2005 Weekend Day Hourly Variations (1)

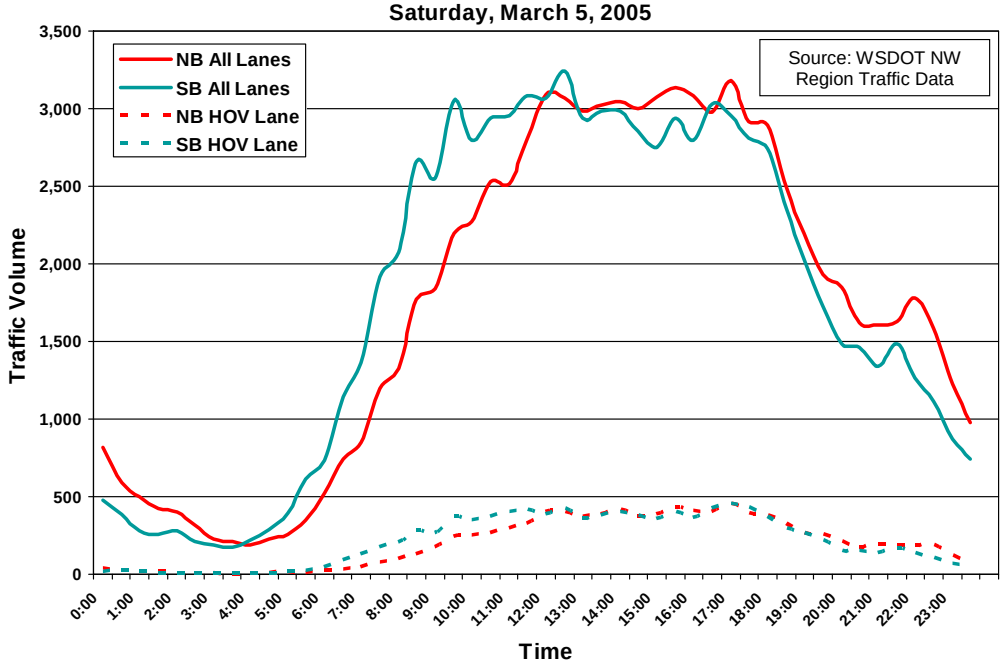
Mainline South of Milepost 19.5 - NE 116th St. Saturday, March 5, 2005					Mainline South of Milepost 26.8 - SR 527 Saturday, March 5, 2005				
Hour	Total Traffic		Percent of Day		Hour	Total Traffic		Percent of Day	
Begin	NB	SB	NB	SB	Begin	NB	SB	NB	SB
0	1,405	865	1.7	1.0	0	803	582	1.5	1.1
1	925	537	1.1	0.6	1	517	433	1.0	0.8
2	719	498	0.9	0.6	2	382	355	0.7	0.7
3	439	365	0.5	0.4	3	299	232	0.6	0.4
4	416	505	0.5	0.6	4	255	363	0.5	0.7
5	605	1,009	0.7	1.2	5	433	709	0.8	1.3
6	1,271	1,885	1.5	2.2	6	869	1,226	1.6	2.3
7	2,045	3,280	2.5	3.9	7	1,385	2,178	2.6	4.1
8	3,099	4,733	3.7	5.6	8	2,048	2,910	3.8	5.4
9	4,034	5,608	4.8	6.6	9	2,824	3,249	5.2	6.1
10	4,807	5,736	5.8	6.7	10	3,266	3,356	6.0	6.3
11	5,322	6,035	6.4	7.1	11	3,536	3,679	6.5	6.9
12	6,155	6,312	7.4	7.4	12	4,081	3,683	7.6	6.9
13	6,009	5,924	7.2	7.0	13	4,136	3,423	7.7	6.4
14	6,048	5,841	7.2	6.9	14	3,882	3,777	7.2	7.1
15	6,212	5,688	7.4	6.7	15	3,969	3,615	7.3	6.8
16	6,060	5,831	7.3	6.9	16	4,139	3,654	7.7	6.8
17	6,094	5,762	7.3	6.8	17	3,909	3,684	7.2	6.9
18	5,388	5,095	6.5	6.0	18	3,470	3,285	6.4	6.1
19	4,131	3,752	4.9	4.4	19	2,728	2,421	5.1	4.5
20	3,469	2,945	4.2	3.5	20	2,114	2,089	3.9	3.9
21	3,236	2,823	3.9	3.3	21	1,923	1,948	3.6	3.6
22	3,360	2,383	4.0	2.8	22	1,778	1,505	3.3	2.8
23	2,207	1,610	2.6	1.9	23	1,266	1,117	2.3	2.1
Total	83,456	85,022	100.0	100.0		54,012	53,473	100.0	100.0

(1) Traffic volumes include both HOV and GP (general purpose) lanes.
Source: WSDOT NW Region Traffic Data.

Further north on I-405, just south of MP 26.8, SR 527, very similar hourly traffic patterns were observed. Northbound hourly traffic volumes during the peak period ranged from 7.2 percent (2-3 p.m.) to 7.7 percent (1-2 p.m. and 4-5 p.m.) of the daily northbound traffic. During the peak period, northbound traffic accounted for approximately 45 percent of the daily northbound traffic. In the southbound direction, peak-period traffic volumes totaled approximately 60 percent of the daily southbound traffic. Hourly volumes ranged from 6.1 percent (9-10 p.m.) to 7.1 percent (2-3 p.m.) of the daily traffic during the peak period.

Figure 2-8 shows the hourly traffic volumes by direction on the I-405 mainline south of MP 19.5, NE 116th Street, for all mainline lanes, including traffic in the HOV lanes. The HOV lane traffic is also shown. The traffic in the HOV lanes shows a similar pattern to the total mainline lanes. This graphic is intended to illustrate the peaking characteristics of the traffic volumes, and is not intended to represent average daily traffic volumes

Figure 2-8
2005 Weekend Hourly Variations - Mainline South of MP 19.5 (NE 116th St.)
Saturday, March 5, 2005



GP AND HOV LANE PROFILE

Hourly traffic counts by direction were obtained from WSDOT for GP and HOV lanes for all weekdays in March 2005. The traffic counts were averaged to represent an average weekday in March. The data was summarized to illustrate the use of each lane type on a typical weekday for the following three mainline locations:

1. South of MP 19.5, NE 116th Street;
2. South of MP 22.6, NE 160th Street; and
3. South of MP 26.8, SR 527.

MAINLINE SOUTH OF NE 116TH STREET

Table 2-4 shows hourly traffic volumes by direction for GP and HOV lanes south of MP 19.5, NE 116th Street. At this location, there are three GP lanes and one HOV lane in each direction. The GP lane traffic volumes represent the total GP lane volume divided by the number of GP lanes (3), resulting in an average traffic volume per GP lane. Table 2-4 also shows the HOV lane traffic in a given hour as a percent of the total traffic for that hour across all the mainline lanes.

An average of 96,650 vehicles used the northbound mainline section on an average weekday in March 2005. Each GP lane averaged 28,670 vehicles, and the HOV lane averaged 10,640 vehicles. The HOV lane traffic totaled 11.0 percent of the daily northbound traffic. Between 2 p.m. and 7 p.m., the HOV lane traffic ranged from 11.6 percent to 19.6 percent of the total hourly traffic, and HOV lane hourly traffic volumes averaged between 790 and 1,430 vehicles per hour. During the same time period, traffic in the GP lanes ranged from 1,830 to 2,010 vehicles per hour per lane. During the peak hour (5-6 p.m.) an average of 7,320 vehicles used this mainline section in the northbound direction; 1,970 vehicles per lane in the three GP lanes, and 1,410 vehicles in the HOV lane.

An average of 98,830 vehicles used the southbound mainline section on an average weekday in March 2005. Each GP lane averaged 29,300 vehicles, and the HOV lane averaged 10,930 vehicles. The HOV lane traffic totaled 11.1 percent of the daily southbound traffic. Between 6 a.m. and 10 a.m., the HOV lane traffic ranged from 12.2 percent to 20.8 percent of the total southbound mainline traffic, averaging 840 to 1,530 vehicles per lane per hour. During the same time period, traffic in the GP lanes ranged from 1,910 to 2,080 vehicles per hour per lane. During the peak hour (7-8 a.m.), an average of 7,350 vehicles used this mainline section in the southbound direction; 1,940 vehicles per lane in the three GP lanes, and 1,530 vehicles in the HOV lane.

Table 2-4
Typical 2005 Weekday Traffic By Lane Type (1)
Mainline South of Milepost 19.5 - NE 116th Street

	Northbound Traffic				Southbound Traffic			
	Traffic Volumes Per Lane Type		Total Traffic	HOV Lane Traffic as Percent of Total	Traffic Volumes Per Lane Type		Total Traffic	HOV Lane Traffic as Percent of Total
Hour Begin	GP (2)	HOV (3)	All Lanes	Hourly Traffic	GP (2)	HOV (3)	All Lanes	Hourly Traffic
0	250	30	780	3.8	160	20	500	4.0
1	160	10	490	2.0	110	10	340	2.9
2	130	10	400	2.5	120	10	370	2.7
3	110	10	340	2.9	150	10	460	2.2
4	220	60	720	8.3	400	80	1,280	6.3
5	590	80	1,850	4.3	1,280	270	4,110	6.6
6	1,220	250	3,910	6.4	2,080	1,060	7,300	14.5
7	1,570	290	5,000	5.8	1,940	1,530	7,350	20.8
8	1,490	290	4,760	6.1	1,910	1,290	7,020	18.4
9	1,400	280	4,480	6.3	2,010	840	6,870	12.2
10	1,440	290	4,610	6.3	1,830	500	5,990	8.3
11	1,590	330	5,100	6.5	1,800	420	5,820	7.2
12	1,700	410	5,510	7.4	1,760	420	5,700	7.4
13	1,810	520	5,950	8.7	1,710	450	5,580	8.1
14	2,010	790	6,820	11.6	1,770	540	5,850	9.2
15	2,010	1,220	7,250	16.8	1,780	690	6,030	11.4
16	1,960	1,430	7,310	19.6	1,780	680	6,020	11.3
17	1,970	1,410	7,320	19.3	1,760	630	5,910	10.7
18	1,830	1,080	6,570	16.4	1,450	510	4,860	10.5
19	1,580	810	5,550	14.6	1,100	370	3,670	10.1
20	1,250	410	4,160	9.9	830	220	2,710	8.1
21	1,100	330	3,630	9.1	740	190	2,410	7.9
22	780	200	2,540	7.9	520	130	1,690	7.7
23	500	100	1,600	6.3	310	60	990	6.1
	28,670	10,640	96,650	11.0	29,300	10,930	98,830	11.1

(1) Based on all weekdays (Monday - Friday) in March 2005
(2) There are three general purpose (GP) lanes in this mainline section.
(3) There is one HOV lane in this mainline section.
Source: WSDOT NW Region Traffic Data.

MAINLINE SOUTH OF NE 160TH STREET

Table 2-5 shows hourly traffic volumes by direction for GP and HOV lanes south of MP 22.6, NE 160th Street. At this location, there are three GP lanes and one HOV lane in each direction.

An average of 81,670 vehicles used the northbound mainline section on an average weekday in March 2005. Each of the three GP lanes averaged 24,070 vehicles, and the one HOV lane averaged 9,460 vehicles during the average weekday. The average daily northbound HOV lane traffic totaled 11.6 percent of the daily northbound traffic. From 2 p.m. to 7 p.m. the HOV lane traffic ranged from 11.1 percent to 19.4 percent of the total hourly traffic, and HOV lane hourly traffic volumes averaged between 660 and 1,300 vehicles per hour. During the same time period, traffic in the GP lanes ranged from 1,660 to 1,830 vehicles per hour per lane. During the peak hour (4-5 p.m.), an average of 6,780 vehicles used this mainline section in the northbound direction; 1,830 vehicles per lane in the three GP lanes, and 1,290 vehicles in the HOV lane.

An average of 81,260 vehicles used the southbound mainline section on an average weekday in March 2005. Each of the three GP lanes averaged 23,710 vehicles, and the one HOV lane averaged 10,130 vehicles. The traffic in the GP lanes totaled 12.5 percent of the daily southbound traffic. Between 6 a.m. and 10 a.m. the HOV lane traffic ranged from 12.2 percent to 23.8 percent of the hourly southbound traffic, averaging 690 to 1,490 vehicles per hour. During the same time period, traffic in the GP lanes ranged from 1,530 to 1,900 vehicles per hour per lane. During the peak hour (6-7 a.m.), an average of 6,780 vehicles used this mainline section in the southbound direction; 1,900 vehicles per lane in the three GP lanes, and 1,080 vehicles in the HOV lane.

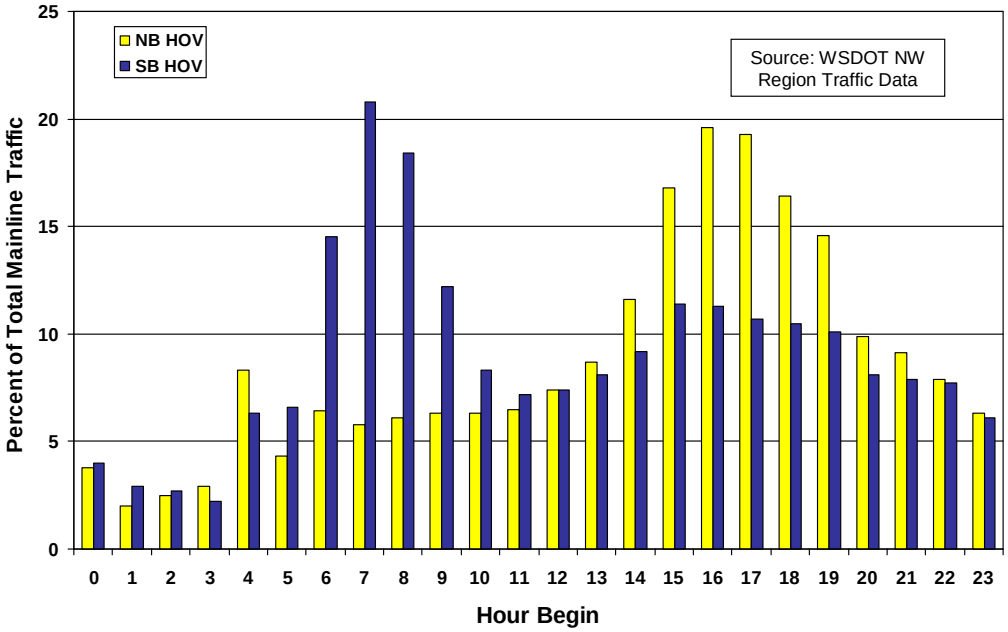
Figure 2-9 shows the percentage of HOV lane traffic compared to the total mainline traffic, by hour and direction at the mainline section south of MP 22.6, NE 160th Street. The northbound HOV lanes carried a total of 19.4 percent of total traffic during the evening peak hour from 5 p.m. to 6 p.m. The southbound HOV lanes carried 23.8 percent of the total hourly traffic from 7 a.m. to 8 a.m.

Table 2-5
Typical 2005 Weekday Traffic By Lane Type (1)
Mainline South of Milepost 22.6 - NE 160th Street

	Northbound Traffic				Southbound Traffic			
	Traffic Volumes Per Lane		Total Traffic	HOV Lane Traffic as Percent of Total	Traffic Volumes Per Lane		Total Traffic	HOV Lane Traffic as Percent of Total
Hour Begin	GP (2)	HOV (3)	All Lanes	Hourly Traffic	GP (2)	HOV (3)	All Lanes	Hourly Traffic
0	210	30	660	4.5	120	20	380	5.3
1	130	10	400	2.5	90	10	280	3.6
2	110	10	340	2.9	100	10	310	3.2
3	90	10	280	3.6	140	10	430	2.3
4	200	50	650	7.7	390	90	1,260	7.1
5	500	70	1,570	4.5	1,270	280	4,090	6.8
6	1,020	210	3,270	6.4	1,900	1,080	6,780	15.9
7	1,260	240	4,020	6.0	1,590	1,490	6,260	23.8
8	1,150	240	3,690	6.5	1,530	1,140	5,730	19.9
9	1,090	250	3,520	7.1	1,650	690	5,640	12.2
10	1,130	260	3,650	7.1	1,460	450	4,830	9.3
11	1,270	300	4,110	7.3	1,410	390	4,620	8.4
12	1,380	360	4,500	8.0	1,350	390	4,440	8.8
13	1,520	460	5,020	9.2	1,350	410	4,460	9.2
14	1,770	660	5,970	11.1	1,380	480	4,620	10.4
15	1,830	1,050	6,540	16.1	1,410	610	4,840	12.6
16	1,830	1,290	6,780	19.0	1,410	610	4,840	12.6
17	1,800	1,300	6,700	19.4	1,400	590	4,790	12.3
18	1,660	950	5,930	16.0	1,140	460	3,880	11.9
19	1,260	730	4,510	16.2	800	340	2,740	12.4
20	990	390	3,360	11.6	610	210	2,040	10.3
21	870	320	2,930	10.9	550	190	1,840	10.3
22	610	180	2,010	9.0	410	120	1,350	8.9
23	390	90	1,260	7.1	250	60	810	7.4
	24,070	9,460	81,670	11.6	23,710	10,130	81,260	12.5

(1) Based on all weekdays (Monday - Friday) in March 2005
(2) There are three general purpose (GP) lanes in this mainline section.
(3) There is one HOV lane in this mainline section.
Source: WSDOT NW Region Traffic Data.

Figure 2-9
Percent HOV-Lane Traffic of Total Mainline Traffic
I-405 South of Milepost 22.6 - NE 160th St.
Weekdays - March 2005



MAINLINE SOUTH OF SR 527

Table 2-6 shows hourly traffic volumes by direction for GP and HOV lanes south of MP 26.8, SR 527. At this location, there are two GP lanes and one HOV lane in each direction.

An average of 63,750 vehicles used the northbound mainline section on an average weekday in March 2005. Each of the two GP lanes averaged 27,720 vehicles per average weekday and the one HOV lane averaged 8,310 vehicles. The average weekday HOV lane traffic totaled 13.0 percent of the daily northbound traffic. Between 4 p.m. and 6 p.m., the HOV lane traffic accounted for approximately 24 percent of the total hourly traffic, with HOV lane hourly traffic volumes averaging approximately 1,200 vehicles per hour. During the same time period, traffic in the GP lanes ranged from 1,850 to 1,900 vehicles per hour per lane. During the peak hour (4-5 p.m.), an average of 5,010 vehicles used this mainline section in the northbound direction; 1,900 vehicles per lane in the two GP lanes, and 1,210 vehicles in the HOV lane.

An average 62,470 vehicles used the southbound mainline section on an average weekday in March 2005. Each of the two GP lanes averaged 26,890 vehicles, and the one HOV lane averaged 8,690 vehicles on the average weekday. The southbound HOV

Table 2-6
Typical 2005 Weekday Traffic By Lane Type (1)
Mainline South of Milepost 26.8 - SR 527

	Northbound Traffic				Southbound Traffic			
Hour Begin	Traffic Volumes Per Lane GP (2)	HOV (3)	Total Traffic All Lanes	HOV Lane Traffic as Percent of Total Hourly Traffic	Traffic Volumes Per Lane GP (2)	HOV (3)	Total Traffic All Lanes	HOV Lane Traffic as Percent of Total Hourly Traffic
0	230	30	490	6.1	160	20	340	5.9
1	140	10	290	3.4	110	10	230	4.3
2	140	10	290	3.4	110	10	230	4.3
3	120	10	250	4.0	160	10	330	3.0
4	260	40	560	7.1	450	80	980	8.2
5	710	60	1,480	4.1	1,420	260	3,100	8.4
6	1,400	150	2,950	5.1	1,850	1,000	4,700	21.3
7	1,740	190	3,670	5.2	1,400	1,210	4,010	30.2
8	1,490	180	3,160	5.7	1,470	790	3,730	21.2
9	1,310	210	2,830	7.4	1,690	470	3,850	12.2
10	1,300	220	2,820	7.8	1,540	330	3,410	9.7
11	1,510	260	3,280	7.9	1,500	310	3,310	9.4
12	1,620	300	3,540	8.5	1,530	320	3,380	9.5
13	1,690	380	3,760	10.1	1,550	360	3,460	10.4
14	1,940	540	4,420	12.2	1,690	440	3,820	11.5
15	1,950	950	4,850	19.6	1,730	530	3,990	13.3
16	1,900	1,210	5,010	24.2	1,810	550	4,170	13.2
17	1,850	1,190	4,890	24.3	1,850	560	4,260	13.1
18	1,790	930	4,510	20.6	1,480	450	3,410	13.2
19	1,410	610	3,430	17.8	1,030	350	2,410	14.5
20	1,110	330	2,550	12.9	790	230	1,810	12.7
21	990	270	2,250	12.0	730	210	1,670	12.6
22	690	160	1,540	10.4	520	130	1,170	11.1
23	430	70	930	7.5	320	60	700	8.6
	27,720	8,310	63,750	13.0	26,890	8,690	62,470	13.9

(1) Based on all weekdays (Monday - Friday) in March 2005
(2) There are two general purpose (GP) lanes in this mainline section.
(3) There is one HOV lane in this mainline section.
Source: WSDOT NW Region Traffic Data.

lane traffic totaled 13.9 percent of the daily southbound traffic. Between 6 a.m. and 10 a.m. the HOV lane traffic ranged from 12.2 to 30.2 percent of the total hourly mainline traffic, averaging 470 to 1,210 vehicles per hour. During the same time period, traffic in the GP lanes ranged from 1,400 to 1,850 vehicles per hour per lane. During the peak hour (6-7 a.m.), an average of 4,700 vehicles used this mainline section in the southbound direction; 1,850 vehicles per lane in the two GP lanes, and 1,000 vehicles in the HOV lane.

MAINLINE VEHICLE CLASS DISTRIBUTION

Estimates of the vehicle class distribution in 2005 were developed for mainline locations, using WSDOT's Northwest Region traffic data. The average vehicle class distribution in percentages was developed for average weekdays, weekend days, and total days in 2005. Table 2-7 shows the percent distribution of vehicle class for average weekdays and average days in 2005 for the following three select locations on I-405 in the Study Area:

- South of SR 527;
- South of NE 116th Street; and
- South of NE 70th Street.

Table 2-7
I-405 - 2005 Estimated Vehicle Class Distribution

Mainline Location	Passenger Cars (1)	Single Unit Trucks (2)	Trailer Trucks (3)	All Trucks	Total Vehicles
	Percent Vehicle Class - Weekdays				
South of SR 527	95.9	1.5	2.6	4.1	100.0
South of NE 116th St.	97.2	0.8	2.0	2.8	100.0
South of NE 70th St.	95.3	1.6	3.1	4.7	100.0
	Percent Vehicle Class - All Days				
South of SR 527	95.5	1.7	2.8	4.5	100.0
South of NE 116th St.	97.6	0.7	1.7	2.4	100.0
South of NE 70th St.	95.7	1.5	2.8	4.3	100.0

(1) Includes motorcycles, cars, and other two-axle four-tire single unit vehicles less than 19.9 feet.
(2) Includes buses, 2-axle 6-tire, and 3 and 4-axle single-unit trucks.
(3) Includes trailer trucks.
Source: WSDOT NW Region Traffic Data.

Passenger cars represented approximately 95 percent to 97 percent of the traffic on an average weekday. Trucks represented approximately three percent to five percent of the total traffic. Single unit trucks (two-axle, three-axle, and four-axle), including buses and six-tire trucks, represented approximately one percent to 1.5 percent of the total traffic. Trailer trucks represented the remaining two percent to three percent of the total traffic. The vehicle class distribution on an average day in 2005 was virtually identical to the average weekday distribution in 2005.

TRAVEL SPEED PROFILE

Variations in levels of traffic congestion on the I-405 corridor are similar to variations on other heavily traveled freeways throughout the United States and within the Puget Sound region. One measure of congestion is vehicle travel speed, and the resulting travel time on the roadway. Figures 2-10 and 2-11 show the travel speed and the cumulative travel time for both free-flow and congested conditions between interchanges during the southbound morning peak period (6:30 a.m. to 8:30 a.m.) and the northbound evening peak period (3:30 p.m. to 5:30 p.m.), respectively. WSA collected the data on multiple weekdays (Tuesdays through Thursdays) in June 2006, prior to the end of the school year.

During the peak periods, travel speeds on many sections of I-405 in the Study Area are significantly lower than the posted speed limit of 60 mph. The travel time for a trip between I-5 and SR 520 under congested conditions is approximately 30 minutes during the peak periods compared to approximately 15 minutes under free-flow conditions. Between 6:30 a.m. and 8:30 a.m. in the southbound direction, the slowest mainline sections occurred between SR 527 and NE 116th Street, where average travel speeds were 35 mph or less. Between 3:30 p.m. and 5:30 p.m. in the northbound direction, the slowest mainline sections occurred between SR 520 and NE 116th Street, and between NE 195th Street and SR 527, where average travel speeds were consistently less than 30 mph.

Figure 2-10
2006 Travel Speed and Cumulative Travel Time Profile

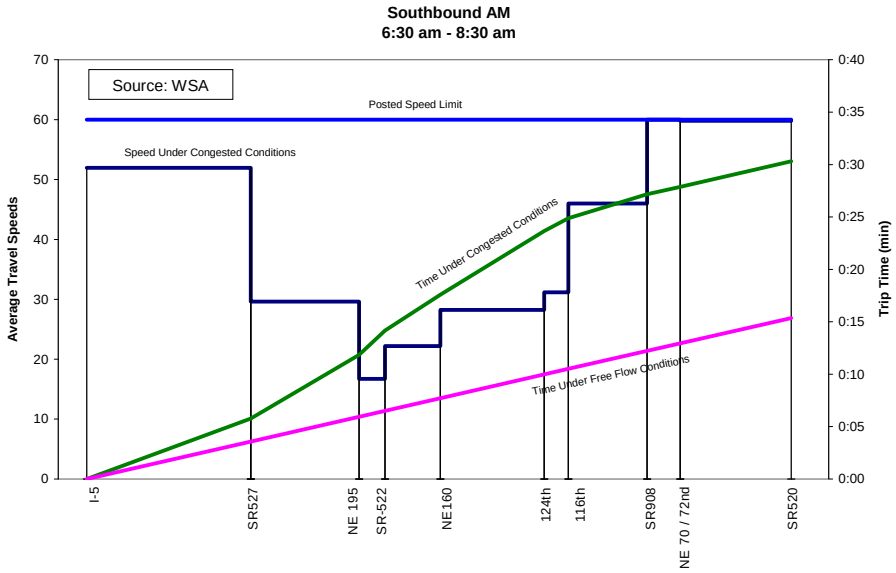
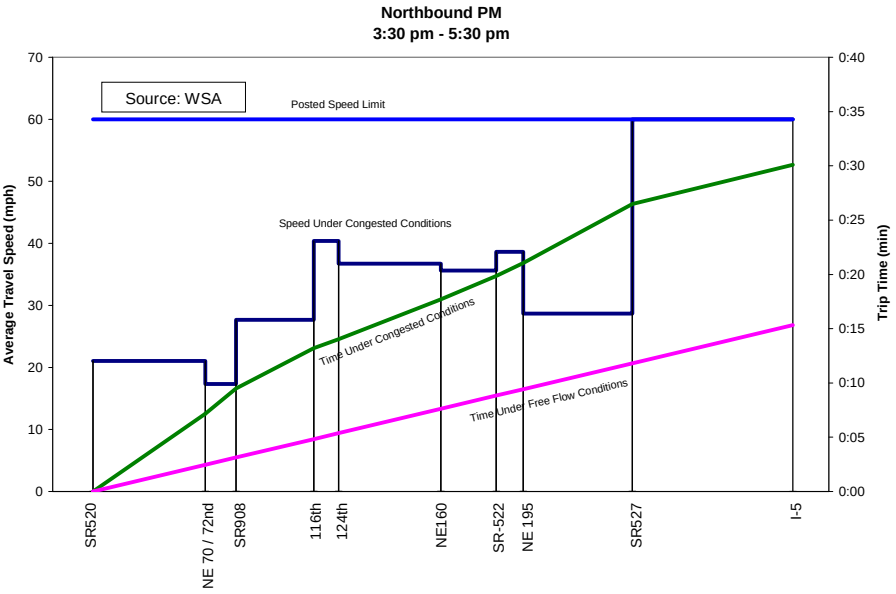


Figure 2-11
2006 Travel Speed and Cumulative Travel Time Profile



HISTORIC TRAFFIC GROWTH

Traffic on I-405 in the Study Area has been increasing in recent years. Table 2-8 presents average daily traffic at nine locations along I-405 in 1999, 2002 and 2005. The traffic volumes represent the total traffic in both directions, including the HOV lanes. The data was gathered from WSDOT's Annual Traffic Reports.

Table 2-8
I-405 Historic Traffic Trends From 1999 To 2005

	Location	Average Daily Traffic					AAPC	
Milepost	From South To North	1999	AAPC	2002	AAPC	2005	1999-2005	
15.94	North of SR 520	178,000	0.3	179,600	1.5	187,800	0.9	
19.59	South of NE 116th St.	153,000	0.5	155,300	1.5	162,400	1.0	
20.31	At NE 124th St.	118,000	0.9	121,300	1.5	126,868	1.2	
21.95	South of NE 160th St.	141,000	1.7	148,500	1.5	155,300	1.6	
22.92	North of NE 160th St.	140,000	4.3	159,000	1.5	166,200	2.9	
24.02	North of SR 522	NA		101,400	1.8	107,000	1.8	(1)
24.48	At NE 195th St.	NA		94,200	1.8	99,500	1.8	(1)
25.02	North of NE 195th St.	101,000	4.1	114,000	1.8	120,400	3.0	
28.99	North of SR 527	91,000	1.8	96,000	3.8	107,300	2.8	

(1) AAPC from 2002 to 2005.
Note: AAPC = Average Annual Percent Change
Source: WSDOT Annual Traffic Report

The average annual traffic growth on I-405 in the Study Area between 1999 and 2005 ranged from 0.9 percent north of SR 520, to 3.0 percent north of NE 195th Street. The areas of higher traffic growth coincide with the rapid residential growth in the northern part of the Study Area. As described in Chapter 3, Socio-Demographic Analysis, anticipated growth in households and employment are expected to continue, thus driving the demand for increased vehicle traffic in the Study Area.

APPLICATION OF DATA COLLECTION EFFORT

WSA developed a 2005 operating profile of I-405 in the Study Area in order to verify that the WSDOT/PSRC 2005 traffic model and trip tables were a satisfactory and appropriate base to develop future year traffic models that would be used in the analysis of potential Express Toll Lanes. The operating profile developed by WSA, included variables such as:

- Estimated 2005 average weekday traffic volumes on mainline s and ramps;
- Estimated 2005 average daily traffic by month on mainline sections;
- Estimated average daily traffic variations in 2005;
- Estimated average hourly variations for a typical weekday in 2005;
- Estimated 2005 average daily traffic for GP and HOV lanes;
- Estimated vehicle class distribution on mainline sections;
- Estimated 2006 travel time and travel speed by direction, on weekdays, on mainline sections of I-405;
- A summary of recent traffic growth on I-405 mainline sections to use as a comparison with growth estimates in future year trip tables.

The information developed above was compared to output from the WSDOT/PSRC 2005 model, and examined for consistency. WSA concluded that the 2005 WSDOT/PSRC model reflects the operating characteristics of I-405 in the Study Area, and thus serves as an appropriate base for development of future year models and trip tables to be used in the evaluation of the traffic and toll revenue potential of the proposed I-405 Express Toll Lanes.

CHAPTER 3

SOCIO-DEMOGRAPHIC ANALYSIS

Northern Economics, Inc. (NEI) developed a socio-demographic forecast of four counties in the Puget Sound. The results of the forecast were used to adjust trip tables for a traffic and revenue analysis of proposed express toll lanes along the length of I-405. NEI's findings were documented in a publication titled *Technical Memorandum: Socio-Demographic Forecast of Employment, Households and Population of King, Kitsap, Pierce and Snohomish Counties*, dated December 19, 2006.

The geographic area covered in the forecast includes King, Kitsap, Pierce, and Snohomish counties. The socio-demographic variables include population, number of households, and employment. The forecast years are 2010, 2020, and 2030.

In general, socio-demographic data is used to estimate travel demand. Information on the number of people who reside in an area; how many households are in an area; and the number and location of jobs in an area are used to estimate travel demand and travel patterns.

This chapter summarizes NEI's methodology and forecasts. The following sections are included in this chapter:

- **Background** – Describes the groundwork for the socio-demographic analysis.
- **PSRC Socio-Demographic Estimates and Forecasts** – Describes the existing data and forecasts developed by the Puget Sound Regional Council (PSRC) that were used as the baseline for NEI's modified forecasts.
- **Analytical Methodology** - Describes NEI's three primary procedures to analyze and modify the PSRC forecasts.
- **NEI Modified PSRC Forecasts** – Summarizes the NEI modified PSRC forecasts by county of population, number of households, and employment, and compares the modified forecasts with the PSRC forecasts.

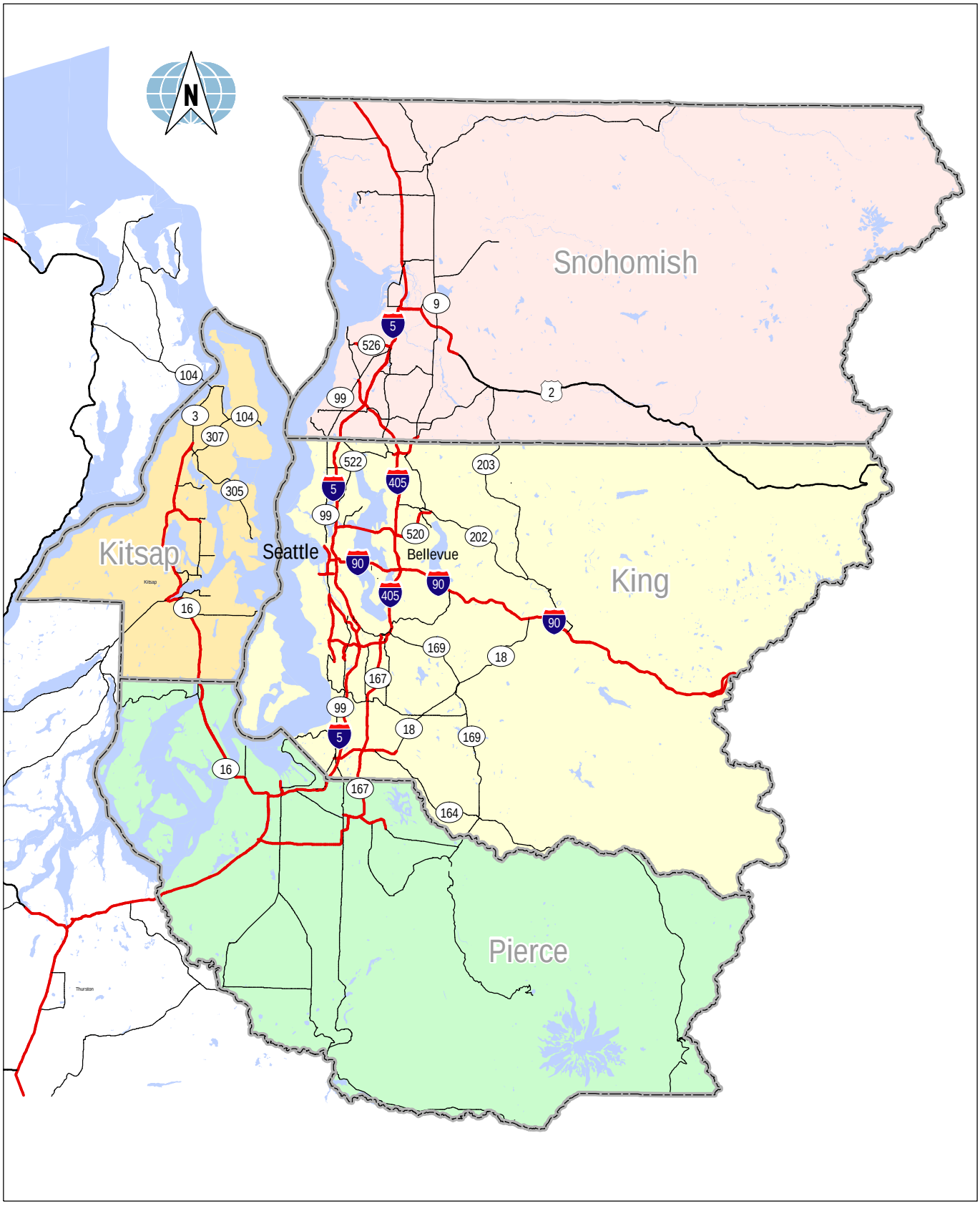
- **Application of NEI Modified PSRC Forecasts** – Summarizes how the NEI modified PSRC forecasts were used in the rest of the study.

BACKGROUND

NEI used the PSRC's decadal socio-demographic forecast as a baseline for current and projected levels of population, number of households, and employment. PSRC is an association of cities, towns, counties, ports and state agencies that serves as a forum for developing policies and making decisions about regional growth and transportation issues in the four-county central Puget Sound region. PSRC is designated as a Metropolitan Planning Organization under federal law, and as a Regional Transportation Planning Organization under Washington state law. Under federal law, PSRC must follow the metropolitan planning process in order for federal transportation funds to be distributed to the region. As part of the planning process, PSRC continuously assesses development patterns including population, number of households, and employment, in order to make efficient decisions and recommendations on transportation facilities.

PSRC periodically publishes a report titled *Population and Employment Forecasts – Central Puget Sound Region*. The report includes both historical estimates and future forecasts of population, number of households, and employment for small geographic areas within the four-county area. Historically, PSRC has updated the estimates and forecasts every three to four years. The most recent report, published in November 2004, includes estimates of socio-demographic variables for 1970, 1980, 1990, and 2000, and forecasts for 2010, 2020, and 2030.

The socio-demographic data for the four-county area is available in geographic units called Forecast Area Zones (FAZs) and Traffic Analysis Zones (TAZs). The four counties are disaggregated into 216 FAZs. The FAZs are further disaggregated into 938 TAZs. Table 3-1 shows the number of FAZs and TAZs by county. The PSRC four-county area is shown in Figure 3-1. Figures A-1 through A-4 in Appendix A show the FAZs and FAZ Groups within the four counties. A FAZ Group is an aggregation of FAZs that make up a city, town or community. In Figures A-1 through A-4, the FAZ Groups are indicated with bold outlines and numbers, and the FAZs are shown with fainter borders and smaller numbers. The names of the FAZ groups are shown on the figures.



WilburSmith ASSOCIATES

PUGET SOUND REGIONAL COUNCIL AREA

FIGURE 3-1

Table 3-1
Number of FAZs and TAZs in PSRC
Four County Region

County	Number of FAZs	Number of TAZs
King	100	515
Kitsap	22	61
Pierce	50	206
Snohomish	47	141
Total	219	923

Source: PSRC

Trip tables for the four-county area were developed by PSRC based on the socio-demographics published in PSRC's 2004 *Population and Employment Forecasts – Central Puget Sound Region.* NEI was asked to review the forecasts and make recommended changes on a TAZ level for population, number of households, and employment. These variables are used to estimate trip volumes and patterns in the regional traffic demand model. The recommended changes would serve as the basis for modifying trip tables used in this study.

A principal challenge that NEI faced was the timing and duration of economic recovery in the central Puget Sound area from a recession that lasted from March 2001 through November 2001 (National Bureau of Economic Research). During the recession, Washington State lost 74,100 nonagricultural jobs. King County accounted for 88 percent of the state's net job loss, even though it only accounted for approximately 42 percent of total employment. Job losses continued in King County after the recession. Table 3-2 shows the net percent change in jobs in the four counties between December 2001 and December 2003. Employment increased in Snohomish, Kitsap and Pierce counties by 1.1 percent, 5.7 percent, and 3.8 percent, respectively, over the two-year period. Employment decreased in King County by 3.4 percent.

Table 3-2
Percent Change in Employment
in Two Year Period From
December 2001 to December 2003

County	Percent Change
King (1)	(3.4)
Snohomish(1)	1.1
Kitsap (1)	5.7
Pierce (1)	3.8

1) Counties in PSRC area.

Source: Washington Employment Security Department 2006c.

Job loss in the aerospace industry heavily impacted both King and Snohomish counties. According to the Washington Employment Security Department's nonagricultural employment estimates, the aerospace industry lost 23,300 jobs from December 2001 to December 2003 in Washington State. Out of that total, 15,900 of those job losses occurred in King County. The rest of the aerospace job losses occurred largely in Snohomish County.

Using data available after PSRC's last published report, NEI developed recommended modifications to PSRC's forecasts of population, number of households, and employment for 2010, 2020, and 2030. The new data included preliminary information on 2005 population and number of households, and 2004 employment from PSRC. NEI also collected employment data from the Washington Employment Security Department and land development data from counties, cities and towns within the study area. NEI's modifications to the PSRC forecasts reflected recent information on the pace of recovery from the recession and current land development plans.

PSRC SOCIO-DEMOGRAPHIC ESTIMATES AND FORECASTS

This section describes PSRC's socio-demographic estimates and forecasts as available in its 2004 *Population and Employment Forecasts – Central Puget Sound Region.* These include the variables for population, number of households, and employment. Estimates of these variables will be called "actuals" in this study. Actuals were available for 1970, 1980, 1990, and 2000. Forecasts were available for 2010, 2020, and 2030. Table 3-3 shows this data by county. Variables were available for the TAZs, but for purposes of summarizing, they will be described on a county basis.

Figure 3-2 illustrates the total population, number of households, and employment, in the four-county area. All three variables show a relatively steady increase through 2030. The Average Annual Percent Change (AAPC) in the variables is shown in both Table 3-3 and in Figure 3-3, and can be summarized as follows:

- Population increased by an average of 1.8 percent per year between 1970 and 2000, and is forecast to increase by an average of 1.1 percent per year from 2000 to 2030.
- Rate of growth in number of households increased by an average of 2.4 percent per year from 1970 to 2000, and is forecast to increase by an average of 1.3 percent per year from 2000 to 2030.
- Employment increased by an average of 2.9 percent per year between 1970 and 2000, and is forecast to increase by an average of 1.3 percent per year from 2000 to 2030.

Table 3-3
PSRC Socio-Demographic Estimates and Forecasts At the County Level (1)

Employment - thousands

County	1970	AAPC	1980	AAPC	1990	AAPC	2000	AAPC	2010	AAPC	2020	AAPC	2030
King	466.6	4.1	697.4	3.4	972.6	2.0	1,188.6	1.3	1,351.2	1.2	1,516.9	1.0	1,670.8
Kitsap	38.4	4.0	56.7	3.4	79.3	0.6	83.9	1.3	95.3	1.4	109.1	1.1	122.3
Pierce	163.4	0.7	175.9	2.4	224.1	1.5	259.0	1.6	302.2	1.3	343.9	1.1	384.6
Snohomish	72.5	3.6	103.4	5.1	169.4	2.5	217.3	1.9	261.9	1.7	308.7	1.5	358.2
Total	740.9	3.4	1,033.4	3.4	1,445.2	1.9	1,748.8	1.4	2,010.6	1.3	2,278.6	1.1	2,535.9

Households - thousands

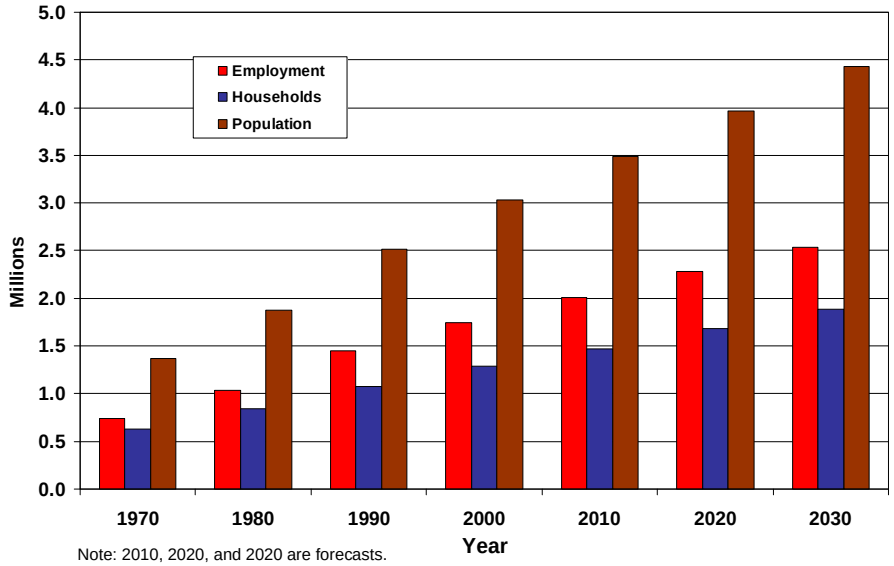
County	1970	AAPC	1980	AAPC	1990	AAPC	2000	AAPC	2010	AAPC	2020	AAPC	2030
King	391.9	2.4	497.3	2.2	615.8	1.4	710.9	1.0	782.1	1.1	869.4	1.0	959.5
Kitsap	32.9	4.9	52.8	2.7	69.3	2.2	86.4	1.6	101.3	1.7	119.6	1.3	136.3
Pierce	123.8	3.5	174.2	2.1	214.7	2.0	260.8	1.7	310.2	1.5	360.4	1.1	400.2
Snohomish	80.9	4.1	120.7	3.6	171.6	2.7	224.8	2.3	281.3	1.9	338.9	1.5	393.0
Total	629.5	3.0	845.0	2.4	1,071.3	1.8	1,283.0	1.4	1,474.8	1.4	1,688.3	1.1	1,889.1

Population - Thousands

County	1970	AAPC	1980	AAPC	1990	AAPC	2000	AAPC	2010	AAPC	2020	AAPC	2030
King	1,159.5	0.9	1,269.7	1.7	1,507.3	1.4	1,737.0	0.7	1,869.5	0.9	2,039.5	0.8	2,202.4
Kitsap	101.8	3.8	147.2	2.6	189.7	2.0	232.0	1.2	262.5	1.4	301.5	1.2	339.9
Pierce	412.5	1.6	485.6	1.9	586.2	1.8	700.8	1.4	806.1	1.3	914.1	1.0	1,007.6
Snohomish	265.3	2.4	337.7	3.3	465.6	2.7	606.0	1.9	733.2	1.6	860.2	1.4	985.2
Total	1,939.0	1.5	2,240.3	2.1	2,748.9	1.8	3,275.8	1.1	3,671.2	1.1	4,115.3	1.0	4,535.1

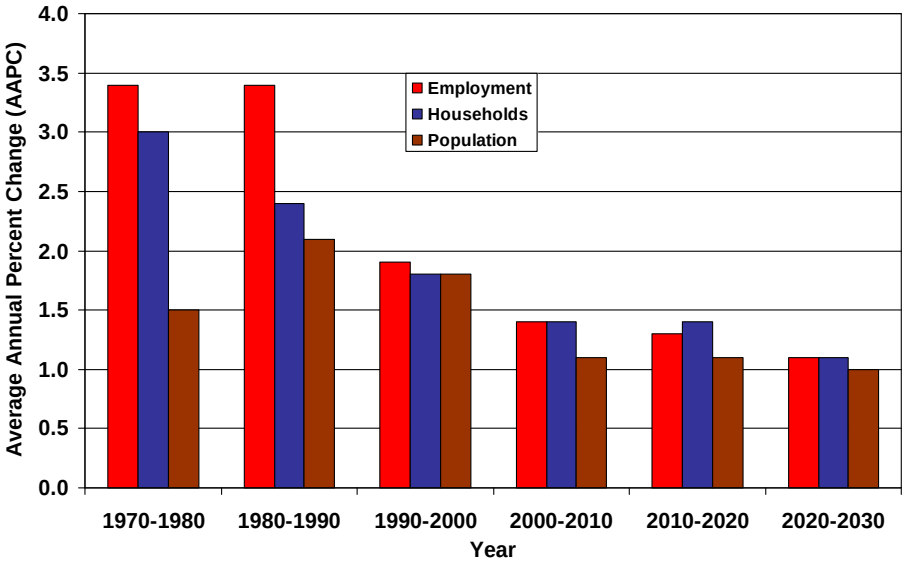
(1) From the PSRC's *Population and Employment Forecasts - Central Puget Sound Region* , published 2004. Forecasts start at 2010.
Note: AAPC is the average annual percent growth between two years.
Source: PSRC

Figure 3-2
PSRC's Socio-Dempographic Estimates and Forecasts



Note: 2010, 2020, and 2020 are forecasts.
Source: PSRC

Figure 3-3
Average Annual Percent Change In PSRC Estimates and Forecasts



Note: 2010, 2020, and 2020 are forecasts.
Source: PSRC

PSRC provided NEI with preliminary interim data for 2005 population and number of households, and 2004 employment. This information is shown in Table 3-4.

With the inclusion of the 2004 employment data, as shown in Table 3-4, a very different trend is presented in regard to employment. Overall, employment decreased between 2000 and 2004 by approximately 2.4 percent, an average of 0.6 percent per year in the four-county area. Employment loss in King County totaled approximately 5.3 percent. Snohomish County lost less than one percent of its employment. Kitsap County and Pierce County both experienced net employment increases from 2000 through 2004. Many of the job losses in King and Snohomish counties are attributed to the decrease in aerospace employment as described above. Table 3-4 shows that trends in population and number of households remain consistent with the original PSRC forecasts.

The 2004/2005 preliminary data indicates that the PSRC forecasts will need to be updated to reflect recent experience including the impacts from the 2001 recession, particularly for employment. Figure 3-4 includes the 2004/2005 data and shows the PSRC averaged growth rates for population, number of households, and employment for the four-county area. It also shows the decreased employment in the four-county area between 2000 and 2004, and the high rate of growth in employment that would have to occur in order to meet PSRC's forecast for 2010.

Table 3-4
Interim 2005 Socio-Demographic Data

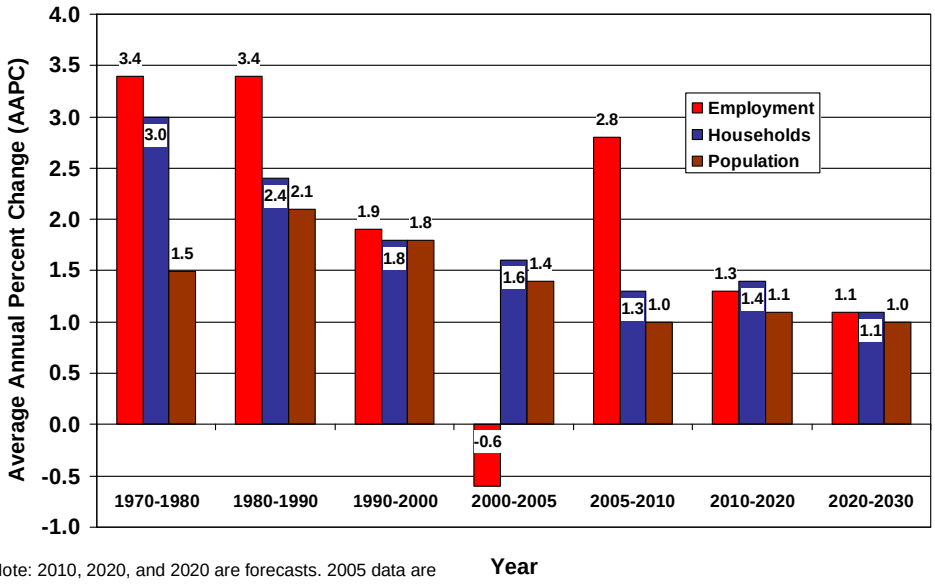
	Employment - thousands				
County	2000	AAPC	2004	AAPC	2010
King	1,188.6	(1.3)	1,126.2	3.1	1,351.2
Kitsap	83.9	2.1	91.1	0.7	95.3
Pierce	259.0	1.4	274.3	1.6	302.2
Snohomish	217.3	(0.2)	215.9	3.3	261.9
Total	1,748.8	(0.6)	1,707.4	2.8	2,010.6

	Households - thousands				
County	2000	AAPC	2005	AAPC	2010.0
King	710.9	1.2	744.5	0.8	782.1
Kitsap	86.4	1.8	92.8	1.5	101.3
Pierce	260.8	2.1	283.3	1.5	310.2
Snohomish	224.8	2.2	245.2	2.3	281.3
Total	1,283.0	1.6	1,365.8	1.3	1,474.8

	Population - thousands				
County	2000	AAPC	2005	AAPC	2010.0
King	1,737.0	1.0	1,808.6	0.6	1,869.5
Kitsap	232.0	0.9	240.4	1.5	262.5
Pierce	700.8	1.9	755.9	1.1	806.1
Snohomish	606.0	2.0	655.8	1.9	733.2
Total	3,275.8	1.4	3,460.7	1.0	3,671.2

Note: AAPC is the average annual percent growth between two years.
Source: PSRC

Figure 3-4
Rates of Change in PSRC Data With Interim 2005



Note: 2010, 2020, and 2020 are forecasts. 2005 data are preliminary points. Preliminary employment is from 2004.
Source: PSRC

An examination at the county level further clarifies the recent trend in employment. Figures 3-5 and 3-6 show the average annual growth rates between decades, and include the interim 2004 data point for King and Snohomish counties. Regarding King County, given the actual experience through 2004, the growth in employment would have to average 3.1 percent per year between 2004 and 2010 in order to meet PSRC's forecast. The growth rate in employment in Snohomish County would have to average 3.3 percent per year to meet the forecast levels. These are relatively high rates of growth that approach historical highs.

Figures 3-7 and 3-8 show employment growth, including data from 2004, in Pierce and Kitsap counties. Employment growth was positive in both of these counties from 2000 through 2004. The growth patterns for Pierce County are very consistent between the actual and forecast years. Actual growth in Kitsap County between 2000 and 2004 averaged 2.1 percent per year, high compared to recent trends. To achieve PSRC's original forecast, employment would only have to increase by an average of 0.7 percent per year. PSRC's forecasts will need to be adjusted upward to reflect higher than anticipated growth.

Figure 3-5
King County - Employment Trends and Forecasts

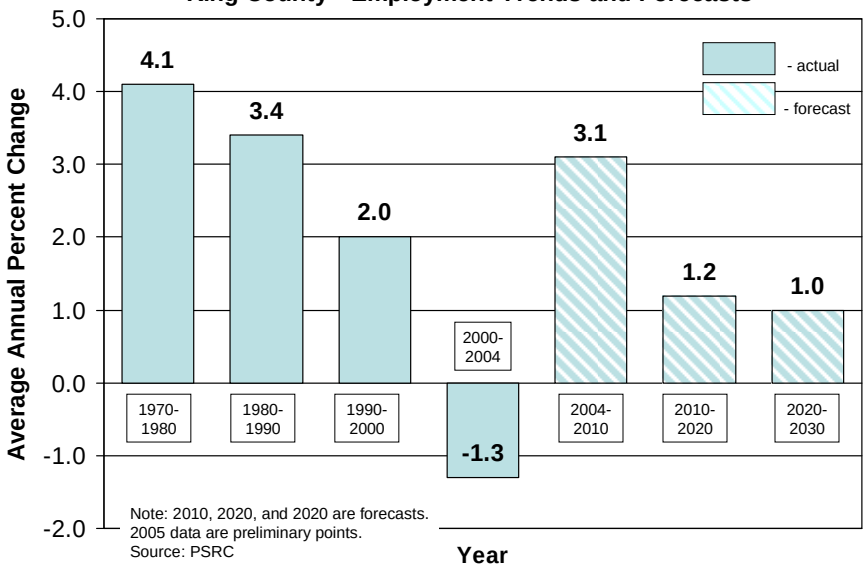


Figure 3-6
Snohomish County - Employment Trends and Forecasts

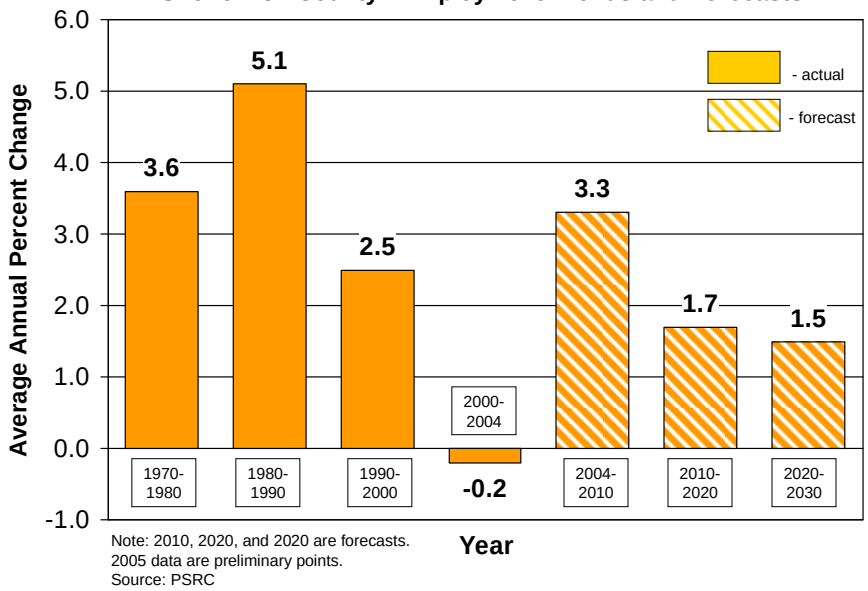
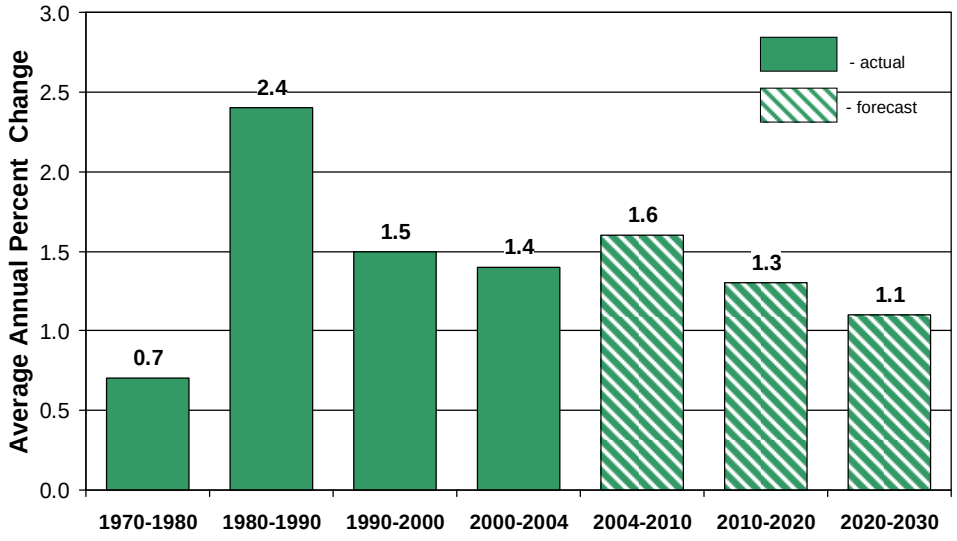
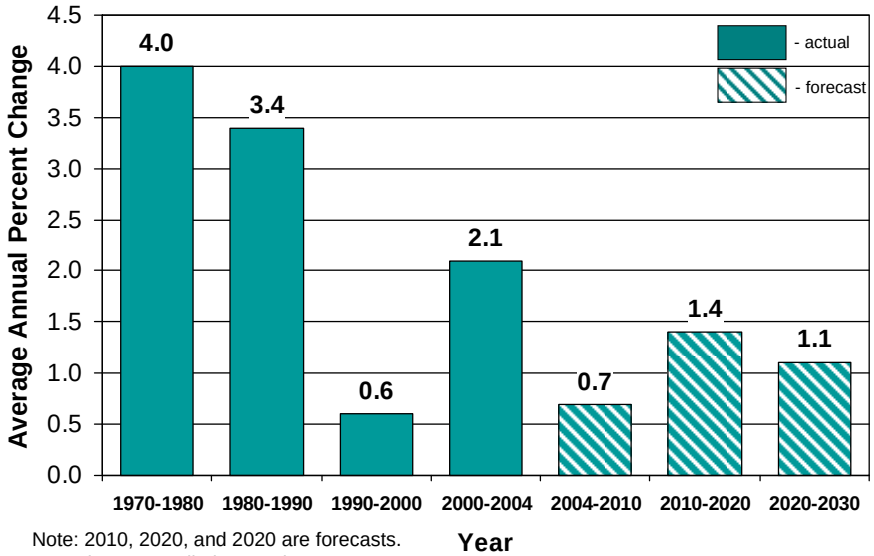


Figure 3-7
Pierce County - Employment Trends and Forecasts



Note: 2010, 2020, and 2020 are forecasts.
2005 data are preliminary points.
Source: PSRC

Figure 3-8
Kitsap County - Employment Trends and Forecasts



Note: 2010, 2020, and 2020 are forecasts.
2005 data are preliminary points.
Source: PSRC

The review of PSRC data was conducted at a county level and at a FAZ level. The next section describes the methodologies that NEI used to analyze and develop recommended changes to population, number of households, and employment for 2010, 2020, and 2030.

ANALYTICAL METHODOLOGY

NEI analyzed the PSRC forecasts from two perspectives. First, NEI used a bottom-up approach, which entailed reviewing land development plans in the four-county area to determine the current status of planned and committed projects. Land development analysis was conducted at the TAZ level. Results from the land use review were discussed with PSRC staff to determine whether the projects had already been incorporated in the published 2004 socio-demographic forecasts. The second approach involved a long-term trend analysis at the FAZ level. Long-term trend data at the TAZ level was not available. In addition, NEI examined recommended changes made previously by Mirai Associates (Mirai). Each of these analyses is described in this section.

REVIEW OF LAND DEVELOPMENT PLANS

NEI researched development plans with local and regional agencies to identify development projects that were committed, planned, canceled, or delayed in the last several years, and that were of significant size to impact PSRC's forecasts. Once projects were identified that may have potential impacts, an estimate was made of the population, number of households, and/or employment impact(s) the development may have.

Employment impacts were developed using PSRC norms equating an average of three jobs created per 1,000 square feet of business, commercial, or retail space. This ratio was applied to project-specific estimates of square footage in order to estimate employment impacts. Population impacts associated with new housing developments were calculated based on PSRC's 2003 ratio of population to number of households for the specific TAZ of interest. Therefore, population impacts were assumed to be directly related to the anticipated number of new households.

The identified projects that had potential impacts to PSRC's forecasts were discussed with PSRC staff to determine whether the projects were adequately represented in the PSRC forecasts. NEI identified a total of 10 projects that required modifications to the PSRC forecasts. Those ten projects are fully described in NEI's report. The description includes the type and location of the development, the FAZ and TAZ the development is located in, and the actual recommended impacts in population, number of households, and/or employment. The impacts were made at a TAZ level.

HISTORICAL TREND ANALYSIS

NEI analyzed AAPC rates for all FAZs in the four-county area in order to identify potentially anomalous patterns. The trend analysis contained PSRC actuals and forecasts

for population, number of households, and employment for 1970, 1980, 1990, 2000, 2010, 2020, 2030; the preliminary employment data from 2004; and the preliminary number of households and population data from 2005. The preliminary data was only available at the FAZ level.

Based on the trend analysis, recommendations were made in response to two types of anomalies. The first anomaly occurs when the 2010 PSRC forecast was significantly higher than the 2004/2005 preliminary data, indicating that the PSRC anticipated growth was too high. The second anomaly occurs when the 2004/2005 data exceeded the 2010, 2020, or 2030 PSRC forecast, indicating that the PSRC anticipated growth was too low. These two conditions are discussed below.

PSRC Forecast Growth Potentially Too High - If PSRC's 2010 forecast was significantly higher than the 2004/2005 actual for a given FAZ, NEI assumed that PSRC's 2010 forecast should be considered for a reduction. The reduction was calculated based on historical growth rates for the FAZ. NEI limited the AAPC for the period from 2004/2005 to 2010 to three times the historic AAPC from 1970 through 2004/2005.

This approach is shown in Table 3-5 and Figure 3-9 for the population of Shoreline, King County. Table 3-5 shows that the population decreased by an average 0.24 percent per year between 2000 and 2005. To achieve the PSRC 2010 forecast, the average annual rate of growth would have to total 1.39 percent between 2005 and 2010. The 1.39 percent AAPC creates a spike in the trend line, as shown by the red line in Figure 3-9. Compared to the 0.17 percent AAPC for the period from 1970 to 2005, the 1.4 percent AAPC is relatively large. NEI adjusted the population forecast for 2010 by capping the AAPC between 2005 and 2010 to three times the 0.17 AAPC exhibited between 1970 and 2005, which results in an AAPC of 0.5 for 2005 to 2010.

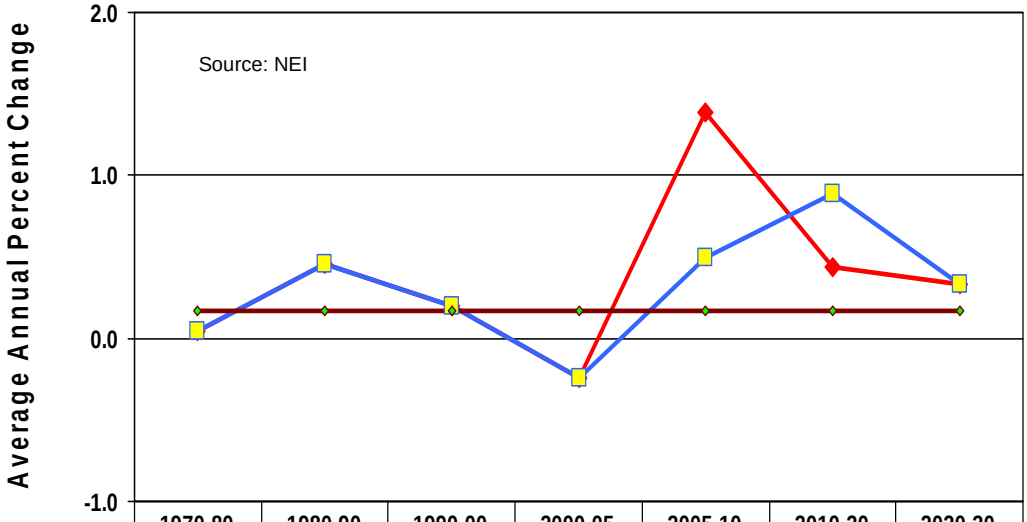
Table 3-5
Sample of NEI Adjustment To PSRC Forecasts For FAZ 6420, Shoreline, King County

	1970	AAPC	1980	AAPC	1990	AAPC	2000	AAPC	2005	AAPC	2010	AAPC	2020	AAPC	2030
PSRC Forecast	29,675	0.04	29,798	0.46	31,191	0.20	31,813	(0.24)	31,438	1.39	33,686	0.44	35,211	0.33	36,374
NEI Capped AAPC from 2005 - 2010										0.50					
NEI Popualtion Adjustment Adjustment											(1,462)		0		0
NEI Adjusted Forecasts										0.50	32,224	0.89	35,211	0.33	36,374
AAPC 1970 - 2005			0.17												

Source: NEI

The constrained growth by NEI from 2005 to 2010 resulted in a negative population adjustment of 1,462 people in 2010. The result is a total population of 32,224 people in Shoreline in 2010, compared to PSRC's original 33,686 total population. In cases where the PSRC 2010 forecast was potentially too high compared to the 2004/2005 preliminary data, NEI assumed that the PSRC forecast would be achieved by 2020. The impact of this approach was to slow the growth rate between 2004/2005 and 2010, and to increase the growth rate between 2010 and 2020. The growth rate between 2020 and 2030 would not be affected.

Figure 3-9
Trend Analysis in Population Growth Rates For Shoreline (FAZ 6420)



	1970-80	1980-90	1990-00	2000-05	2005-10	2010-20	2020-30
PSRC Forecasts	0.04	0.46	0.20	(0.24)	1.39	0.44	0.33
NEI Forecasts	0.04	0.46	0.20	(0.24)	0.50	0.89	0.33
1970 - 2005 AAPC	0.17	0.17	0.17	0.17	0.17	0.17	0.17

In summary, this approach controlled to PSRC's original 2020 and 2030 forecasts, and adjusted growth rates between 2004/2005 and 2010, and 2010 and 2020, to reflect the impacts associated with the recession in 2001. Trend-based adjustments were not applied if there were specific reasons a FAZ would be expected to achieve unusually high growth rates, such as a large land development.

Recommended adjustments were applied to TAZs within the FAZ. This was accomplished by distributing the impact proportionately among all the TAZs in the FAZ, according to their representation in the PSRC forecast for the appropriate year.

The majority of NEI's recommended changes to PSRC's forecasts were due to the trend analysis. Table 3-6 shows the number of TAZs that were modified based on the trend analysis where the annualized PSRC growth rate from 2004/2005 to 2010 was more than three times higher than the AAPC from 1970 to 2004/2005. The majority of modified TAZs were located in King County. The fewest changes were in Kitsap County. In Appendix B of NEI's report, all recommended changes by FAZ and TAZ are described, including the amount of the recommended change.

Table 3-6
Number of TAZs Modified in 2010 Based on NEI Trend Analysis
Where the PSRC Growth Rate is High compared to Trend

County	Employment	Households	Population
King (515 Total TAZs)	106	39	61
Kitsap (61 Total TAZs)	0	13	0
Pierce (206 Total TAZs)	27	34	55
Snohomish (141 Total TAZs)	12	11	9
Total (923 Total TAZs)	145	97	125

Source: NEI

PSRC Forecast Growth Potentially Too Low – If PSRC's 2010, 2020, or 2030 forecast was lower than the 2004/2005 data, then NEI adjusted the PSRC forecast value to equal the 2004/2005 data. At a minimum, all future years would be adjusted to the 2004/2005 level if they all fell below the 2004/2005 actual data. Table 3-7 shows the number of TAZs where NEI recommended changes based on PSRC growth that was too low. The majority of TAZs that were modified occurred in 2010, followed by 2020, and 2030. Out of the three variables – population, number of households, and employment -- employment-related changes were most prevalent in terms of the number of TAZs that were modified.

PRIOR CONSULTANT CHANGES

Mirai, working with Washington Department of Transportation, recently developed some adjustments to PSRC's 2030 forecast for a small number of TAZs. The adjustments were developed for population (22 TAZs), number of households (26 TAZs), and employment (20 TAZs). The modifications made by Mirai Associates largely resulted in a redistribution among TAZs within a FAZ, so the FAZs remained constant. The changes were focused on the Renton and Federal Way areas in King County. Mirai's recommended adjustments were reviewed and incorporated into NEI's adjustments.

SUMMARY OF METHODOLOGY

After the land development, trend analysis, and review of Mirai's adjustments were complete, a final review of the recommended changes was made. In a few cases, several methodologies impacted the same TAZ. When that occurred, the land development changes, followed by Mirai's recommended impacts, took precedence over trend-based changes.

Table 3-7
Number of TAZs Modified By Forecast Year Based on NEI Trend Analysis
When PSRC forecast for 2010, 2020 or 2030 was Lower than 2004/2005

	2010		
County	Employment	Households	Population
King (515 Total TAZs)	95	85	114
Kitsap (61 Total TAZs)	35	25	19
Pierce (206 Total TAZs)	66	44	40
Snohomish (141 Total TAZs)	34	1	6
Total (923 Total TAZs)	230	155	179

	2020		
County	Employment	Households	Population
King (515 Total TAZs)	45	9	48
Kitsap (61 Total TAZs)	13	0	7
Pierce (206 Total TAZs)	41	15	17
Snohomish (141 Total TAZs)	13	0	0
Total (923 Total TAZs)	112	24	72

	2030		
County	Employment	Households	Population
King (515 Total TAZs)	31	5	20
Kitsap (61 Total TAZs)	9	0	0
Pierce (206 Total TAZs)	22	3	6
Snohomish (141 Total TAZs)	8	0	0
Total (923 Total TAZs)	70	8	26

Source: NEI

NEI MODIFIED PSRC FORECASTS

This section summarizes the results of NEI's modifications to PSRC's forecasts at the county level for population, number of households, and employment. Recommended changes by FAZ and TAZ are provided in NEI's report in Appendix A (FAZs) and Appendix B (FAZs and TAZs).

Table 3-8 shows the total percent change in the PSRC forecasts due to recommended changes by NEI. In sum, employment levels decreased by 0.7 percent in 2010, increased by 1.1 percent in 2020, and increased by 0.7 percent in 2030. The decreases occurred in King and Snohomish counties. In 2010, PSRC employment forecasts decreased by 1.3 percent in King County, and 2.6 percent in Snohomish County. The recommended changes included net employment gains in Kitsap and Pierce counties of 5.6 percent and 1.3 percent, respectively.

Table 3-8
Total Percent Change in Forecasts by County and Variable

	Employment			Households			Population		
County	2010	2020	2030	2010	2020	2030	2010	2020	2030
King	(1.3)	1.0	0.6	1.1	1.3	1.3	1.7	1.7	1.6
Kitsap	5.6	3.3	2.8	(1.6)	0.0	0.0	1.8	0.2	0.0
Pierce	1.3	1.8	1.5	0.4	1.9	1.8	0.0	2.1	2.1
Snohomish	(2.6)	0.2	0.1	(0.6)	0.0	0.0	(0.1)	0.0	0.0
Total	(0.7)	1.1	0.7	0.4	1.1	1.1	1.0	1.3	1.2

Source: NEI

Changes in PSRC forecasts for population and number of households resulted in small positive increases in 2010, 2020, and 2030 for the four-county area. The PSRC forecasts for Kitsap and Snohomish counties only included decreases in forecasts for number of households. The 2010 PSRC forecast for number of households was reduced by 1.6 percent in Kitsap County and 0.6 percent in Snohomish County. The 2010 PSRC population forecast for Snohomish County was reduced by 0.1 percent.

NEI Employment Forecast

Table 3-9 and Figure 3-10 show NEI's forecasts by county, and compares them with PSRC's original forecasts. Table 3-9 shows PSRC's and NEI's forecasts for 2010, 2020 and 2030 for population, number of households, and employment. It also shows 2000 actuals, and the AAPC between each time period for both PSRC's and NEI's forecasts.

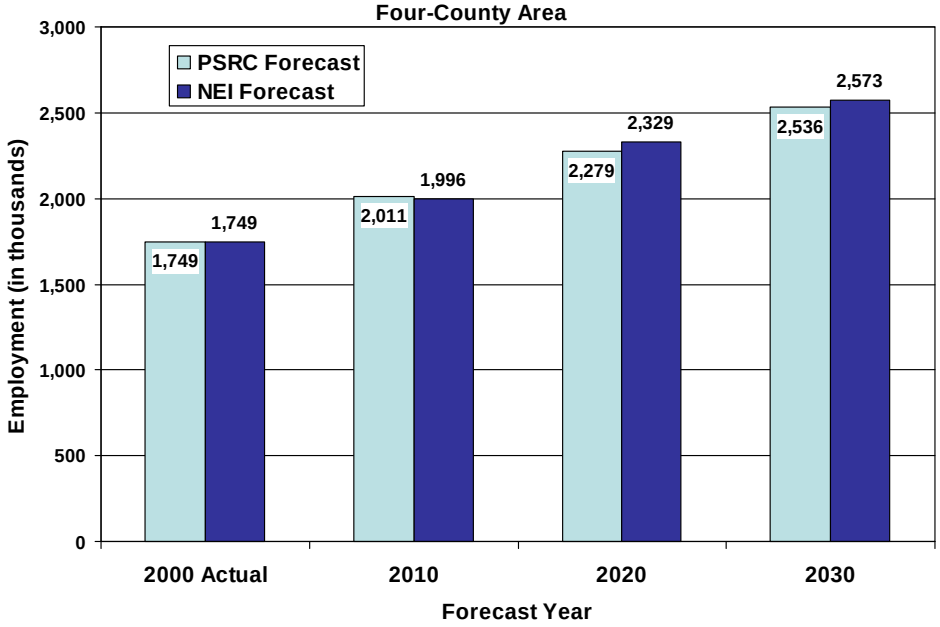
In 2010, PSRC's employment forecasts in the four-county area were reduced by approximately 14,700, including a decrease of 17,300 jobs in King County; a decrease of 6,700 jobs in Snohomish County; and an increase of 5,300 and 4,000 jobs in Kitsap and Pierce counties, respectively. In 2020, the four-county area PSRC employment forecasts were increased by 25,600 jobs, a 1.1 percent increase. Employment increases ranged from 15,200 jobs in King County, to 600 jobs in Snohomish County. In 2030, 18,700 jobs were added to PSRC forecasts in the four-county area, an increase of 0.7 percent. Increases by county ranged from 9,200 in King County to 400 in Snohomish County.

Table 3-9
Summary of Recommended Employment Forecast Adjustments by County

		Employment - in thousands							AAPC
County	Forecast	2000	AAPC	2010	AAPC	2020	AAPC	2030	2000- 2030
King	PSRC	1,188.6	1.3	1,351.2	1.2	1,516.9	1.0	1,670.8	1.1
	NEI Adjustment			(17.3)		15.2		9.2	
	NEI Forecast		1.2	1,333.9	1.4	1,532.1	0.9	1,680.0	1.2
Kitsap	PSRC	83.9	1.3	95.3	1.4	109.1	1.1	122.3	1.3
	NEI Adjustment			5.3		3.6		3.4	
	NEI Forecast		1.8	100.6	1.1	112.7	1.1	125.7	1.4
Pierce	PSRC	259.0	1.6	302.2	1.3	343.9	1.1	384.6	1.3
	NEI Adjustment			4.0		6.2		5.7	
	NEI Forecast		1.7	306.2	1.3	350.1	1.1	390.3	1.4
Snohomish	PSRC	217.3	1.9	261.9	1.7	308.7	1.5	358.2	1.7
	NEI Adjustment			(6.7)		0.6		0.4	
	NEI Forecast			255.2	1.9	309.3	1.5	358.6	1.7
Total	PSRC	1,748.8	1.4	2,010.6	1.3	2,278.6	1.1	2,535.9	1.2
	NEI Adjustment			(14.7)		25.6		18.7	
	NEI Forecast		1.3	1,995.9	1.4	2,304.2	1.0	2,554.6	1.3

Source: NEI

Figure 3-10
Employment Comparisons Between PSRC and NEI Forecasts
Four-County Area



NEI HOUSEHOLDS FORECAST

Table 3-10 and Figure 3-11 show NEI's and PSRC's forecasts for number of households. In 2010, PSRC's forecast for the number of households in the four-county area increased by approximately 6,300, including a decrease of 1,600 jobs in Kitsap County; a decrease of 1,700 jobs in Snohomish County; and an increase of 8,500 and 1,100 jobs in Kitsap and Pierce counties, respectively. This represents a 0.4 percent total increase in the number of households in the four-county area over the PSRC 2010 forecast.

In 2020, the total number of households in the four-county area increased above PSRC forecasts by 17,900, a 1.1 percent increase. Adjustments were made to the number of households in King and Pierce counties, while the number of households in Kitsap and Snohomish counties remained unchanged.

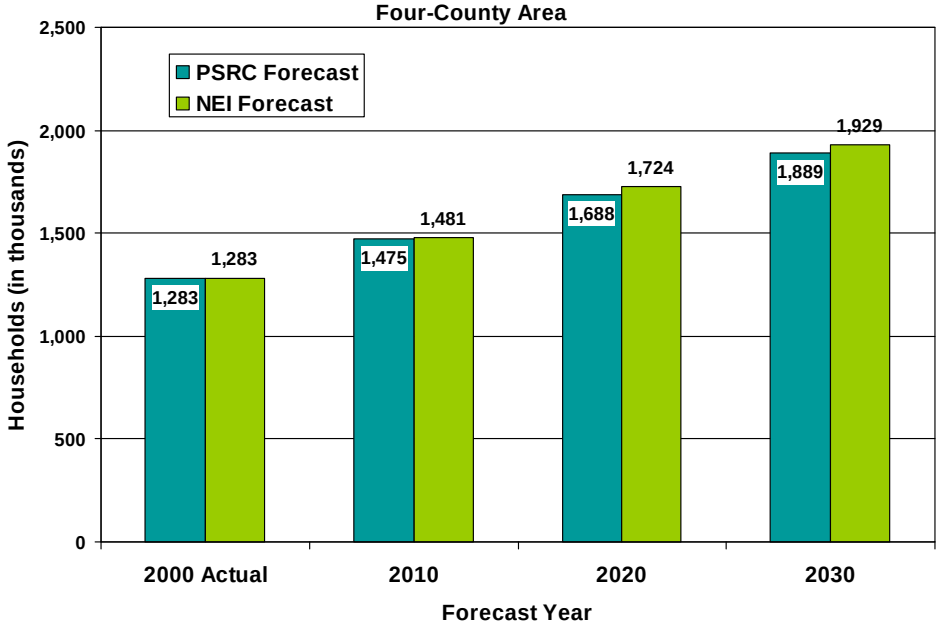
In 2030, the number of households increased by 20,100 in the four-county area, representing a 1.1 percent increase over the PSRC forecast. The number of households in King County increased by 12,700, and the number of households in Pierce County increased by 7,400. No net adjustments were made to Kitsap or Snohomish counties.

Table 3-10
Summary of Recommended Household Forecast Adjustments by County

		Households - thousands							AAPC
County	Forecast	2000	AAPC	2010	AAPC	2020	AAPC	2030	2000- 2030
King	PSRC	710.9	1.0	782.1	1.1	869.4	1.0	959.5	1.0
	NEI Adjustment			8.5		11.0		12.7	
	NEI Forecast		1.1	790.6	1.1	880.4	1.0	972.2	1.0
Kitsap	PSRC	86.4	1.6	101.3	1.7	119.6	1.3	136.3	1.5
	NEI Adjustment			(1.6)		0.0		0.0	
	NEI Forecast		1.4	99.7	1.8	119.6	1.3	136.3	1.5
Pierce	PSRC	260.8	1.7	310.2	1.5	360.4	1.1	400.2	1.4
	NEI Adjustment			1.1		6.9		7.4	
	NEI Forecast		1.8	311.3	0.2	367.3	0.1	407.6	1.5
Snohomish	PSRC	224.8	2.3	281.3	1.9	338.9	1.5	393.0	1.9
	NEI Adjustment			(1.7)		0.0		0.0	
	NEI Forecast		2.2	279.6	0.2	338.9	0.2	393.0	1.9
Total	PSRC	1,283.0	1.4	1,474.8	1.4	1,688.3	1.1	1,889.1	1.3
	NEI Adjustment			6.3		17.9		20.1	
	NEI Forecast		1.4	1,481.1	0.2	1,706.2	0.1	1,909.2	1.3

Source: NEI

Figure 3-11
Households Comparison Between PSRC and NEI Forecasts
Four-County Area



NEI POPULATION FORECAST

NEI's and PSRC's population forecasts are summarized and compared in Table 3-11 and Figure 3-12. The total population forecast in 2010 for the four-county area was increased by approximately 35,400, including increases of 31,200 people in King County; 4,800 people in Kitsap County; 100 people in Pierce County; and a decrease of 700 people in Snohomish County. This represents a 1.0 percent total increase in the number of households in the four-county area over the PSRC forecast.

In 2020, the population in the four-county area increased above PSRC forecasts by 54,700 people, a 1.3 percent increase. Net population increases totaled 34,600 people in King County; 500 people in Kitsap County; and 19,600 people in Pierce County. The net population in Snohomish County remained unchanged.

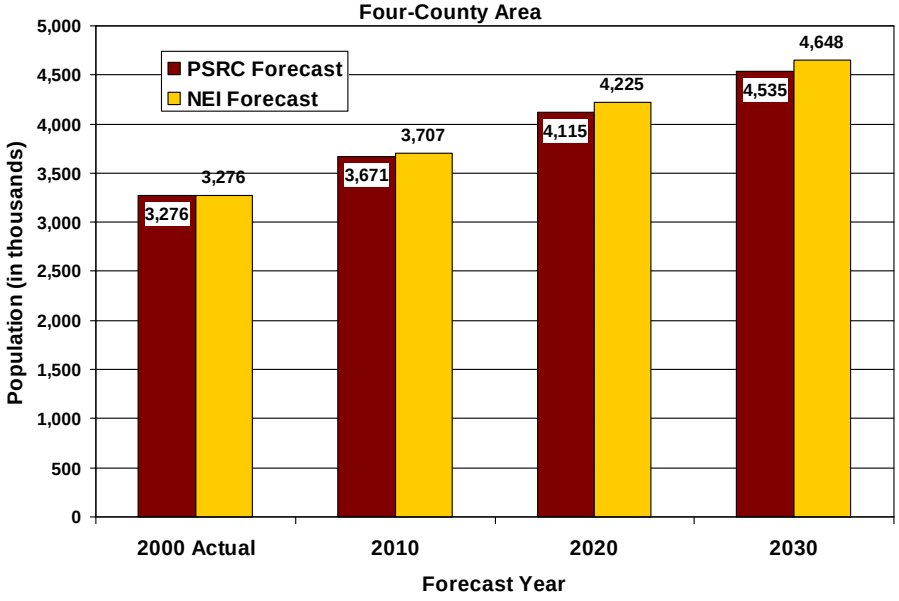
The population in 2030 increased by 56,100 people in the four-county area, representing a 1.2 percent increase over the PSRC forecast. King County's population increased by 35,500 people, and Pierce County's population increased by 20,900 people. No net adjustments were made to Kitsap or Snohomish Counties.

Table 3-11
Summary of Recommended Population Forecast Adjustments by County

		Population - Thousands							AAPC
County	Forecast	2000	AAPC	2010	AAPC	2020	AAPC	2030	2000- 2030
King	PSRC	1,737.0	0.7	1,869.5	0.9	2,039.5	0.8	2,202.4	0.8
	NEI Adjustment			31.2		34.6		35.5	
	NEI Forecast		0.9	1,900.7	1.0	2,074.1	0.9	2,237.9	0.8
Kitsap	PSRC	232.0	1.2	262.5	1.4	301.5	1.2	339.9	1.3
	NEI Adjustment			4.8		0.5		0.0	
	NEI Forecast			267.3	1.2	302.0	1.2	339.9	1.3
Pierce	PSRC	700.8	1.4	806.1	1.3	914.1	1.0	1,007.6	1.2
	NEI Adjustment			0.1		19.6		20.9	
	NEI Forecast		1.4	806.2	1.5	933.7	1.0	1,028.5	1.3
Snohomish	PSRC	606.0	1.9	733.2	1.6	860.2	1.4	985.2	1.6
	NEI Adjustment			(0.7)		0.0		0.0	
	NEI Forecast		1.9	732.5	1.6	860.2	1.4	985.2	1.6
Total	PSRC	3,275.8	1.1	3,671.2	1.1	4,115.3	1.0	4,535.1	1.1
	NEI Adjustment			35.4		54.7		56.4	
	NEI Forecast		1.2	3,706.6	0.1	4,170.0	0.1	4,591.5	1.1

Source: NEI

Figure 3-12
Population Comparisons Between PSRC and NEI Forecasts
Four-County Area



APPLICATION OF NEI MODIFIED PSRC FORECASTS

PSRC socio-demographic forecasts, published in 2004, consist of population, number of households, and employment for years 2010, 2020 and 2030. The forecasts were reviewed and modified by NEI to reflect updated information. The modified forecasts were provided to Mirai Associates, a transportation engineering and planning firm, who developed new traffic trip tables for years 2010, 2014 and 2030. These trip tables reflect the traffic demand and travel patterns in the study area with the socio-demographic modifications made by NEI. The trip tables were used in the modeling process to more accurately estimate the potential usage of the proposed I-405 Express Toll Lanes.

CHAPTER 4

STATED PREFERENCE SURVEY

Resource Systems Group, Inc. (RSG) developed and implemented a stated preference survey to gather information from passenger car motorists who either currently or could potentially travel on I-405 from SR 520 north to I-5. The primary purpose of the survey was to collect information from motorists to determine their willingness to pay tolls and their likelihood of using the express toll lanes. Specifically, the survey results were used to develop a distribution of values of time for motorists who either use or could use the proposed I-405 express toll lanes. Value of time (VOT) was determined by purpose of the trip, time of day, and travel characteristics of the motorists. Acquiring this data was very important because the ways in which motorists value time is integral to estimating their willingness to pay a toll.

RSG documented its findings in a report titled *I-405 Managed Lanes Stated Preference Survey*, dated August 2, 2006. At the time the stated preference surveys were conducted, the proposed express toll lanes were being called High Occupancy Toll (HOT) Lanes, a type of managed lanes. This chapter, which describes the work and findings of RSG, retains the nomenclature HOT lanes to describe the express toll lanes.

- **Survey Administration and Sample Size** – Describes the way the survey was conducted; where it was conducted; and the sample sizes.

- **Survey Questionnaire** – Describes the survey questions, and how they relate to estimating the sample population's value of time.

- **Survey Results** – Summarizes the demographic and travel characteristics of the survey participants; summarizes the results of the debriefing questions, which related to the participant's opinions of the HOT lanes project; and summarizes the results of the statistical analysis that was used to estimate the values of time of participants who are likely to use the HOT lanes.

- **Application of RSG Stated Preference Surveys** – Summarizes how the results of the stated preference surveys are used in the rest of the study.

SURVEY ADMINISTRATION AND SAMPLE SIZE

The stated preference survey was conducted from April 2, 2006, to April 28, 2006, using a combination of on-site intercept surveys and internet surveys. A total of 2,592 surveys were completed, consisting of 1,376 on-site intercept surveys, and 1,216 internet surveys. Survey operations were monitored continuously to assure that minimum desired sample sizes were achieved within target categories, such as time period (peak, shoulder, and off-peak), trip purpose (work and non-work), occupancy (Single Occupancy Vehicle and High Occupancy Vehicle (HOV)), trip distance, and demographics.

ADMINISTRATION AT INTERCEPT SITES

Intercept surveys were conducted from April 3, 2006, to April 13, 2006, resulting in 1,376 completed surveys. Intercept sites were selected to locate a high volume of I-405 corridor travelers that represented a broad cross-section of the total population. Sites were selected that were likely to attract motorists making work and non-work trips, and single-occupant and multi-occupant trips. Intercept Surveys were conducted at the following locations:

- University of Washington, Seattle Campus;
- Evergreen Hospital Galleria;
- Bellevue City Hall;
- Bothell Department of Licensing;
- Kirkland Department of Licensing;
- Bellevue Department of Licensing;
- Fred Meyer Shopping Center; and
- Kirkland Senior Center.

An easel-mounted poster was positioned near the interview station to assist in attracting participants. Surveys were administered on laptop computers. Each survey site was staffed by three attendants who were responsible for soliciting and screening potential participants and assisting with use of the computers. Most participants completed the survey in approximately ten to 15 minutes. All responses were automatically saved in a database.

INTERNET-BASED SURVEY ADMINISTRATION

Internet surveys were conducted from April 5, 2006, to April 28, 2006, resulting in 1,216 completed forms. These surveys were administered to employees of large businesses and subscribers to the electronic Washington State Department of Transportation (WSDOT) I-405 Newsletter. In total, 81 surveys were completed by subscribers to the WSDOT I-405 Newsletter; three surveys were completed by employees of the City of Bellevue; 1,030 surveys were completed by employees of Boeing Corporation; and 102 surveys were completed by readers of the Seattle Times.

The WSDOT I-405 Newsletter is sent electronically to registered individuals who had expressed an interest in receiving news and information about the I-405 corridor. Registered members were invited to participate in the survey on April 5, 2006. The City of Bellevue and Boeing Corporation are two key companies with offices located in the study corridor. Their employees are likely to use I-405 for travel. Both companies issued email invitations to their employees inviting them to participate in the survey. The City of Bellevue employees were contacted during the week of April 2, 2006, and Boeing Corporation employees were contacted on April 23, 2006. Seattle Times readers learned about the survey through an article printed in the Seattle Times on April 10, 2006. The readers were given a dedicated portal to the survey with a limited time for completion.

SURVEY QUESTIONNAIRE

Potential survey participants were screened prior to and during the survey to ensure they were eligible. To qualify, an individual had to be at least 16 years old, who made a trip of at least three miles within the past month that used, or could have used, a portion of I-405 between SR 520 north to I-5. In addition, an individual would have to be eligible to pay a toll to use HOT lanes. For the purposes of this study, it was assumed that eligibility to buy into the HOT lane (pay a toll) required that the individual drive a single-occupant or double-occupant passenger car, light truck, or motorcycle, without a trailer. It was further assumed that individuals who drive large trucks would not be eligible to pay a toll to use HOT lanes, and passenger cars with more than two occupants would be permitted to use the HOT lanes without paying a toll.

Once screened for eligibility, participants were asked to complete the survey. They were asked to focus on their most recent trip in the I-405 corridor. The survey was divided into four main sections:

- Trip Description;
- Hot Lanes Information;
- Stated Preference Questions; and
- Debrief and Demographic Questions.

The text of the actual survey questions is included in Appendix A of RSG's report. Sample screens from the surveys administered by computer are shown in Appendix B of RSG's report.

TRIP DESCRIPTION

In this section, participants were asked to provide details of their most recent trip in the I-405 corridor, including:

- Vehicle occupancy;
- Vehicle type;

- Trip purpose;
- Day the trip occurred (Monday through Sunday);
- Time the trip started; and
- Whether the HOV lane was used.

In addition, participants indicated on a map where their trip started and ended, and what roads they used on their trip. The participants were also asked to identify the entry and exit ramps they used; the total travel time; the travel time on I-405; and how much additional time they allowed for possible congestion on the roads.

Participants who could have used I-405 as part of their trip were asked for their total travel time. They were also asked to consider a hypothetical trip using I-405, with the same origin and destination as the actual trip they made without using I-405. Based on the hypothetical trip, they were asked to identify their likely entry and exit ramps on I-405; estimate their travel time on I-405; and estimate their total travel time on the local roads they would use to get to and from I-405 to their destination.

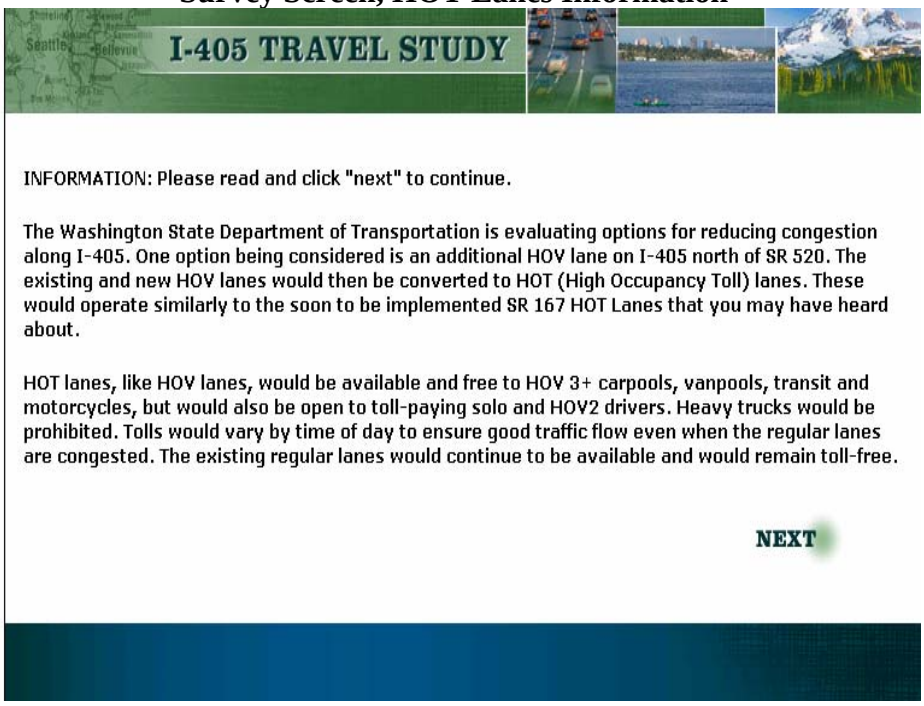
Data from RSG's TransCAD roadway network was used to validate travel times for the route described by participants. When a reported travel time was outside a range of anticipated travel times for a specific trip, the participant was asked to confirm the travel time. This confirmation was intended to prompt the participant to re-examine his or her reported travel time if it deviated from an established normal range. During the survey validation process, surveys would be discarded if reported travel times were significantly outside an anticipated range of travel times.

Responses to the trip description questions were used later in the survey to develop customized travel scenarios for each participant. How these customized questions were used is explained in the section on Stated Preference Questions.

HOT LANES INFORMATION

Before beginning the stated preference exercises, participants were presented with information about the I-405 HOT lanes. Information was also presented about the non-stop electronic tolling that would be used on the HOT lanes. Figure 4-1 shows a sample image of the HOT lanes information section of the survey.

Figure 4-1
Survey Screen, HOT Lanes Information



STATED PREFERENCE SCENARIOS

In this section of the survey, participants were asked to consider eight hypothetical travel scenarios. In each scenario, participants were asked to choose between two travel options:

- Use the participant's current toll-free route; or
- Use the HOT lanes for a specified toll.

In each scenario, the first alternative presented the travel time and potential delay based on the participant's current toll-free route, whether using the I-405 regular lanes, or using an alternate route.

The second alternative in each scenario presented the participant with a hypothetical travel time, potential delays, and a toll cost using the HOT lanes for the same trip as the first alternative (the same origin and destination, but incorporating the HOT lanes as part of the route). Potential delays that could be expected to occur in one of ten trips were presented to the participant to illustrate the degree of travel-time reliability that could be anticipated in the HOT lanes for the particular trip.

Figure 4-2 shows a sample stated preference scenario for a motorist who currently uses an alternate route to I-405 for a weekday work-related trip. Red text was used to highlight information that varied from one scenario to the other. The current trip takes 35 minutes, and one in ten trips takes 55 minutes or longer. The trip has no toll costs. The hypothetical alternative trip, using the HOT lanes, is described as taking 28 minutes, with a one in ten occurrence of taking 37 minutes or longer. The participant was asked to choose between the two trips.

Figure 4-2
Survey Screen, Example Scenario – Current I-405 User

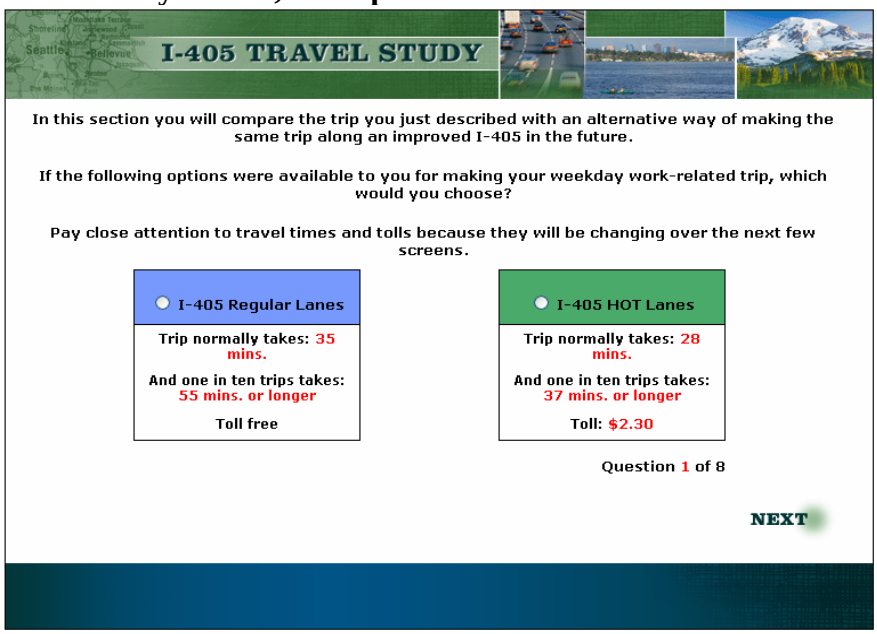
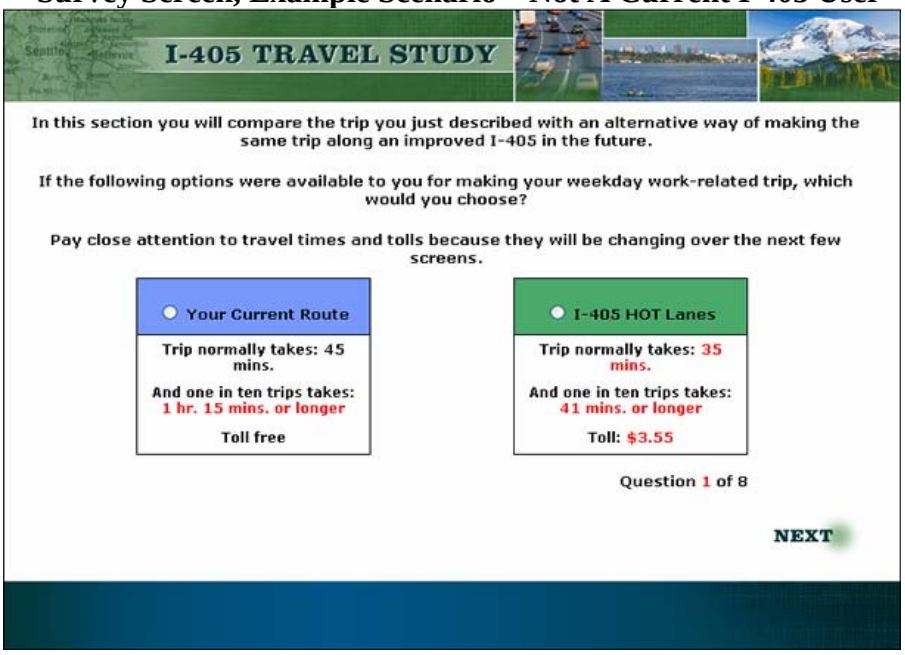


Figure 4-3 shows an example of a scenario for a motorist who currently uses the regular I-405 lanes for a weekday work-related trip. The current trip takes 45 minutes, and one in ten trips takes one hour and 15 minutes or longer. The trip is toll-free. The hypothetical trip, using the HOT lanes, is described as taking 35 minutes, with a one in ten occurrence of taking 41 minutes or longer. The trip would cost $3.55 in tolls.

Figure 4-3
Survey Screen, Example Scenario – Not A Current I-405 User



The scenarios that were developed had to be believable to the participants. The travel times, reliability, and time of day of the trips using either the I-405 regular lanes or an alternate route were based on the participant's own reported trip. Toll costs, travel times, and reliability of the I-405 HOT lane alternative were customized for time of day and distance traveled. For participants who did not travel on I-405, a hypothetical trip was constructed using the participant's origin and destination, as well as probable entry and exit ramps.

The travel time, reliability in travel time (the time the trip takes in one out of ten trips), and the toll cost was varied in each scenario. The alternative trip was generated based on a range of travel speeds and per-mile toll costs. All of the variables were created using a randomly selected experiment from a set of 32 experiments that were generated from an orthogonal design, a commonly used experimental design method. The design criteria are described in Appendix A of RSG's report.

By presenting each participant with the eight scenarios, the experimental design allows the estimation of the travel-time savings necessary to warrant the toll cost for each participant. The final product of the survey effort is a distribution of values of time for each survey participant. This information is shown in the section titled *Value of Time Savings Estimation*.

DEBRIEF AND DEMOGRAPHIC QUESTIONS

After the stated preference section, participants were asked questions relating to their general concept of HOT lanes. These questions were followed by a series of demographic questions.

Participants who never selected the HOT lanes, or chose them only once, were asked to indicate their primary reason for not choosing them. Participants who chose the HOT lanes at least once were asked to provide reason(s) for their selection. The choices included:

- Saves time;
- More reliable travel time;
- Less congestion; and
- Other (write in answer).

A randomly selected group of participants who traveled in HOVs with two occupants (HOV2) were asked how they would change their behavior if HOT lanes were free to carpools of three or more occupants only. The remaining HOV2 participants were asked how they would behave if HOT lanes were free to two-person carpools, but single occupant cars could use the HOT lanes for a fee. In addition, participants were asked their overall opinion of the HOT lanes and which resources they used to gain information on local traffic conditions.

The final section of the survey consisted of a series of questions regarding demographics such as household size, number of household vehicles, gender, age, employment status, and income. This information was used to determine differences in responses among different traveler segments and to support model estimation.

SURVEY RESULTS

This section summarizes the demographic, travel characteristics, and debriefing questions from the participants. The results of the statistical analysis of the stated preference questions are also presented in this section. A statistical model was used to estimate the value of travel time savings of potential users of the I-405 HOT lanes.

A total of 2,592 participants completed the survey. Approximately half of these (53 percent) were completed at the intercept sites, and the remaining 47 percent were completed through the internet. Outliers in the data set were identified in several ways, including identification of extreme values in the input data and post-estimation identification of responses with low choice probabilities. Participants who reported one-way travel times of more than three hours were excluded from the analysis, as were participants who did not currently use I-405. As a result, data from 87 participants was

excluded, and data from 2,505 participants (97 percent) was used to estimate the model results.

The following summaries of demographics, travel characteristics, debriefing questions, and stated preference results are based on the 2,505 participants whose answers were used to estimate the model results.

Demographic and Travel Characteristics

This section summarizes a sample of the demographic and travel characteristics obtained through the survey. A tabulation of each of the survey questions is included in Appendix C of RSG's report.

The gender distribution in the sample was 65 percent male and 35 percent female. A majority of the participants (86 percent) were employed either full time, part time, or self-employed. The median age of the participants fell into the 35 to 44 year old range, and the largest sample of participants, approximately 33 percent, fell into the 45 to 54 year old range. Figure 4-4 shows the annual household income, with 29.8 percent of all participants reporting an annual household income within the $50,000 to $84,999 range.

Figure 4-4
Annual Household Income
2,484 Respondents

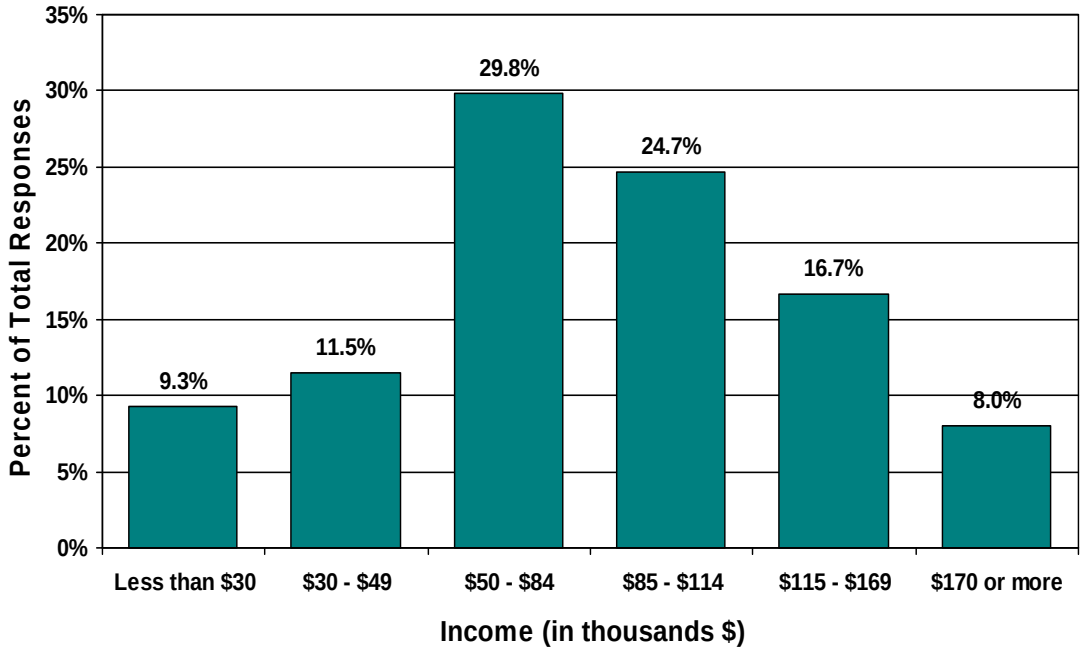


Figure 4-5 shows trip purpose distributions. Fifty-one and a half percent of all participants described a commute trip, and another 12.8 percent described a business-related trip.

Figure 4-5
Trip Purpose Distribution
2,505 Respondents

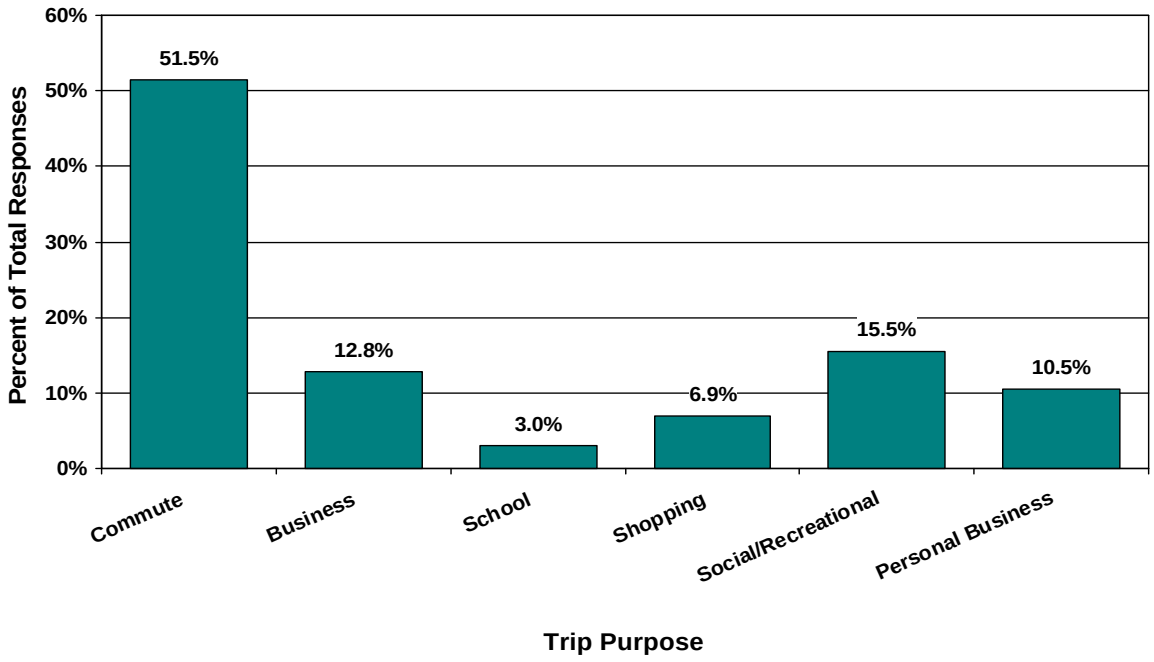


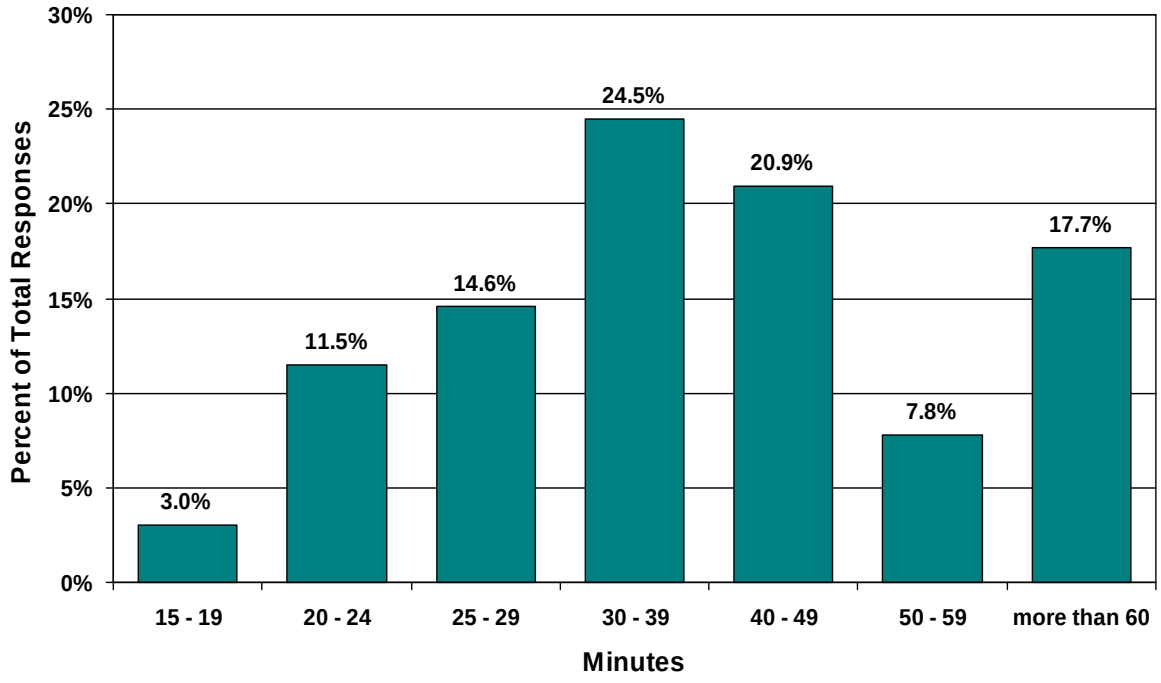
Table 4-1 shows the trip frequency distribution. A large proportion, 48.7 percent, of the participants indicated that they completed the trip four or more times per week; 24.5 percent completed the trip between one to three times per week; 15.8 percent completed the trip between one and three times per month; and 11.0 percent completed the trip less than one time per month.

Table 4-1
Trip Frequency Distribution
of Respondents

Trip Frequency	Percent
6 or more per week	8.5
4 - 5 per week	40.2
2 - 3 per week	13.8
1 per week	10.7
1 - 3 per month	15.8
Less than 1 per month	11.0
Total	100.0

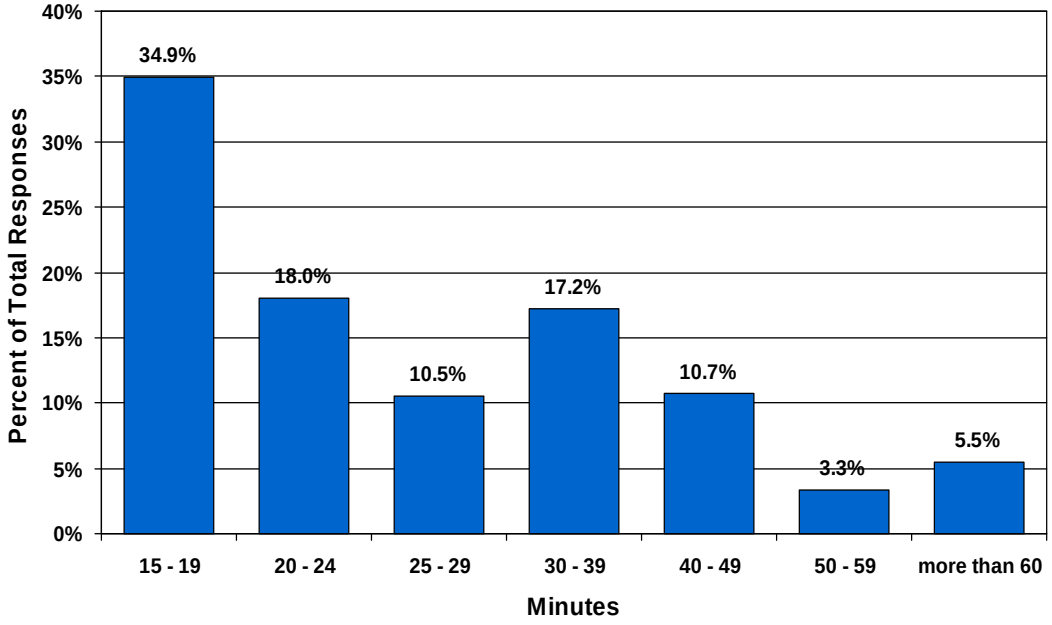
Participants were asked their total travel time for the trip they described. Figure 4-6 shows the total reported travel time by category for all trips that used a portion of I-405, including time spent on local roads. A significant amount of participants, 24.5 percent, reported trips that took between 30 and 39 minutes, while another 20.9 percent described trips that took between 40 and 49 minutes. Almost 18 percent of participants reported trips totaling more than 60 minutes.

Figure 4-6
Total Travel Time
2,505 Respondents



Participants were also asked their total travel time on I-405 only, excluding any local roads used. Figure 4-7 shows these results. To be eligible for the survey, travel time on I-405 was required to total at least 15 minutes. It was assumed that people who engaged in very short trips on I-405 would not use the HOT lanes either due to the location of access points, or because the time savings would not justify the toll cost. Almost 35 percent of all responses were in the 15 to 19 minute category. Approximately 63 percent of all trips totaled between 15 and 30 minutes. Only 5.5 percent of reported trips were longer than 60 minutes.

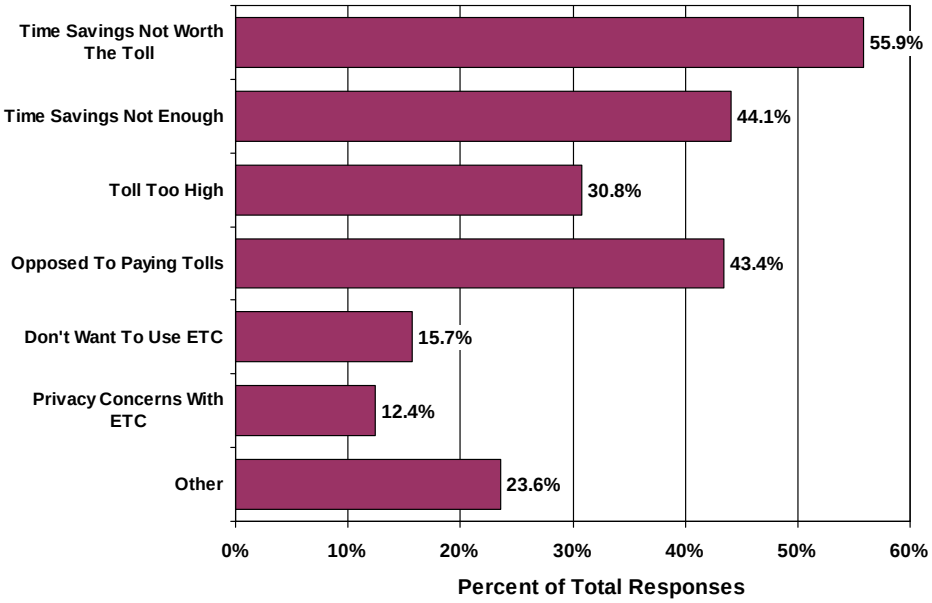
Figure 4-7
Travel Time on I-405
2,505 Responsdents



DEBRIEFING QUESTIONS – REACTION TO I-405 HOT LANES

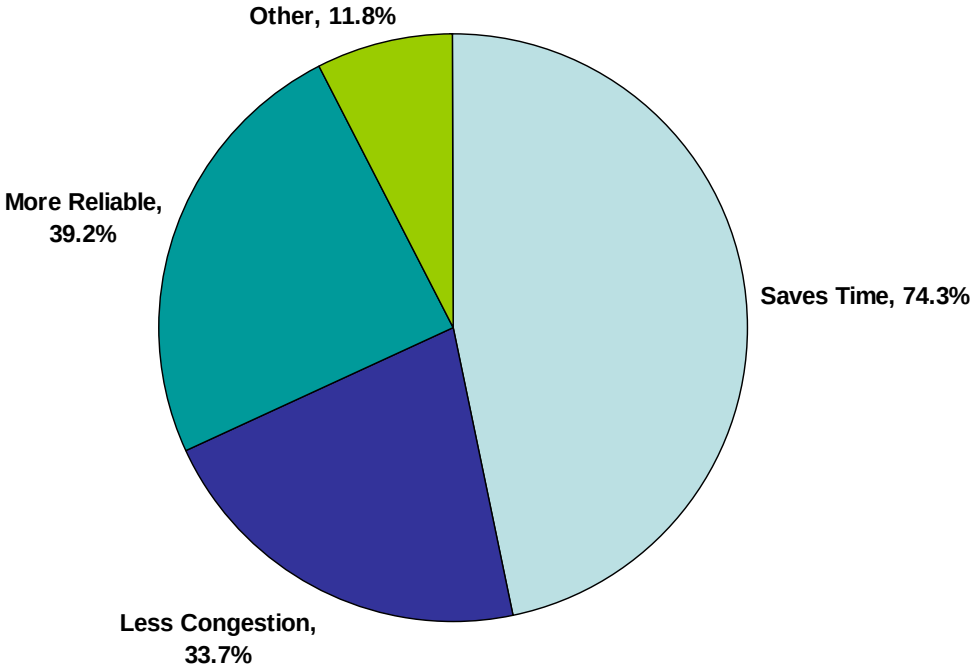
A total of 1,178 participants who never selected the HOT lanes option or who chose it only once in the stated preference section were asked why they avoided it. The participants were instructed to select all of the reasons that applied. Figure 4-8 shows the results. The most frequently selected option (55 percent of all responses) was "Time savings is not worth the toll cost."

Figure 4-8
Why Didn't You Choose the HOT Lanes Option? - (Select All That Apply)
1,178 Respondents



A total of 1,556 participants who selected the HOT lanes option at least once were asked to provide their reasons for choosing it. The participants were instructed to select all of the reasons that applied. A total of 2,474 responses were recorded. Figure 4-9 shows that the most popular response (74.3 percent of all responses) was "Saves Time." The second most popular response (39.2 percent of all response) was "More Reliable," followed by "Less Congestion" (33.7 percent of all responses). The option titled "Other" represented 11.8 percent of all responses.

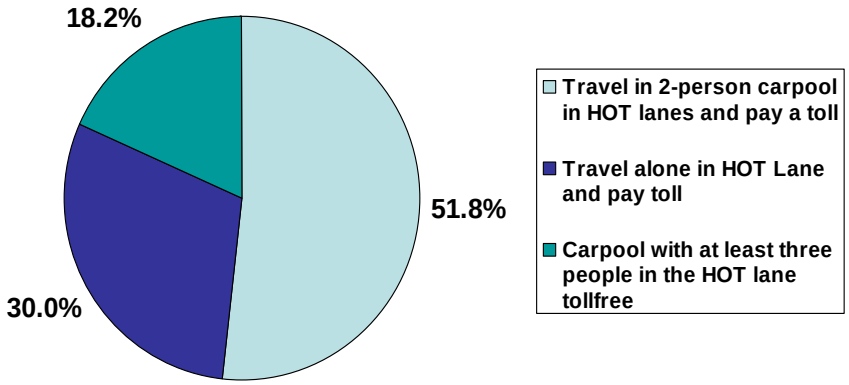
Figure 4-9
Why Did You Choose the HOT Lanes Option? (Select All That Apply)
1,556 Respondents



HOV2 participants who selected the HOT lanes option in the stated preference section were randomly separated into two groups. Participants in the first group were asked to select their likely behavior if the HOT lanes could be used by HOVs with three or more occupants (HOV3+) for free, and HOV2 carpools would be required to pay a toll. As part of the question, a toll rate was shown to the participant. The toll rate was customized to the individual participant, and represented the highest toll at which the HOT lanes were selected in the stated preference section.

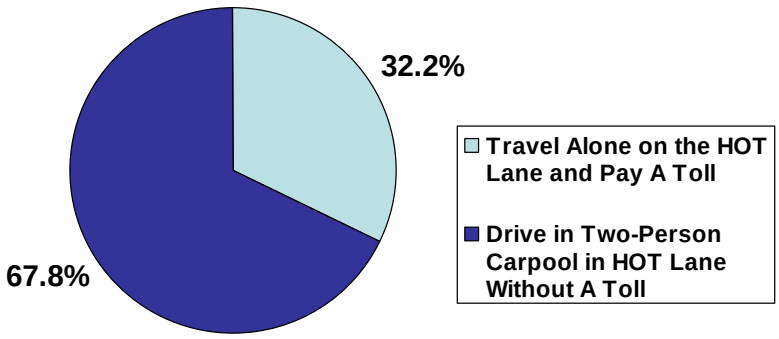
Figure 4-10 shows that 51.8 percent of the 110 participants in this group said that they would travel in a two-person carpool in the HOT lanes and pay the toll. Thirty percent said that they would travel alone in the HOT lanes and pay the toll. The remaining 18.2 percent said that they would travel in the HOT lanes in a three-or-more person carpool and travel toll free.

Figure 4-10
HOV2 Motorists' Likely Choice In Future If In HOT Lanes HOV2 Carpools Are Tolled and HOV3+ Carpools Are Toll Free
110 Respondents



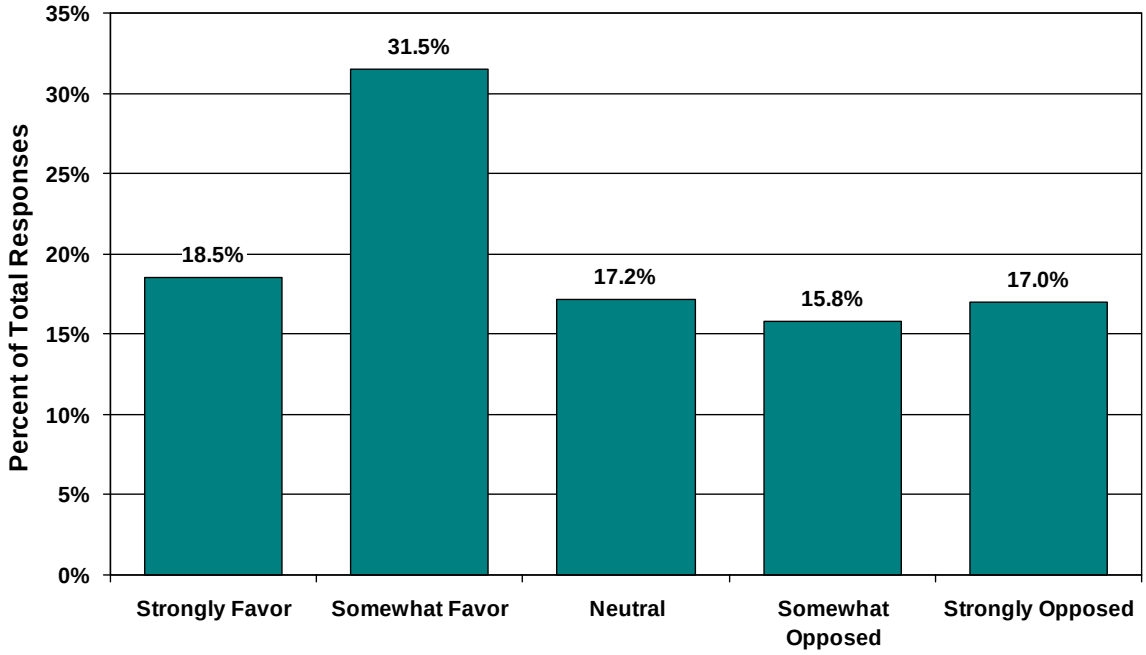
The second group of HOV2 participants was asked to select their likely behavior if the HOT lanes could be used by a two-person carpool for free, or a Single Occupancy Vehicle that could pay a toll. Figure 4-11 shows the results.

Figure 4-11
HOV2 Motorists' Likely Choice Using HOT Lanes If HOV2 Carpools Travel Toll Free
143 Respondents



All participants were asked to indicate their opinion of the HOT lanes. Figure 4-12 shows that 49.9 percent of all participants either strongly favored or somewhat favored the HOT lanes. Almost one-third of participants were opposed to the HOT lanes, and the remaining 17.2 percent were neutral.

Figure 4-12
Opinion of I-405 HOT Lanes Project
2,505 Respondents



VALUE OF TIME SAVINGS ESTIMATION

Each of the eight scenarios provided participants with two alternatives for travel:

- Use the participant's current toll-free route; or
- Use the HOT lanes for a specified toll.

Data from the stated preference surveys were expanded into a dataset. Outliers in the dataset were excluded from the model estimation, resulting in a dataset that contained eight observations for each of the 2,505 participants, yielding a total of 20,040 observations.

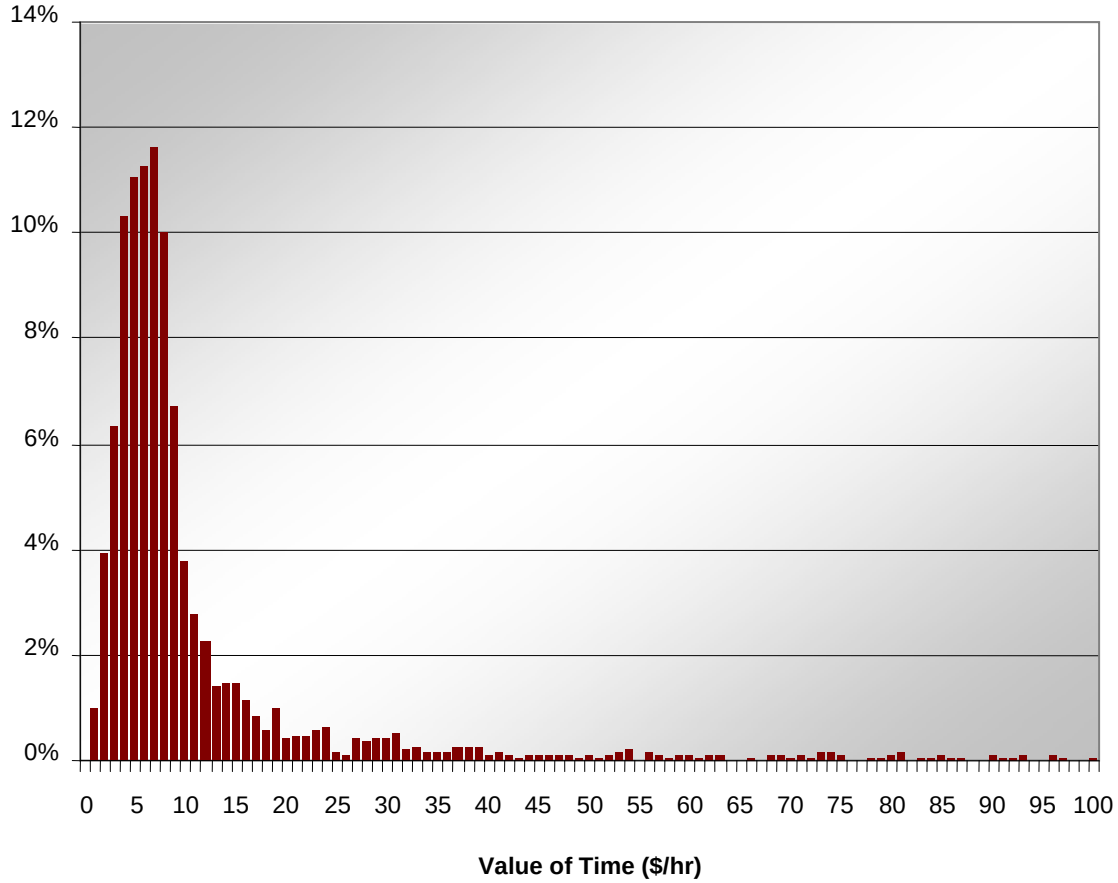
RSG used two modeling approaches. The first was an aggregate estimation model, which was used to support estimation of the coefficients of a multinomial logit choice model.[1] This estimation model was used to determine the details of the model specification (which coefficients and effects, such as income, to include in the model). The model includes four coefficients consisting of a total travel time coefficient that is applicable to both alternatives; a toll cost coefficient with an income effect that is applicable to the managed lanes alternative; and two alternative specific constants. A complete description of the model structure and coefficients can be found in RSG's report.

The value of time for the sample in the aggregate model is $9.65 per hour, calculated for a household income of $67,500, which is the midpoint of the median income category of the survey participants. This is the estimated value of time for a participant with an income at the median household income. It equates to a value of time of $0.161 per minute.

The Hierarchical Bayes method was the second model approach used to estimate the individual values of time for each participant. This approach uses the same model specifications (the same coefficients and effects) as the aggregate model, but estimates separate coefficients for each participant in the dataset. This allows for more individual preferences to come through, and provides individual values of time, which are derived from the individual time and cost coefficients. The marginal rate of substitution of each participant's travel time and toll cost coefficient was used, along with the participant's reported household income, to provide a value of time for each participant in the sample. The sample exhibited a wide range of values of time, with a median value of time of $6.60 per hour for the entire sample. Figure 4-13 shows these results.

[1] The multinomial logit model has the general form, $p(i) = \frac{e^{U_i}}{\sum_{AllModes} e^{Uj}}$, where *p(i)* is the probability that mode i will be chosen and U_i is the "utility" of mode i, a function of service and other variables. See, for example, M. E. Ben-Akiva and S. R. Lerman, *Discrete Choice Analysis*, MIT Press, 1985, for details on the model structure and statistical estimations procedures.

Figure 4-13
Distribution of Individual Values of Time



The top one percent of values of time among 24 participants is outside of the distribution shown in Figure 4-13, and those values are between $101 and $360 per hour. The average (mean) of the individual values of time from the Hierarchical Bayes methods was estimated at $11.87 per hour, or $0.20 per minute. Similar to the aggregate model, this estimate has an income effect and each participant's value of time takes into account both the individual preference coefficients and the reported household income for that participant.

APPLICATION OF RSG STATED PREFERENCE SURVEYS

RSG conducted stated preference surveys that were used to develop a distribution of values of time for motorists who currently use or could potentially use I-405 within the study area. The values of time distribution reflected the survey responses of each of the 2,505 respondents under eight different observations, resulting in 20,040 total observations. The distribution of estimated values of time for I-405 motorists in the study area is shown in Figure 4-12.

The values of time distribution was used directly in the modeling process to determine the number of vehicles with single occupants willing to buy into the HOT lanes for any combination of toll rate and time savings offered by using the HOT lanes. The model estimated the "cost of time saved" by dividing the toll cost by the time savings a motorist accrued from use of the HOT lanes for a particular trip. The proportion of motorists with a value of time greater than or equal to the "cost of time saved" was assigned to the HOT lanes. The proportion with a value of time less than the "cost of time saved" was assigned to the toll free routing. This process is discussed more fully in Chapter 5, in the section Modeling Approach.

CHAPTER 5

ESTIMATED TRAFFIC AND TOLL REVENUE

This chapter provides the traffic and gross toll revenue estimates for the proposed express toll lanes along I-405 from SR 520 north to I-5. The estimates are for the Base Case scenario and the three sensitivity tests that were conducted as part of this study. The traffic and toll revenue estimates were developed for the years 2010 (the assumed opening year of the express toll lanes) through 2030. Figure 1-2 in Chapter 1 of this study shows the Base Case express toll lanes configuration.

The first sensitivity test assumed that all Single Occupant Vehicles (SOVs) were prohibited from using the NE 128th Street direct access. This access would be used by High Occupancy Vehicles (HOVs) only. The second sensitivity test analyzed the impact of extending the express toll lanes to the NE 6th Street direct access interchange. The third sensitivity test estimated the combined impact of prohibiting SOVs at NE 128th Street, and extending the express toll lanes to NE 6th Street.

This chapter provides an overview of the modeling process used to develop estimates of express toll lane usage, including key inputs and basic study assumptions. The following section identifies the estimated toll rates necessary to maintain free-flow conditions in the express toll lanes. The associated mix of HOV and SOV traffic using the express toll lanes is described for each of the analysis years -- 2010, 2014, 2020 and 2030. Toll revenue estimates are be provided on an annual basis and by time of day, for the Base Case scenario. Additional information is provided for estimated express toll lane traffic usage and annual toll revenue for each of the three sensitivity tests that were conducted. Lastly, observations are made regarding:

- Express toll lane mainline and access point operations;
- SOV response to tolling during congested peak periods; and
- Peak period spread of express toll lane demand.

In this study, average toll rates and annual gross toll revenue estimates are provided in both *current dollars* and *constant 2007 dollars*. Current dollars are defined as the dollar value at the time of the purchase, so the estimated annual toll revenue in 2010 reflects the value of the toll revenue in 2010 dollars. Constant dollars reflect the dollar value adjusted to a base year to eliminate changes in price due to inflation. For example, if a latte cost

$5.00 in 2007, and the price remained $5.00 in 2010 (current dollars), the latte would actually cost $4.64 in constant 2007 dollars assuming a 2.5 percent annual rate of inflation.

MODELING APPROACH

Three levels of analysis were used to estimate traffic and toll revenue for the I-405 express toll lanes:

- **Global Demand Estimates** – Global demand is an estimate of the amount of traffic using the I-405 corridor under existing and improved conditions. These estimates were based on a combination of existing Puget Sound Regional Council (PSRC) modeling information and an independent economic assessment of growth for the region that was performed by Northern Economics, Inc. (NEI) as part of this study.

- **Travel Time Simulation Model (VISSIM)** - A VISSIM (version 4.10 by PTV America) traffic model of the I-405 corridor was developed to identify changes in travel time and delay in different segments of the General Purpose (GP) lanes at different traffic loads. The Washington Department of Transportation (WDOT) developed the VISSIM model of I-405. Wilbur Smith Associates (WSA) modified the model to reflect the proposed express toll lanes and other I-405 system improvements.

- **Market Share Micro-Model (Micro-Model)** - The market share micro-model estimates the share of traffic that would use the express toll lanes instead of the GP lanes or other alternate routes. The estimated amount of traffic using the express toll lanes is based on several factors including overall demand in the corridor; location of access points to the express toll lanes; values of time; excess capacity remaining in the express toll lanes that could be used by SOVs willing to pay a toll; and toll rates.

Figure 5-1 shows the relationship between these levels of analysis, and how the data collected as part of this study was used.

EXISTING AND FUTURE GLOBAL DEMAND

WSA used PSRC's trip tables as a starting point for the development of the toll diversion model used in this study. The trip tables included data for model years 2005, 2014 and 2030. Information regarding the vehicle classes and traffic during different times of day were identified. The vehicle class distribution included SOV, HOV2 (high occupancy vehicles with two occupants), HOV3+ (high occupancy vehicles with three or more occupants), van, light truck, medium truck, and heavy truck. The time periods included morning, midday, evening, and night time.

Chapter 2 of this study presents a summary and discussion of the data collection effort used to develop a travel demand profile for the I-405 corridor. This information was used to calibrate the model to show existing I-405 conditions.

WSA developed an additional set of trip tables for 2010 (the assumed opening year) by using the data between the years 2005 and 2014. In order to create a more detailed future year analysis, an additional set of trip tables was developed for 2020 by using the data between the years 2014 and 2030.

Chapter 3 of this study shows the work conducted by NEI in reviewing the socio-demographic information used to adjust the trip tables from the original data provided by PSRC. The suggested modifications to population, number of households, and employment were provided to Mirai Associates for use in adjusting the trip generation portion of the model incorporating these refinements.

Figure 5-1
Study Methodology Flow Chart

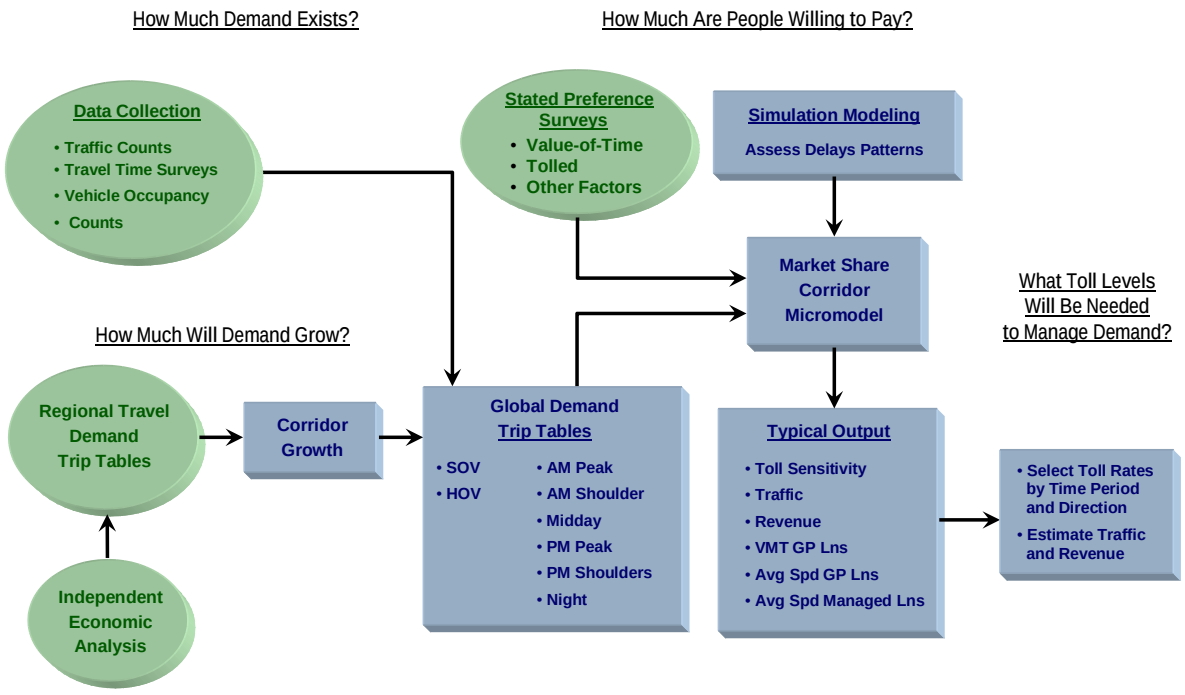


Table 5-1 shows a summary of the overall impact on trip table growth from PSRC's trip table to the trip tables that include NEI's socio-demographic analysis. The average annual growth rate between 2005 and 2010, and between 2010 and 2014, increased by 0.2 percent. Between 2014 and 2020, the average growth rate decreased by 0.1 percent, and there was no change between 2020 and 2030. The cumulative effect of these changes resulted in an increase of 2030 trip table volumes by approximately one percent (a relatively minor impact) from PSRC's trip tables to the trip tables that include NEI's socio-demographic analysis.

Table 5-1
Comparison of Unadjusted and Adjusted
PSRC Trip Table Growth Rates

Average Annual Percent Growth

Period	Unadjusted PSRC Trip Tables	Trip Tables with NEI Adjustments
2005-2010	1.3 %	1.5 %
2010-2014	1.2	1.4
2014-2020	1.3	1.2
2020-2030	1.1	1.1

WILLINGNESS TO PAY TOLLS

The size and complexity of PSRC's regional travel demand model made it challenging to test the interplay between express toll lanes and GP lanes at various toll levels. A micro-model was created from the regional model to conduct the analysis. The micro-model includes the entire I-405 corridor, including the proposed express toll lanes, and primary alternate routes to I-405.

The regional travel demand model provided the base travel patterns and growth characteristics for the micro-model. Once the new micro-model was developed, it was re-calibrated to ensure consistency with the regional model. In addition to the 2005 base year model, micro-models were developed for 2010, 2014, 2020, and 2030.

Time Periods Analyzed - In order to analyze more discrete time periods than are typically provided in regional travel demand models, WSA developed a more detailed set of trip tables, using 15-minute count information, than the original trip tables provided by PSRC.

The analysis periods used in the micro-model include the following:

1. AM 0: 5:00 to 5:30 AM;
2. AM 1: 5:30 to 6:30 AM;
3. AM 2: 6:30 to 8:30 AM;
4. AM 3: 8:30 to 9:30 AM;
5. MD 1: 9:30 AM to 2:30 PM;
6. PM 1: 2:30 to 3:30 PM;
7. PM 2: 3:30 to 5:30 PM;
8. PM 3: 5:30 to 6:30 PM; and
9. PM 4: 6:30 to 7:00 PM.

The travel patterns for each of these detailed periods are consistent with the trip table periods provided in the PSRC model. The only difference is that they have been disaggregated into more discrete time periods to better reflect the various traffic demand profiles in the I-405 corridor.

PSRC's model also provided information on the night time period from 7 p.m. to 5 a.m. Since this study assumes that the express toll lanes would operate toll-free during this period, no toll analysis was conducted for this period. PSRC's model and the micro-model reflect a typical weekday condition.

For ease of reporting, the detailed periods in this chapter have been summarized in some cases. Following are the detailed periods at the summary level:

1. AM Shoulder: 5:00 to 6:30 AM and 8:30 to 9:30 AM (AM 0, AM 1 and AM 3);
2. AM Peak: 6:30 to 8:30 AM (AM 2);
3. Midday: 9:30 AM to 2:30 PM (MD 1);
4. PM Shoulder: 2:30 to 3:30 PM and 6:30 to 7:00 PM (PM 1 and PM 4); and
5. PM Peak: 3:30 to 6:30 PM (PM 2 and PM 3).

Travel Time Simulation Model (VISSIM) - Traditional traffic assignment models do not replicate the impact of merging and weaving maneuvers on freeway capacity very well, nor can they reflect the impact of downstream queuing on freeway segments. WSA used a simulation model called VISSIM to assist in estimating the impacts of the project travel speeds on different segments of the freeway. VISSIM attempts to model each vehicle as a separate entity. The roadway geometry and interaction with other vehicles influence the behavior of each vehicle in the model. A certain level of randomness in vehicle behavior is also present.

A series of VISSIM model runs were made using differing assumptions about traffic shifts to the express toll lanes for each of the detailed periods. As traffic shifts into the express toll lanes, the amount of traffic in the GP lanes would decrease, resulting in lower congestion levels in the GP lanes. A total of eight model runs were made for each

analysis period in each direction. Within each time period, for each roadway segment, a relationship was developed between the "traffic demand" on the segment and its modeled travel speed. By graphing the relationship between traffic demand and travel speed for all model runs on each mainline segment, WSA developed scenario-specific volume-delay curves (often referred to as speed-flow curves) for each mainline link on the GP lanes.

Each link in the micro-model was tagged with a user code to identify a volume-curve which would be used to estimate travel speeds for that link during the micro-model assignment process. Links with less weaving and merging were capable of accommodating higher traffic volumes at higher speeds before breaking down. Certain sections of the freeway, which may have large entering or exiting express toll lane traffic volumes, tend to break down at lower demand levels, and also may break down more quickly. Other sections of freeway may appear to break down at relatively low levels of demand, but may actually be affected by downstream congestion and queuing from these downstream bottlenecks.

Market Share Analysis - In the micro-model, travel time between a path using the tolled express toll lanes was compared to travel time on a path using the next best free routes (most commonly the GP lanes). For each travel movement, the proportion of motorists expected to use the express toll lanes was computed based on time savings and the cost to use the lanes (cost per minute saved) as compared to the value placed on time savings by the motorist (value of time or VOT).

The share of each traffic movement that is captured by the express toll lanes is based on an estimate of the assumed distribution of the VOT, as developed from the stated preference surveys described in Chapter 4 of this study. This study assumed that motorists with a VOT greater than the cost per minute saved would tend to choose the express toll lanes, while those with a lower VOT would tend to choose the free route. Figure 4-13 in Chapter 4 of this study shows today's estimated distribution of these values. This distribution is reflected in VOT per minute in the micro-model. A VOT inflationary rate of 3.0 percent per year was used when developing model years 2010, 2014, 2020 and 2030. This was intended to reflect both inflation and real growth in income levels.

The micro-model relies on an equilibrium condition between the toll cost and the estimated time savings. If more traffic uses the express toll lanes, there is less congestion in the GP lanes, and lower time savings for motorists using the express toll lanes. Less time savings would result in fewer motorists choosing the express toll lanes. For each toll rate level, an equilibrium point exists between the level of traffic congestion in the free lanes (time savings) and the amount of traffic willing to pay a toll to save that same amount of time.

A full range of toll rates were tested (from $0.05 per mile to more than $2.00 per mile) for each time period and travel direction. The toll rates chosen for use in the traffic and revenue analysis generally reflect the lowest toll rate possible, while still maintaining free-flow conditions in the express toll lanes. The result is that no more than 1,500 vehicles per hour per lane were allowed in the single express toll lane sections of the project and 1,600 vehicles per hour per lane in the dual express toll lane sections of the project. Additional secondary capacity concerns were considered for certain express toll lane ingress and egress points along the I-405 corridor. To accommodate higher demands at these locations, toll levels would have to be set so that Express Toll Lane volumes fall below the target traffic volumes specified above. This will be discussed in more detail later in this chapter.

Vehicle Categories **-** The micro-model trip tables were separated into SOV, HOV2, HOV3+, and truck categories. This study assumed that all HOVs were allowed to use the express toll lanes for free. Only SOV motorists would be subjected to the toll diversion logic in the micro-model. Some portion of motorists will not be able or willing to use the express toll lanes. They may be opposed to the use of electronic toll detection; be infrequent users; or out of state residences, etc. To account for this, the toll diversion logic accounts for only 80 percent of the potentially eligible SOV motorists. The remaining 20 percent would use the GP lanes at all times.

Small trucks would be allowed to use the express toll lanes, just as they are allowed to use the HOV lanes now. As a result, WSA separated a portion of the micro-model trip tables to represent light, medium, and heavy trucks. The medium and heavy truck trip table was assigned to the arterial streets and GP lanes only, and used as a preload volume for the main equilibrium assignments. Single occupant small trucks would be allowed to buy into the express toll lanes if they chose to.

BASIC ASSUMPTIONS

Traffic and toll revenue estimates for the express toll lanes were based on the following assumptions:

1. The express toll lanes and other I-405 improvements will be implemented as described in Chapter 1 of this study. No additional toll-free capacity will be added to I-405 during the forecast period.

2. Maximum toll revenue generation is not the primary goal of the express toll lanes. Express toll lane toll rates will be set at the lowest levels that still maintain free-flow conditions in the express toll lanes. For purposes of this analysis, this has been defined as 1,500 vehicles per lane per hour in the single-express toll lane section and 1,600 vehicles per hour per lane in the dual-express toll lane section.

3. Rigorous express toll lanes enforcement will be implemented to minimize toll violations.

4. The "Good To Go!" electronic toll program will be effectively marketed and widely available to all motorists interested in using the express toll lanes.

5. For purposes of this analysis, the definition of HOV is any vehicle with two or more passengers. All HOV passenger cars, buses, van pools and light trucks will be eligible to use the express toll lanes for free. Motorcycles will also be able to use the express toll lanes for free.

6. Medium and heavy trucks will be prohibited from using the express toll lanes.

7. For purposes of this study, express toll lane hours of operation were assumed to be from 5 a.m. until 7 p.m. Outside of those hours the lanes will be open and free to all vehicles. These restrictions apply to all days of the week.

8. Improvements to the highway and local road system in the travel corridor will be limited to those included in the PSRC global demand model. WSDOT provided Appendix C, that lists the transportation improvement projects that were assumed to be completed in the 2014 and 2030 PSRC models.

9. No significant improvements in light rail or bus rapid transit would be implemented that would compete for I-405 patrons.

10. The travel demand on the major highways will remain as anticipated; no large scale alternate routes avoiding the I-405 corridor area will be constructed during the forecast period.

11. No major recession or significant economic restructuring will occur which would substantially reduce traffic in the region.

12. Regional and corridor growth will be generally as forecasted in the PSRC model, and as outlined by NEI in their comprehensive economic report.

13. No natural disasters will occur that could significantly alter travel patterns throughout the area.

14. Inflation will average 2.5 percent per year over the projection period. In addition, there will be at least a 0.5 percent per year increase in "real" income.

15. Over the long term, motor fuel will remain in adequate supply, and future increases in fuel price will not significantly exceed the overall rate of inflation.

16. No local, regional, or national emergency will arise that would abnormally restrict the use of motor vehicles.

Any significant departure from these basic assumptions could materially affect estimated traffic and toll revenue for the I-405 toll road.

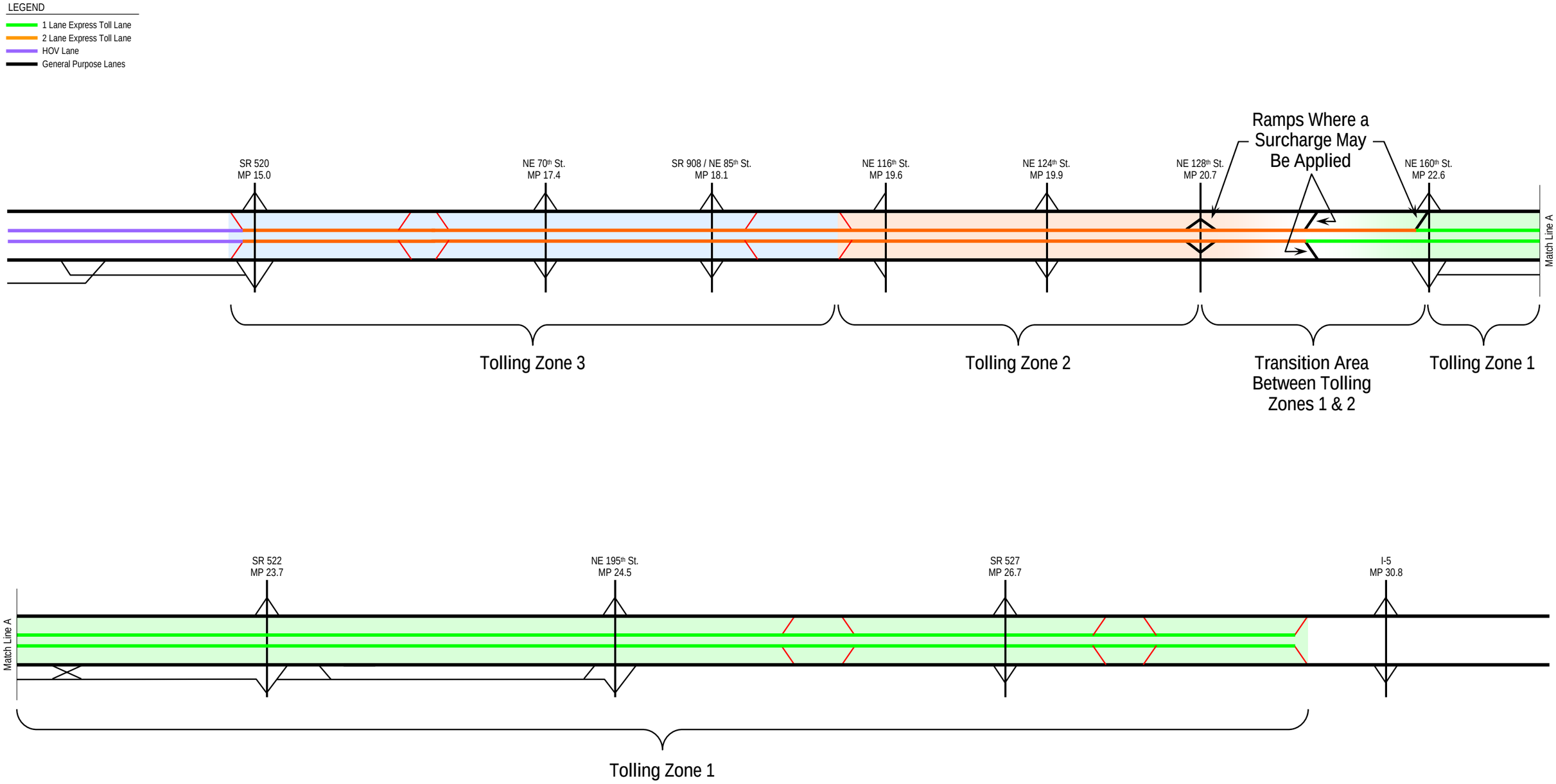
ESTIMATED TRAFFIC AND TOLL REVENUE

This section describes the process used to determine the average toll rates required to maintain free-flow conditions in the express toll lanes. Average weekday traffic in the express toll lanes resulting from the selected toll rates is presented, and volumes for each express toll lane segment, by time period, vehicle type (HOV versus SOV) and model year are also presented. The gross toll revenue is shown by time period for each model year. Annual revenue values between 2010 and 2030 are shown based on data taken from the traffic and revenue estimates between each model year. The final table in this chapter will compare the Base Case revenue estimates with the revenue estimates developed from the three sensitivity tests.

TOLL RATE FRAMEWORK

The estimated average toll rates for each of the nine modeled time periods were developed by a multi-step process. The major steps included:

- Developing three tolling zones for trips made on the express toll lanes (these zones are shown in Figure 5-2),
- Running toll sensitivity tests by time period based on per-mile toll rates in each tolling zone,
- Selecting the appropriate toll rate from the sensitivity tests for each tolling zone and time period that achieves the target traffic flow on the mainline sections of the express toll lanes,
- Analyzing the traffic demand on the ingress and egress ramps of the express toll lanes for each time period to determine whether the demand would cause undue weaving and merging between the GP lanes and the express toll lanes.
- Running additional toll sensitivity tests only on the ingress and egress ramps for time periods when express lane traffic demand creates undue weaving and merge conditions. The ramps that experienced excess traffic demand are shown in Figure 5-2, and labeled *Ramps Where A Surcharge May Be Applied*. An additional toll or surcharge would accrue for use of these ramps in addition to the per-mile rate.
- Running assignments with the composite effects of the per-mile toll rates and the surcharges at select ingress and egress ramps and time periods to finalize the toll rates for each movement on the express toll lanes by time period.



WilburSmith ASSOCIATES

DEVELOPMENT OF TOLLS, TOLLING ZONES AND SURCHARGE LOCATIONS

FIGURE 5-2

The rest of this section describes the process of toll rate setting in more detail. It should be noted that the process of developing the tolls is relatively complicated, but the motorist will only see a final toll rate for his or her specific trip.

Initially in the toll setting process, three distinct tolling zones were established such that any vehicle traveling through or within a zone would be assessed the assumed toll rate for that zone. If a vehicle passed through two zones, it would be assessed the cumulative amount of the tolls for both zones. If a vehicle passed through all three zones, it would be assessed the cumulative amount of the tolls for all three zones.

Increasingly greater rates were tested for each tolling zone, ranging from per mile rates of $0.05 up to more than $2.00 per mile. This toll sensitivity analysis was conducted for each of the nine time periods of the weekday, in each direction, and for each of the four future model years. Once the toll sensitivity tests for a time period and year were complete, an analysis was conducted to determine the lowest toll rate that could be applied and still maintain free-flow conditions in the express toll lanes. The overriding goal was to maximize traffic flow, not revenue from the tolls.

As discussed above, the goal was to maintain express toll lane traffic flow at, or below, 1,500 vehicles per lane per hour in the one lane section north of SR 522 and at, or below, 1,600 vehicles per lane per hour on the two-lane express toll lane section between SR 522 and SR 520. Multiple combinations of rates could be used to achieve this goal, but sufficient capacity for long distance through trips to buy into the express toll lanes should be made available.

Once rates were established that optimized conditions on the express toll lane mainline segments, an operational analysis was conducted to determine how the express toll lane ingress and egress points operated. WSA provided trip table information to WSDOT for input into the VISSIM operational model. Based on that analysis, it was determined that the resulting traffic volumes accessing the express toll lanes via SR 522 and NE 160th Street caused weave and merge problems. WSDOT also determined that the resulting traffic volumes accessing the express toll lanes from NE 128th Street were too high to be accommodated on the local arterials, including 128th Street. These conditions were especially acute during morning and evening peak periods.

In order to reduce demand for these key bottleneck areas, additional “surcharges” were applied to the rates at these locations during certain peak periods. This resulted in decreased demand for the express toll lanes and improved operation at the access points. It also resulted in less efficient use of the express toll lanes. Under ideal conditions, rates would decrease in other locations to allow more through trips to use this available capacity. But the one-lane express toll lane section north of SR 522 was typically already at capacity during such peak periods and could not accommodate additional traffic.

It was assumed for this study that a minimum toll rate would be set for any trip on the I-405 express toll lanes. The minimum toll was intended to cover the cost of toll collection. Minimum tolls, in current dollars, of $0.50, $0.60, $0.75 and $1.00 were assumed for 2010, 2014, 2020 and 2030, respectively. These increases are meant to account for inflation over time. Toll rates were never allowed to drop below these levels in this analysis.

Matrices of average toll rates for all possible express toll lane movements, by direction, time period, and year, are provided in Appendix B in both current dollars and constant 2007 dollars. Table 5-2 shows estimated average toll rates in constant 2007 dollars by time period for four movements on the express toll lanes. The estimated average tolls for years 2010, 2014, 2020, and 2030 are shown at their dollar value in 2007. A constant dollar removes the inflation impact on prices over time; for this study, it was assumed that inflation averaged 2.5 percent per year from 2007 through 2030.

Estimated average toll rates are highest in the southbound direction during the morning peak (6:30 – 8:30 a.m.). The estimated average toll rates in the northbound direction occur in a more spread out peak from 3:30 to 6:30 p.m. The toll rates in Table 5-2 are average rates within each time period. Actual toll rates will fluctuate within the time period based on traffic demand. The intention is that traffic conditions on I-405 will be monitored in real time and toll rates adjusted on a nearly continuous basis. The rates developed in this study were for modeling purposes, and are meant to reflect the average rates expected during each time period

Figures 5-3 and 5-4 show, in graphical format, the toll rate estimates in Table 5-2 for a through trip on the I-405 express toll lanes in the southbound and northbound directions, respectively. Estimated average toll rates are highest in the southbound direction during the morning peak (6:30 – 8:30 a.m.). The estimated average toll rates in the northbound direction occur in a more spread out peak from 3:30 to 6:30 p.m.

In the southbound direction, in Figure 5-3, one sees that the average toll from 6:30 to 8:30 a.m. actually decreases in constant 2007 dollars from $11.19 in 2010, to $10.41 in 2020, and $10.85 in 2030. In current dollars the estimated average tolls are increasing from $12.05 in 2010, to $14.35 in 2020, and $19.15 in 2030 (these are shown in Appendix B). The following helps to understand why tolls in constant 2007 dollars would be decreasing over time. Even in 2010 during the AM Peak (6:30 – 8:30 a.m.), the GP

Table 5-2
Examples of Estimated Average Weekday Toll Rates By Movement on the Express Toll Lanes
In Constant 2007 Dollars (1)
I-405 Express Toll Lanes

Through Trip (Between SR 520 and I-5 North)

	2010		2014		2020		2030	
Time Period	SB (2)	NB (3)	SB (2)	NB (3)	SB (2)	NB (3)	SB (2)	NB (3)
5:00 - 5:30 a.m.	$0.70	$0.70	$0.63	$0.63	$0.54	$0.54	$0.57	$0.57
5:30 - 6:30 a.m.	0.70	0.70	0.63	0.63	1.09	0.54	2.69	0.57
6:30 - 8:30 a.m.	11.19	0.70	10.43	0.63	10.41	0.54	10.85	0.57
8:30 - 9:30 a.m.	2.60	0.70	3.70	0.63	5.98	0.54	6.23	0.57
9:30 a.m. - 2:30 p.m.	0.70	0.70	0.63	0.63	0.54	0.54	0.57	0.57
2:30 - 3:30 p.m.	0.70	2.14	0.63	2.82	0.54	3.01	0.57	4.76
3:30 - 5:30 p.m.	0.70	5.71	0.63	8.96	0.54	12.11	1.19	14.14
5:30 - 6:30 p.m.	1.02	5.99	1.89	6.86	3.81	10.77	7.91	14.28
6:30 - 7:00 p.m.	0.70	1.90	0.63	2.69	0.54	5.26	1.90	8.36

Between SR 520 and SR 522

	2010		2014		2020		2030	
Time Period	SB (2)	NB (3)	SB (2)	NB (3)	SB (2)	NB (3)	SB (2)	NB (3)
5:00 - 5:30 a.m.	$0.46	$0.46	$0.50	$0.50	$0.54	$0.54	$0.57	$0.57
5:30 - 6:30 a.m.	0.46	0.46	0.50	0.50	0.54	0.54	1.36	0.57
6:30 - 8:30 a.m.	4.78	0.46	4.75	0.50	4.43	0.54	4.76	0.57
8:30 - 9:30 a.m.	1.76	0.46	2.44	0.50	2.72	0.54	3.83	0.57
9:30 a.m. - 2:30 p.m.	0.46	0.46	0.50	0.50	0.54	0.54	0.57	0.57
2:30 - 3:30 p.m.	0.46	1.53	0.50	2.36	0.54	3.19	0.57	4.25
3:30 - 5:30 p.m.	0.46	3.58	0.50	5.80	0.54	6.89	0.57	8.13
5:30 - 6:30 p.m.	0.46	4.18	0.50	4.67	0.54	6.24	1.67	7.59
6:30 - 7:00 p.m.	0.46	1.86	0.50	1.77	0.54	2.97	0.57	4.96

Between SR 522 and I-5 north

	2010		2014		2020		2030	
Time Period	SB (2)	NB (3)	SB (2)	NB (3)	SB (2)	NB (3)	SB (2)	NB (3)
5:00 - 5:30 a.m.	$0.46	$0.46	$0.50	$0.50	$0.54	$0.54	$0.57	$0.57
5:30 - 6:30 a.m.	0.46	0.46	0.50	0.50	0.83	0.54	2.35	0.57
6:30 - 8:30 a.m.	8.73	0.46	8.20	0.50	8.16	0.54	8.50	0.57
8:30 - 9:30 a.m.	1.76	0.46	2.52	0.50	4.35	0.54	4.25	0.57
9:30 a.m. - 2:30 p.m.	0.46	0.46	0.50	0.50	0.54	0.54	0.57	0.57
2:30 - 3:30 p.m.	0.46	0.84	0.50	1.09	0.54	1.27	0.57	3.49
3:30 - 5:30 p.m.	0.46	4.92	0.50	6.31	0.54	9.58	0.65	9.97
5:30 - 6:30 p.m.	0.70	5.71	1.60	5.55	3.55	9.25	6.38	11.22
6:30 - 7:00 p.m.	0.46	1.63	0.50	2.23	0.54	4.46	1.70	6.23

Between SR 520 and NE 124th Street

	2010		2014		2020		2030	
Time Period	SB (2)	NB (3)	SB (2)	NB (3)	SB (2)	NB (3)	SB (2)	NB (3)
5:00 - 5:30 a.m.	$0.46	$0.46	$0.50	$0.50	$0.54	$0.54	$0.57	$0.57
5:30 - 6:30 a.m.	0.46	0.46	0.50	0.50	0.54	0.54	0.57	0.57
6:30 - 8:30 a.m.	0.46	0.46	0.50	0.50	0.54	0.54	0.57	0.57
8:30 - 9:30 a.m.	0.46	0.46	0.50	0.50	0.54	0.54	0.57	0.57
9:30 a.m. - 2:30 p.m.	0.46	0.46	0.50	0.50	0.54	0.54	0.57	0.57
2:30 - 3:30 p.m.	0.46	0.74	0.50	0.97	0.54	0.98	0.57	0.88
3:30 - 5:30 p.m.	0.46	0.46	0.50	1.30	0.54	1.12	0.57	2.21
5:30 - 6:30 p.m.	0.46	0.46	0.50	0.50	0.54	0.54	0.85	1.11
6:30 - 7:00 p.m.	0.46	0.46	0.50	0.50	0.54	0.54	0.57	0.88

(1) Assumes a 2.5 percent annual inflation rate.
(2) SB = Southbound
(3) NB = Northbound

Figure 5-3
Estimated Average Weekday Toll Rates By Year and Time Period
Southbound Through Trip Between I-5 and SR 520

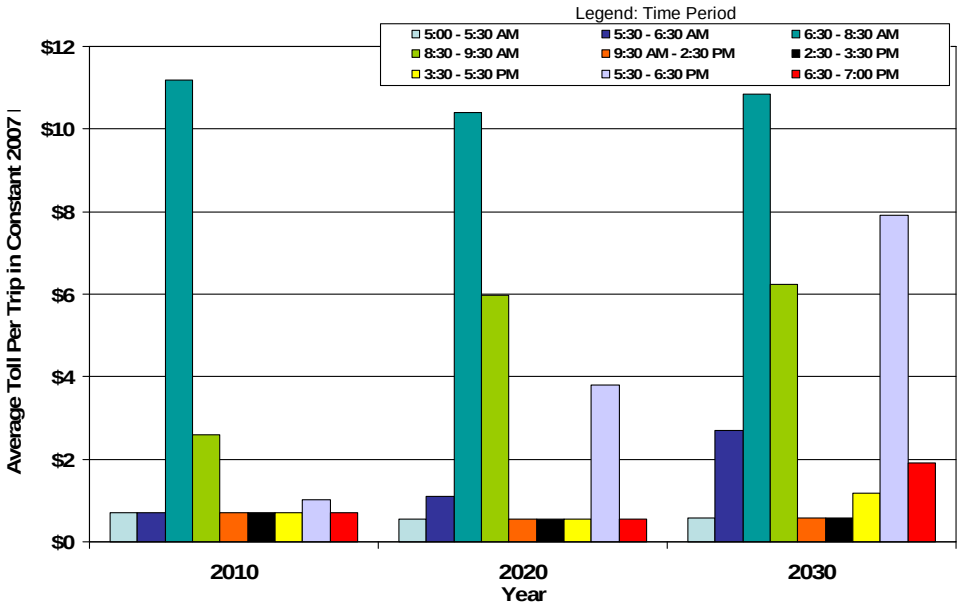
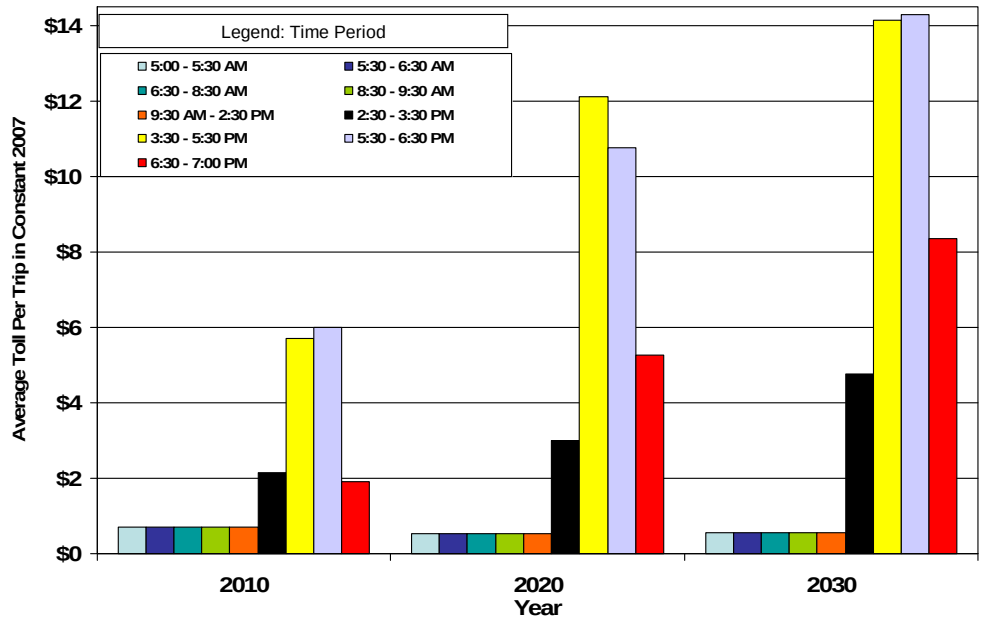


Figure 5-4
Estimated Average Weekday Toll Rates By Year and Time Period
Northbound Through Trip Between SR 520 and I-5



lanes are at capacity in many sections, so the demand for the express toll lanes is large. Much of the express toll lane capacity is already filled with HOVs, so there is very little express toll lane capacity left for SOVs. There is also a population of motorists in the I-405 Study Area that have a high value of time and are willing to by into the express toll lanes at very high tolls. The result is that a certain population of motorists are very insensitive to tolls during congested time periods. During these periods, tolls can be raised with very little impact or reduction on the express toll lanes traffic volumes. In the modeling process of this study, toll rates were run in current dollars, which were increased through the years to the point where the traffic became insensitive to toll rate increases. This approach resulted in the marginally decreasing average toll rates seen in Figure 5-3 from 6:30 to 8:30 a.m. This condition points out two policy questions for express toll lane operations:

1. Will a maximum cap be applied to toll rates?, and

2. If there is very little capacity during peak periods in the express toll lanes, should the express toll lanes be temporarily closed to SOVs?

It should be pointed out that a motorist's value of time is not constant, nor entirely related to income. For example, a parent with a very modest annual income would still have a high value of time if he/she is running late to pick up a child at daycare. In this case, his/her value of time is high and would translate into a willingness to pay for the faster trip in the express toll lanes. A high value of time and a willingness to pay for use of the express toll lanes is not limited to high income people.

Also apparent in Figure 5-3, are the relatively cheap toll rates that would be available to southbound motorists who use the express toll lanes outside of the most congested times of the day. As the years progress, congestion in the GP lanes spreads into the adjoining time period from 8:30 to 9:30 a.m., causing a substantial increase in the average toll on the express toll lanes by 2020. Traffic demand on I-405 is also estimated to increase to the point in 2020 and 2030 that substantially higher toll rates will be needed during 5:30 to 6:30 p.m. in the southbound direction to maintain free flow conditions in the express toll lanes.

Figure 5-4 shows the estimated average tolls in constant 2007 dollars for a northbound through trip on the express toll lanes. The peak traffic demand for the express toll lanes is spread out over three hours (3:30 – 6:30 p.m.) in 2010 and over three and one-half hours (3:30 – 7:00 p.m.) in 2020 and 2030. This is indicated by the increasing average tolls needed to maintain free flow conditions in the express toll lanes. In constant 2007 dollars, the average estimated toll increases from $5.71 in 2010, to $12.11 in 2020, and to $14.14 in 2030 during the time period 3:30 to 5:30 p.m. In current dollars the average toll rates equate to $6.15, $16.70, and $24.95, in 2010, 2020 and 2030 respectively as shown in Appendix B.

It should be pointed out that by 2030 the northbound 6:30-7:00 p.m. period requires a $8.36 average toll in constant 2007 dollars. This indicates that relatively high traffic demand exists for the express toll lanes during this period; demand that would likely continue past 7:00 p.m. This study assumes the express toll lanes revert to toll-free operation after 7:00 p.m.; these toll rates suggest that express toll lane operations may need to be extended past 7:00 p.m. to manage evening traffic demand.

ESTIMATED EXPRESS TOLL LANES TRAFFIC

Figures 5-5 through 5-8 show the express toll lane traffic resulting from the combined use of the market share model, the toll rate assumptions, and traffic demand discussed above for each model year. Detailed volume information (shown in thousands, e.g., 7.7 denotes 7,700 weekday trips during the period shown) for the express toll lanes is provided for each mainline segment by time period, direction, and vehicle type (toll paying SOVs and toll-free HOVs). All express toll lane access volumes are shown for the "total day." In this case, "total day" reflects only the time during which the express toll lanes are assumed to be in effect, i.e., between 5 a.m. and 7 p.m.

The volumes shown in the short blue section south of SR 520 reflect HOV traffic only. In the 2010 volumes shown in Figure 5-5, the northbound HOV only volume is estimated to be 12,900 vehicles. The express toll lanes begin at the ingress and egress locations immediately south of SR 520. At these locations, 10,000 vehicles enter the northbound express toll lanes, and 9,200 exit the southbound express toll lanes. No SOVs will be permitted south of this point, into the blue section of the figure.

Total weekday volumes for the express toll lanes in 2010 range between 18,900 and 28,700 along the two-lane Express Toll Lanes section. North of SR 522, total daily volumes drop by approximately half, which corresponds to the reduction in express toll lanes from two lanes to one lane in each direction. Toll paying SOVs account for between 30 and 40 percent of the trips in the two-lane HOV section, while they account for between about 20 and 30 percent in the one-lane section. The decrease in toll paying SOVs in the one-lane section is due to the limited capacity in the one-lane section, much of which is used by toll-free HOV traffic.

Total weekday growth rates in express toll lane traffic increase by approximately 1.0 and 2.0 percent annually between 2010 and 2030, depending on the location of the mainline and the direction of travel. However, within peak periods, there is almost no growth between these two years. This occurs because there is enough demand during peak periods to fill up available capacity beginning in 2010. For example, the southbound mainline between NE 70th Street and SR 520 exhibits one of the higher total per annum growth rates between 2010 and 2030 at 1.8 percent (from 18,900 in Figure 5-5 to 26,900 in Figure 5-8). The morning peak period, however, shows a constant volume of 4,700 in both years, exhibiting no growth at all. Midday traffic volumes double over that same time period from 4,100 to 8,200.

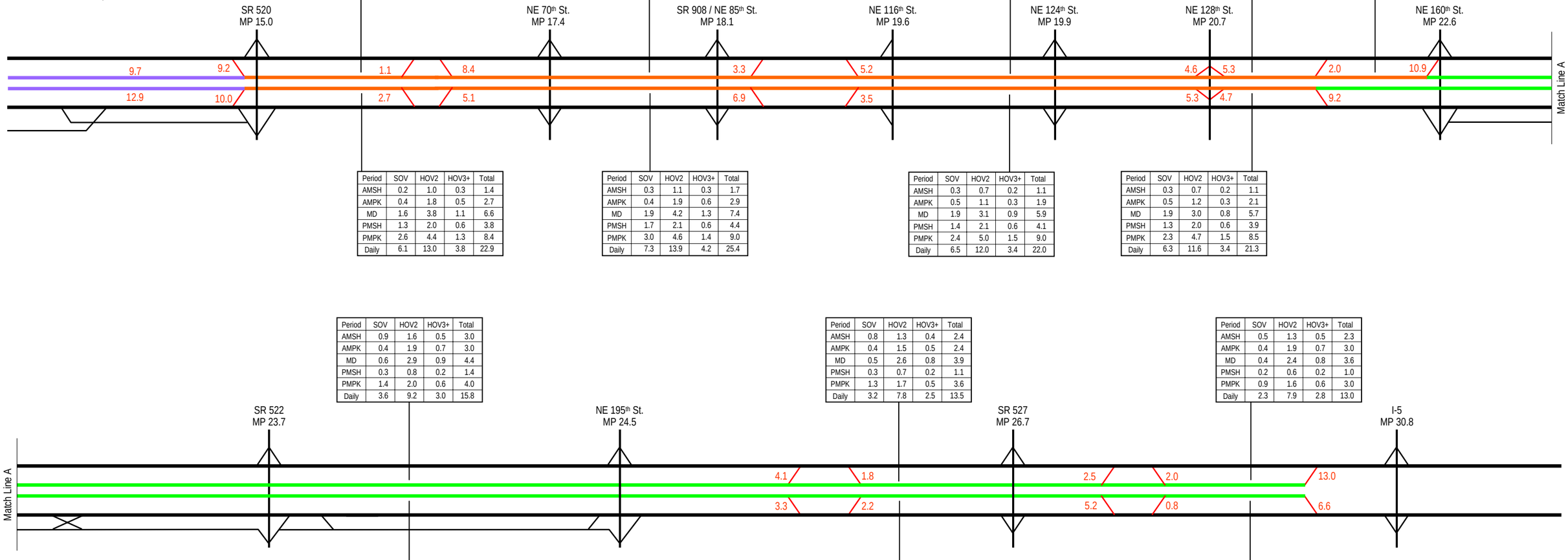
LEGEND

- 1 Lane Express Toll Lane
- 2 Lane Express Toll Lane
- HOV Lane
- General Purpose Lanes
- 0.0 Express Lane Ramp Total Weekday Volumes (does not include night)

AMSH (AM Shoulder) 5:00-6:30 AM, 8:30-9:30 AM
AMPK (AM Peak) 6:30-8:30 AM
MD (Midday) 9:30 AM-2:30 PM
PMSH (PM Shoulder) 2:30-3:30 PM, 6:30-7:00 PM
PMPK (PM Peak) 3:30-6:30 PM
WeekdayTotal 5:00 AM-7:00 PM Weekday Volume

Note: All volumes shown represent thousands of vehicles.

Not to Scale



Period	SOV	HOV2	HOV3+	Total
AMSH	1.5	1.5	0.5	3.5
AMPK	1.5	2.4	0.8	4.7
MD	1.6	2.0	0.6	4.1
PMSH	0.7	0.7	0.2	1.6
PMPK	2.5	2.0	0.6	5.0
Daily	7.7	8.6	2.6	18.9

Period	SOV	HOV2	HOV3+	Total
AMSH	0.2	1.0	0.3	1.4
AMPK	0.4	1.8	0.5	2.7
MD	1.6	3.8	1.1	6.6
PMSH	1.3	2.0	0.6	3.8
PMPK	2.6	4.4	1.3	8.4
Daily	6.1	13.0	3.8	22.9

Period	SOV	HOV2	HOV3+	Total
AMSH	2.2	2.0	0.6	4.9
AMPK	2.0	3.1	1.1	6.1
MD	2.1	2.8	1.0	5.9
PMSH	1.0	1.0	0.3	2.3
PMPK	3.4	2.7	0.8	6.9
Daily	10.7	11.7	3.7	26.1

Period	SOV	HOV2	HOV3+	Total
AMSH	0.3	1.1	0.3	1.7
AMPK	0.4	1.9	0.6	2.9
MD	1.9	4.2	1.3	7.4
PMSH	1.7	2.1	0.6	4.4
PMPK	3.0	4.6	1.4	9.0
Daily	7.3	13.9	4.2	25.4

Period	SOV	HOV2	HOV3+	Total
AMSH	2.4	2.4	0.8	5.7
AMPK	1.5	3.7	1.3	6.5
MD	2.1	3.4	1.1	6.6
PMSH	0.9	1.1	0.3	2.4
PMPK	2.9	3.0	0.9	6.9
Daily	9.8	13.8	4.4	28.0

Period	SOV	HOV2	HOV3+	Total
AMSH	0.3	0.7	0.2	1.1
AMPK	0.5	1.1	0.3	1.9
MD	1.9	3.1	0.9	5.9
PMSH	1.4	2.1	0.6	4.1
PMPK	2.4	5.0	1.5	9.0
Daily	6.5	12.0	3.4	22.0

Period	SOV	HOV2	HOV3+	Total
AMSH	2.4	2.5	0.8	5.8
AMPK	1.5	3.6	1.3	6.4
MD	2.0	3.8	1.3	7.1
PMSH	0.9	1.2	0.4	2.5
PMPK	2.9	3.1	0.9	6.9
Daily	9.7	14.3	4.7	28.7

Period	SOV	HOV2	HOV3+	Total
AMSH	0.3	0.7	0.2	1.1
AMPK	0.4	1.2	0.3	2.1
MD	1.9	3.0	0.8	5.7
PMSH	1.3	2.0	0.6	3.9
PMPK	2.3	4.7	1.5	8.5
Daily	6.3	11.6	3.4	21.3

Period	SOV	HOV2	HOV3+	Total
AMSH	2.3	2.4	0.8	5.4
AMPK	1.4	3.4	1.2	5.9
MD	1.9	3.6	1.2	6.7
PMSH	0.9	1.1	0.3	2.3
PMPK	2.7	2.8	0.9	6.3
Daily	9.1	13.3	4.3	26.7

Period	SOV	HOV2	HOV3+	Total
AMSH	0.9	1.6	0.5	3.0
AMPK	0.4	1.9	0.7	3.0
MD	0.6	2.9	0.9	4.4
PMSH	0.3	0.8	0.2	1.4
PMPK	1.4	2.0	0.6	4.0
Daily	3.6	9.2	3.0	15.8

Period	SOV	HOV2	HOV3+	Total
AMSH	0.2	0.5	0.1	0.8
AMPK	0.5	0.8	0.2	1.5
MD	1.2	1.7	0.4	3.4
PMSH	0.6	1.1	0.3	2.1
PMPK	0.9	2.7	0.8	4.4
Daily	3.4	6.8	1.9	12.1

Period	SOV	HOV2	HOV3+	Total
AMSH	0.8	1.3	0.4	2.4
AMPK	0.4	1.5	0.5	2.4
MD	0.5	2.6	0.8	3.9
PMSH	0.3	0.7	0.2	1.1
PMPK	1.3	1.7	0.5	3.6
Daily	3.2	7.8	2.5	13.5

Period	SOV	HOV2	HOV3+	Total
AMSH	0.2	0.5	0.1	0.8
AMPK	0.6	1.0	0.3	1.8
MD	1.2	1.4	0.3	2.8
PMSH	0.6	1.0	0.3	1.8
PMPK	0.9	2.2	0.7	3.7
Daily	3.4	5.9	1.7	11.0

Period	SOV	HOV2	HOV3+	Total
AMSH	0.5	1.3	0.5	2.3
AMPK	0.4	1.9	0.7	3.0
MD	0.4	2.4	0.8	3.6
PMSH	0.2	0.6	0.2	1.0
PMPK	0.9	1.6	0.6	3.0
Daily	2.3	7.9	2.8	13.0

Period	SOV	HOV2	HOV3+	Total
AMSH	0.1	0.3	0.1	0.6
AMPK	0.4	0.5	0.1	1.1
MD	0.8	0.5	0.1	1.4
PMSH	0.4	0.4	0.2	1.0
PMPK	0.6	1.2	0.7	2.5
Daily	2.3	3.0	1.3	6.6

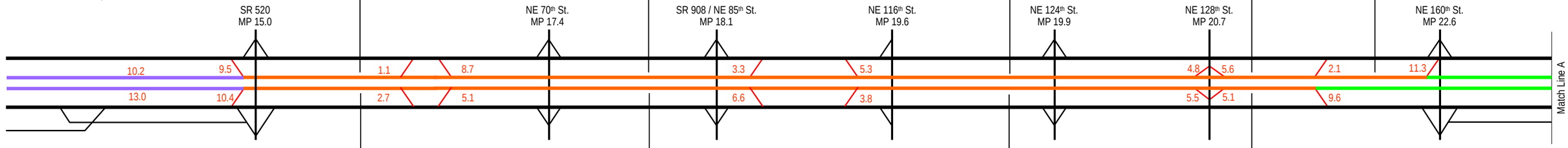
LEGEND

- 1 Lane Express Toll Lane
- 2 Lane Express Toll Lane
- HOV Lane
- General Purpose Lanes
- 0.0 Express Lane Ramp Total Weekday Volumes (does not include night)

AMSH (AM Shoulder) 5:00-6:30 AM, 8:30-9:30 AM
AMPK (AM Peak) 6:30-8:30 AM
MD (Midday) 9:30 AM-2:30 PM
PMSH (PM Shoulder) 2:30-3:30 PM, 6:30-7:00 PM
PMPK (PM Peak) 3:30-6:30 PM
WeekdayTotal 5:00 AM-7:00 PM Weekday Volume

Note: All volumes shown represent thousands of vehicles.

Not to Scale



Period	SOV	HOV2	HOV3+	Total
AMSH	1.4	1.5	0.5	3.4
AMPK	1.5	2.4	0.8	4.6
MD	1.9	2.1	0.6	4.6
PMSH	0.9	0.8	0.2	1.8
PMPK	2.8	1.9	0.5	5.2
Daily	8.4	8.7	2.6	19.7

Period	SOV	HOV2	HOV3+	Total
AMSH	2.1	2.1	0.7	4.9
AMPK	2.0	3.0	1.0	6.0
MD	2.6	2.9	1.0	6.5
PMSH	1.2	1.0	0.3	2.6
PMPK	3.9	2.6	0.8	7.3
Daily	11.8	11.7	3.7	27.2

Period	SOV	HOV2	HOV3+	Total
AMSH	2.2	2.6	0.8	5.6
AMPK	1.6	3.6	1.2	6.4
MD	2.5	3.7	1.2	7.3
PMSH	1.2	1.2	0.3	2.7
PMPK	3.4	3.0	0.9	7.3
Daily	10.8	14.0	4.5	29.2

Period	SOV	HOV2	HOV3+	Total
AMSH	2.2	2.6	0.9	5.7
AMPK	1.6	3.6	1.2	6.4
MD	2.4	4.1	1.3	7.8
PMSH	1.1	1.3	0.4	2.8
PMPK	3.3	3.1	1.0	7.4
Daily	10.6	14.7	4.8	30.1

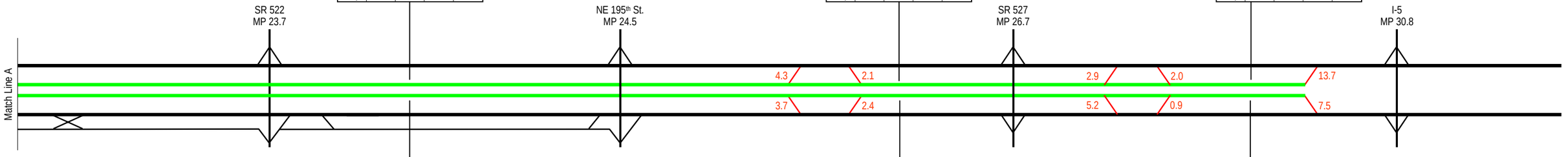
Period	SOV	HOV2	HOV3+	Total
AMSH	2.1	2.5	0.8	5.4
AMPK	1.5	3.3	1.2	5.9
MD	2.3	3.9	1.3	7.4
PMSH	1.1	1.2	0.3	2.6
PMPK	3.1	2.8	0.9	6.8
Daily	10.1	13.6	4.4	28.0

Period	SOV	HOV2	HOV3+	Total
AMSH	0.3	1.1	0.3	1.7
AMPK	0.6	1.8	0.5	2.9
MD	2.3	3.8	1.1	7.2
PMSH	1.3	1.9	0.6	3.8
PMPK	2.1	4.4	1.4	7.9
Daily	6.5	13.0	3.9	23.4

Period	SOV	HOV2	HOV3+	Total
AMSH	0.3	1.2	0.4	1.8
AMPK	0.7	1.8	0.6	3.0
MD	2.7	4.2	1.3	8.1
PMSH	1.7	2.1	0.6	4.4
PMPK	2.4	4.7	1.4	8.4
Daily	7.6	14.0	4.2	25.8

Period	SOV	HOV2	HOV3+	Total
AMSH	0.3	0.7	0.2	1.1
AMPK	0.7	1.0	0.3	2.1
MD	2.7	3.1	0.9	6.8
PMSH	1.4	2.2	0.6	4.3
PMPK	1.9	5.3	1.6	8.8
Daily	7.1	12.3	3.5	23.0

Period	SOV	HOV2	HOV3+	Total
AMSH	0.3	0.7	0.2	1.2
AMPK	0.8	1.1	0.3	2.2
MD	2.7	3.0	0.9	6.6
PMSH	1.3	2.1	0.6	4.0
PMPK	1.8	5.1	1.6	8.5
Daily	7.0	12.1	3.5	22.6



Period	SOV	HOV2	HOV3+	Total
AMSH	0.9	1.7	0.5	3.1
AMPK	0.5	1.9	0.7	3.0
MD	0.8	3.0	1.0	4.8
PMSH	0.5	0.8	0.2	1.6
PMPK	1.6	2.0	0.6	4.2
Daily	4.2	9.4	3.0	16.7

Period	SOV	HOV2	HOV3+	Total
AMSH	0.7	1.4	0.5	2.6
AMPK	0.4	1.5	0.5	2.5
MD	0.7	2.8	0.9	4.4
PMSH	0.4	0.7	0.2	1.3
PMPK	1.5	1.7	0.6	3.8
Daily	3.8	8.2	2.6	14.5

Period	SOV	HOV2	HOV3+	Total
AMSH	0.5	1.4	0.5	2.4
AMPK	0.5	1.9	0.7	3.1
MD	0.5	2.6	0.9	4.0
PMSH	0.3	0.6	0.2	1.1
PMPK	1.0	1.6	0.6	3.1
Daily	2.7	8.1	2.9	13.7

Period	SOV	HOV2	HOV3+	Total
AMSH	0.2	0.5	0.1	0.8
AMPK	0.7	0.8	0.2	1.7
MD	1.8	1.7	0.5	4.0
PMSH	0.7	1.1	0.3	2.1
PMPK	0.7	2.8	0.8	4.4
Daily	4.2	6.9	1.9	13.0

Period	SOV	HOV2	HOV3+	Total
AMSH	0.2	0.5	0.1	0.9
AMPK	0.9	1.0	0.3	2.1
MD	1.7	1.2	0.3	3.2
PMSH	0.6	1.0	0.3	1.8
PMPK	0.7	2.2	0.7	3.7
Daily	4.1	5.9	1.7	11.7

Period	SOV	HOV2	HOV3+	Total
AMSH	0.2	0.4	0.1	0.6
AMPK	0.6	0.6	0.1	1.3
MD	1.1	0.6	0.1	1.8
PMSH	0.4	0.5	0.2	1.1
PMPK	0.5	1.3	0.8	2.7
Daily	2.7	3.3	1.5	7.5

WilburSmith ASSOCIATES

2014 ESTIMATED AVERAGE WEEKDAY EXPRESS TOLL LANES TRAFFIC VOLUMES

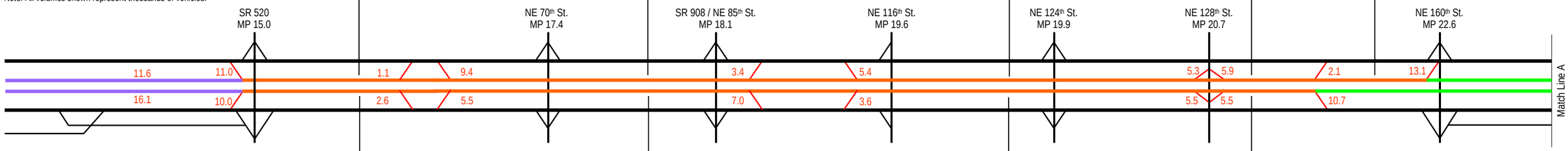
FIGURE 5-6

LEGEND

- 1 Lane Express Toll Lane
- 2 Lane Express Toll Lane
- HOV Lane
- General Purpose Lanes
- 0.0 Express Lane Ramp Total Weekday Volumes (does not include night)

AMSH (AM Shoulder) 5:00-6:30 AM, 8:30-9:30 AM
AMPK (AM Peak) 6:30-8:30 AM
MD (Midday) 9:30 AM-2:30 PM
PMSH (PM Shoulder) 2:30-3:30 PM, 6:30-7:00 PM
PMPK (PM Peak) 3:30-6:30 PM
WeekdayTotal 5:00 AM-7:00 PM Weekday Volume

Note: All volumes shown represent thousands of vehicles.



Period	SOV	HOV2	HOV3+	Total
AMSH	1.7	1.6	0.5	3.8
AMPK	1.4	2.4	0.8	4.6
MD	3.1	2.4	0.7	6.2
PMSH	1.3	0.9	0.2	2.3
PMPK	3.1	2.0	0.5	5.6
Daily	10.6	9.3	2.7	22.6

Period	SOV	HOV2	HOV3+	Total
AMSH	2.4	2.2	0.7	5.3
AMPK	2.0	3.0	1.0	6.0
MD	4.1	3.2	1.1	8.4
PMSH	1.8	1.1	0.3	3.2
PMPK	4.5	2.8	0.8	8.0
Daily	14.7	12.3	3.8	30.9

Period	SOV	HOV2	HOV3+	Total
AMSH	2.5	2.7	0.9	6.1
AMPK	1.6	3.6	1.2	6.4
MD	3.9	4.0	1.3	9.3
PMSH	1.6	1.3	0.3	3.3
PMPK	3.9	3.1	0.9	7.9
Daily	13.6	14.7	4.6	32.9

Period	SOV	HOV2	HOV3+	Total
AMSH	2.5	2.8	0.9	6.2
AMPK	1.6	3.6	1.2	6.4
MD	3.8	4.4	1.4	9.6
PMSH	1.6	1.4	0.4	3.4
PMPK	3.8	3.2	1.0	7.9
Daily	13.3	15.3	4.9	33.5

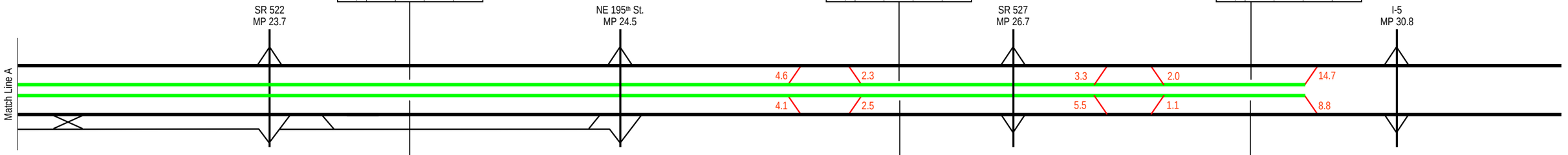
Period	SOV	HOV2	HOV3+	Total
AMSH	2.3	2.6	0.8	5.8
AMPK	1.5	3.3	1.2	6.0
MD	3.6	4.1	1.3	9.1
PMSH	1.5	1.2	0.3	3.1
PMPK	3.6	2.9	0.9	7.4
Daily	12.6	14.2	4.6	31.4

Period	SOV	HOV2	HOV3+	Total
AMSH	0.4	1.2	0.3	1.9
AMPK	0.9	1.8	0.5	3.2
MD	3.7	4.1	1.2	8.9
PMSH	1.3	2.1	0.6	4.0
PMPK	1.9	4.8	1.4	8.1
Daily	8.1	13.9	4.1	26.1

Period	SOV	HOV2	HOV3+	Total
AMSH	0.5	1.3	0.4	2.1
AMPK	1.0	1.9	0.6	3.5
MD	4.2	4.4	1.4	10.0
PMSH	1.6	2.3	0.7	4.6
PMPK	2.2	5.2	1.5	8.8
Daily	9.4	15.1	4.4	29.0

Period	SOV	HOV2	HOV3+	Total
AMSH	0.5	0.8	0.2	1.4
AMPK	1.1	1.1	0.3	2.5
MD	4.2	3.4	0.9	8.5
PMSH	1.4	2.4	0.7	4.4
PMPK	1.5	5.6	1.6	8.6
Daily	8.7	13.2	3.7	25.5

Period	SOV	HOV2	HOV3+	Total
AMSH	0.5	0.8	0.2	1.5
AMPK	1.2	1.2	0.3	2.7
MD	4.2	3.1	0.9	8.2
PMSH	1.3	2.3	0.6	4.2
PMPK	1.4	5.8	1.7	9.0
Daily	8.6	13.2	3.7	25.5



Period	SOV	HOV2	HOV3+	Total
AMSH	0.8	1.8	0.6	3.1
AMPK	0.4	1.9	0.6	2.9
MD	1.6	3.3	1.1	5.9
PMSH	0.8	0.9	0.2	1.9
PMPK	1.8	2.0	0.6	4.4
Daily	5.4	9.8	3.1	18.3

Period	SOV	HOV2	HOV3+	Total
AMSH	0.7	1.5	0.5	2.7
AMPK	0.4	1.4	0.5	2.3
MD	1.3	3.0	1.0	5.3
PMSH	0.6	0.8	0.2	1.6
PMPK	1.8	1.8	0.6	4.1
Daily	4.8	8.5	2.7	16.0

Period	SOV	HOV2	HOV3+	Total
AMSH	0.5	1.5	0.5	2.5
AMPK	0.4	1.8	0.6	2.9
MD	0.9	2.8	1.0	4.7
PMSH	0.4	0.7	0.2	1.3
PMPK	1.2	1.6	0.7	3.4
Daily	3.4	8.4	3.0	14.7

Period	SOV	HOV2	HOV3+	Total
AMSH	0.4	0.5	0.1	1.1
AMPK	1.1	0.8	0.2	2.2
MD	2.9	1.8	0.5	5.1
PMSH	0.6	1.2	0.3	2.1
PMPK	0.4	3.0	0.9	4.4
Daily	5.5	7.4	2.0	14.9

Period	SOV	HOV2	HOV3+	Total
AMSH	0.4	0.5	0.1	1.1
AMPK	1.3	1.0	0.3	2.6
MD	2.6	1.4	0.4	4.4
PMSH	0.6	1.0	0.3	1.8
PMPK	0.4	2.3	0.7	3.4
Daily	5.2	6.2	1.8	13.2

Period	SOV	HOV2	HOV3+	Total
AMSH	0.2	0.4	0.1	0.7
AMPK	0.9	0.6	0.2	1.7
MD	1.7	0.7	0.2	2.5
PMSH	0.4	0.5	0.3	1.1
PMPK	0.3	1.4	0.9	2.6
Daily	3.6	3.6	1.6	8.8

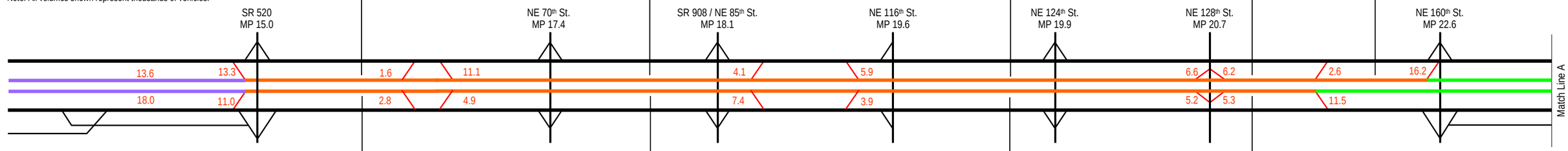
LEGEND

- 1 Lane Express Toll Lane
- 2 Lane Express Toll Lane
- HOV Lane
- General Purpose Lanes

0.0 Express Lane Ramp Total Weekday Volumes (does not include night)

AMSH (AM Shoulder) 5:00-6:30 AM, 8:30-9:30 AM
AMPK (AM Peak) 6:30-8:30 AM
MD (Midday) 9:30 AM-2:30 PM
PMSH (PM Shoulder) 2:30-3:30 PM, 6:30-7:00 PM
PMPK (PM Peak) 3:30-6:30 PM
WeekdayTotal 5:00 AM-7:00 PM Weekday Volume

Note: All volumes shown represent thousands of vehicles.



Period	SOV	HOV2	HOV3+	Total
AMSH	1.7	1.9	0.6	4.2
AMPK	1.4	2.5	0.7	4.7
MD	4.2	2.9	1.1	8.2
PMSH	1.8	1.2	0.2	3.3
PMPK	3.3	2.5	0.8	6.6
Daily	12.4	11.1	3.4	26.9

Period	SOV	HOV2	HOV3+	Total
AMSH	2.4	2.5	0.8	5.8
AMPK	2.0	3.1	1.0	6.0
MD	5.7	3.8	1.5	11.1
PMSH	2.6	1.4	0.3	4.3
PMPK	4.8	3.4	1.1	9.3
Daily	17.5	14.3	4.6	36.4

Period	SOV	HOV2	HOV3+	Total
AMSH	2.3	3.1	1.0	6.4
AMPK	1.6	3.5	1.1	6.2
MD	5.7	4.8	1.8	12.2
PMSH	2.4	1.5	0.4	4.3
PMPK	4.2	3.8	1.2	9.2
Daily	16.1	16.7	5.5	38.3

Period	SOV	HOV2	HOV3+	Total
AMSH	2.4	3.1	1.0	6.5
AMPK	1.6	3.7	1.2	6.5
MD	5.4	4.6	1.7	11.7
PMSH	2.4	1.6	0.4	4.4
PMPK	3.9	3.6	1.2	8.8
Daily	15.6	16.7	5.5	37.8

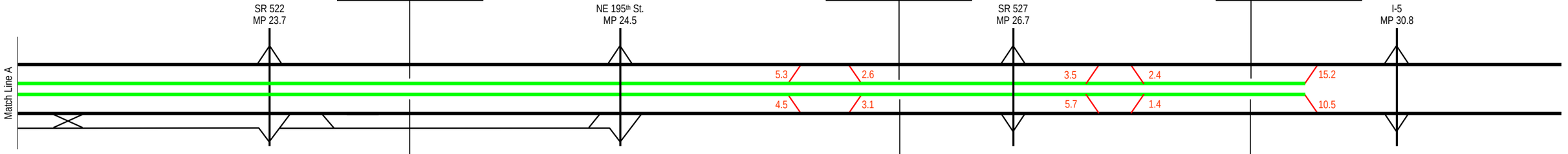
Period	SOV	HOV2	HOV3+	Total
AMSH	2.2	2.9	0.9	6.1
AMPK	1.5	3.3	1.1	5.9
MD	5.1	4.4	1.6	11.1
PMSH	2.3	1.4	0.4	4.0
PMPK	3.7	3.3	1.1	8.1
Daily	14.8	15.4	5.1	35.3

Period	SOV	HOV2	HOV3+	Total
AMSH	0.5	1.4	0.4	2.3
AMPK	1.1	2.0	0.5	3.6
MD	3.9	4.7	1.6	10.3
PMSH	1.1	2.5	0.6	4.3
PMPK	1.3	5.6	1.7	8.6
Daily	7.9	16.3	4.8	29.0

Period	SOV	HOV2	HOV3+	Total
AMSH	0.6	1.5	0.4	2.5
AMPK	1.2	2.0	0.5	3.8
MD	4.3	4.9	1.7	10.9
PMSH	1.4	2.6	0.7	4.7
PMPK	1.5	6.0	1.7	9.2
Daily	8.9	17.1	5.1	31.1

Period	SOV	HOV2	HOV3+	Total
AMSH	0.6	1.0	0.2	1.9
AMPK	1.4	1.3	0.3	2.9
MD	4.4	3.9	1.2	9.5
PMSH	1.1	2.7	0.7	4.5
PMPK	1.0	6.1	1.8	8.8
Daily	8.5	14.8	4.2	27.6

Period	SOV	HOV2	HOV3+	Total
AMSH	0.6	1.1	0.3	2.0
AMPK	1.4	1.4	0.3	3.1
MD	4.4	3.6	1.2	9.2
PMSH	1.0	2.5	0.7	4.3
PMPK	1.0	6.2	1.9	9.1
Daily	8.5	14.9	4.3	27.7



Period	SOV	HOV2	HOV3+	Total
AMSH	0.8	1.9	0.6	3.3
AMPK	0.4	1.8	0.6	2.9
MD	2.2	3.2	1.1	6.6
PMSH	0.9	1.0	0.2	2.1
PMPK	1.4	2.2	0.7	4.3
Daily	5.8	10.0	3.3	19.1

Period	SOV	HOV2	HOV3+	Total
AMSH	0.7	1.6	0.5	2.7
AMPK	0.4	1.3	0.4	2.2
MD	1.7	3.1	1.0	5.8
PMSH	0.7	0.8	0.2	1.8
PMPK	1.4	1.8	0.6	3.9
Daily	4.9	8.6	2.8	16.4

Period	SOV	HOV2	HOV3+	Total
AMSH	0.5	1.5	0.5	2.5
AMPK	0.4	1.7	0.6	2.7
MD	1.2	2.9	1.1	5.1
PMSH	0.4	0.8	0.3	1.5
PMPK	0.9	1.7	0.8	3.4
Daily	3.4	8.6	3.2	15.2

Period	SOV	HOV2	HOV3+	Total
AMSH	0.5	0.6	0.2	1.4
AMPK	1.3	0.9	0.2	2.5
MD	3.0	2.1	0.7	5.9
PMSH	0.5	1.4	0.3	2.2
PMPK	0.3	3.2	0.9	4.3
Daily	5.7	8.2	2.3	16.2

Period	SOV	HOV2	HOV3+	Total
AMSH	0.6	0.7	0.2	1.4
AMPK	1.6	1.1	0.3	3.1
MD	2.8	1.7	0.6	5.0
PMSH	0.4	1.1	0.3	1.8
PMPK	0.3	2.4	0.8	3.5
Daily	5.7	7.0	2.1	14.8

Period	SOV	HOV2	HOV3+	Total
AMSH	0.4	0.5	0.1	1.0
AMPK	1.2	0.8	0.3	2.2
MD	1.9	0.9	0.4	3.2
PMSH	0.3	0.6	0.3	1.2
PMPK	0.2	1.6	1.0	2.8
Daily	4.0	4.3	2.2	10.5

It is also interesting to break midday traffic volume growth into its SOV and HOV components. Total HOV trips in the micro-model trip table grow at an average annual rate of about 1.6 percent; total SOV trips grow at about 1.0 percent annually. During the midday periods, when the express toll lanes are relatively unconstrained, HOV traffic in the express toll lanes grows by about one to two percent per year over the forecast period. This just about matches the overall background growth in HOV traffic. SOV traffic, on the other hand, grows by four to five percent during the midday period between 2010 and 2030, much greater than the overall background growth in SOV traffic. The combination of increasing values of time and increasing GP lane congestion result in much greater shifts of SOV traffic into the express toll lanes over time than can be explained by general trip table growth alone.

Appendix D of this report provides information similar to that in Figures 5-5 through 5-8, but with additional detail. In the appendix D figures, ramp as well as mainline traffic volumes are provided by time period and vehicle class.

SOV Market Share Analysis

This section describes the market share of SOVs the model assigns to the express toll lanes. In this case, market share reflects the percentage of SOVs in the express toll lanes. SOVs will be permitted to buy into the express toll lanes if there is available capacity. Table 5-3 and Figures 5-9 and 5-10 summarize the anticipated average weekday market share of SOVs on the entire express toll lane system for model years 2010, 2020, and 2030. The percentage is shown by time period and direction of travel.

Table 5-3
Percent Trips on Average Weekday Made By Single Occupant Vehicles (SOVs) in Express Toll Lanes on I-405

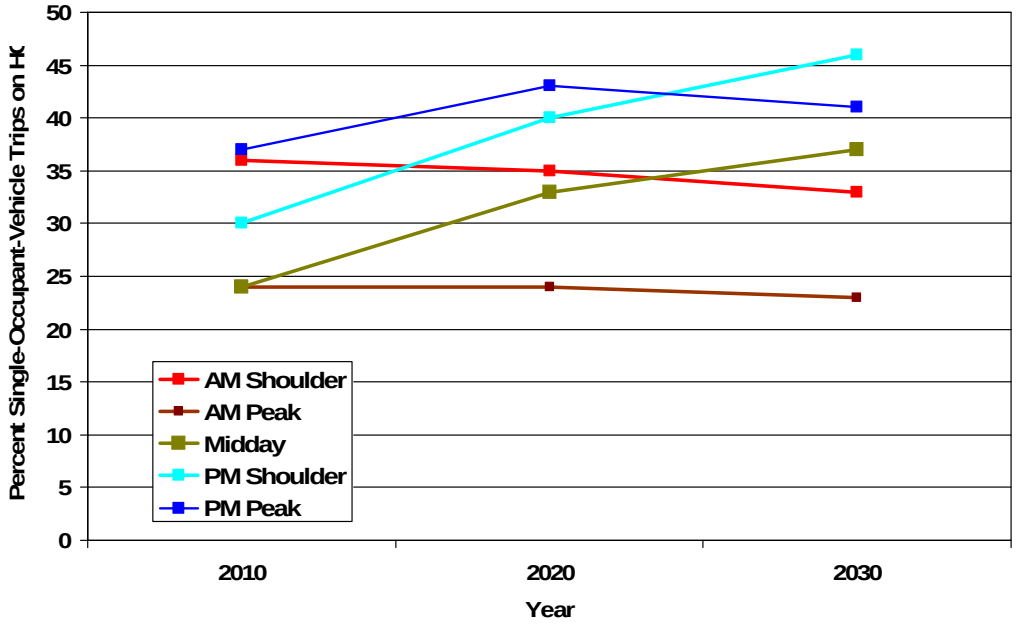
	Percent SOV Trips					
	Southbound Trips			Northbound Trips		
Time Period	2010	2020	2030	2010	2020	2030
AM Shoulder	36	35	33	14	19	21
AM Peak	24	24	23	18	30	33
Midday	24	33	37	21	34	32
PM Shoulder	30	40	46	27	25	21
PM Peak	37	43	41	23	17	12
Total Weekday	30	35	36	22	25	23

Note: Each value in this table represents the percent that SOVs make up of total traffic in the Express Toll Lanes during the time period shown.

In the southbound direction, SOVs are estimated to account for 30 percent of all weekday trips on the express toll lanes in 2010; 35 percent in 2020; and 36 percent in 2030. In the northbound direction, SOVs are estimated to account for 22 percent of all weekday trips on the express toll lanes in 2010; 25 percent in 2020; and 23 percent in 2030.

Figure 5-9 shows the SOV market share by time period and year for southbound trips. In the southbound direction, the peak travel demand between I-5 and SR 520 occurs in the morning, as motorists travel to Bellevue, Redmond, and Seattle from points north. I-405 currently experiences congestion in the GP and HOV lanes during the morning peak periods. With the addition of express toll lanes, the percentage of SOVs is anticipated to be lowest in the morning peak period due to large demand from HOV vehicles. The SOV percentage during the southbound morning peak period is estimated to total 24 percent in 2010 and 2020; and 23 percent in 2030. During the morning shoulder period, the SOV percentage declines between 2010 and 2030. This occurs as demand from HOV vehicles slowly increases due to a widening peak period, which limits available capacity for SOVs to buy into. The SOV percentage during the morning shoulder period is anticipated to total 36 percent in 2010; 35 percent in 2020; and 33 percent in 2030.

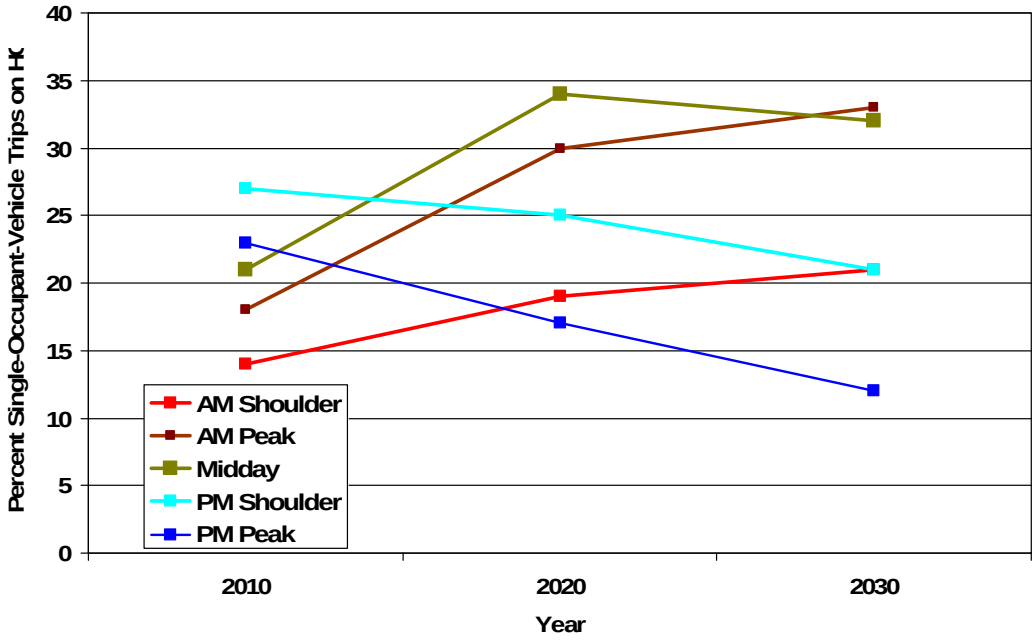
Figure 5-9
Percent SOV Trips on Total HOT Lane System
Southbound Trips - Average Weekday



During the southbound midday and evening shoulder periods, the SOV market share is estimated to increase as congestion in the GP lanes creates an incentive for an increasing number of SOVs to buy into the Express Toll Lanes. The SOV percentage in the midday period is anticipated to total 24 percent in 2010, increasing to 37 percent in 2030. The SOV percentage in the evening shoulder period is anticipated to be consistently higher than the midday period because there is more congestion in the GP lanes. During the evening peak period, which has a much lower travel demand than the morning peak period, the express toll lanes are anticipated to have enough available capacity to accommodate an increasing number of SOVs through 2020. The SOV percentage is estimated to increase from 37 percent to 43 percent between 2010 and 2020. From 2020 to 2030, the SOV percentage is anticipated to decrease to 41 percent, as HOV demand limits the availability for SOVs to buy in.

Figure 5-10 shows the SOV percentage by time period and year for northbound trips. In the northbound direction, the peak travel demand from SR 520 north to I-5 occurs in the evening, as motorists travel from Seattle, Redmond and Bellevue to points north. Both the GP lanes and the HOV lanes currently experience congestion during the evening peak periods. With the addition of express toll lanes, the percentage of SOVs in the evening peak period is anticipated to total 23 percent in 2010; 17 percent in 2020; and 12 percent in 2030. The decrease is attributed to the lack of available capacity in the express toll lanes due to an increase in HOV demand. The SOV percentage during the evening shoulder period is anticipated to decrease from 27 percent in 2010 to 21 percent in 2030, also due to increasing HOV demand.

Figure 5-10
Percent SOV Trips on Total HOT Lane System
Northbound Trips - Average Weekday



The SOV percentage in the midday period is estimated to increase from 21 percent in 2010 to 34 percent in 2020, and then gradually decrease to 32 percent in 2030. The increase is caused by congestion in the GP lanes and by travel time. The decrease between 2020 and 2030 is due to capacity limitations, as HOV vehicles limit available buy in opportunities for SOVs. The SOV percentage is estimated to increase during the morning peak and shoulder periods throughout the forecast period. This occurs because enough available capacity exists in the non-peak direction time periods to allow continued buy in opportunities by SOVs.

While this section has described the market share of SOVs in the total express toll lane system, the major constraint occurs in the northern section where only a single express toll lane is available in each direction. The HOV demand significantly limits the ability of SOVs to buy into the express toll lanes during peak periods, particularly in the single-express toll lane section. For example, in 2020 in the southbound direction on the express toll lane south of NE 195th Street, in the A.M. peak period (6:30 – 8:30 A.M.), there is only the capacity for about 200 SOVs to buy into the express toll lanes per hour. The rest of the space is filled by HOVs. In the same location in the southbound direction, during the P.M. peak period (3:30 – 6:30 P.M.), there is only room for about 130 SOVs to buy into the express toll lanes each hour. The single lane section acts as a major constraint to accommodate SOVs into the express toll lanes. The market share of SOVs can be

determined for each time period by mainline section of the express toll lanes in Figures 5-5 through 5-8.

ESTIMATED TRAFFIC AND GROSS TOLL REVENUE BY PERIOD

Once estimates of toll and toll-free traffic were developed for each time period and model year, estimates of annual gross toll revenue were developed. Tables 5-4 through 5-7 show the estimated annual gross toll revenue for 2010, 2014, 2020 and 2030, respectively. As noted in the Basic Assumption section of this chapter, WSA assumes that effective violation enforcement will be implemented on the express toll lanes. These revenue forecasts were developed assuming revenue losses due to violations would be negligible. No violations related reductions in annual gross toll revenue were assumed in the forecasts developed for this study.

In this study, annual toll revenue estimates are provided in both *current dollars* and *constant 2007 dollars*. Current dollars are defined as the dollar value at the time of the purchase, so the estimated annual toll revenue in 2010 reflects the value of the toll revenue in 2010 dollars. Constant dollars reflect the dollar value adjusted to a base year (2007 in this case) to eliminate changes in price due to inflation.

Table 5-4 shows that a total of approximately 21,000 weekday toll transactions are anticipated in the express toll lanes in 2010. An average toll of $1.80 per trip generates average weekday gross revenue of approximately $37,700 (in current dollars).

Estimated annual toll revenue was calculated based on the assumption of 250 weekdays per year. The remaining 115 weekend and holiday days would reflect a much lower demand profile. No modeling was available for this period, and only a nominal amount of toll revenue was assumed to be collected during these days. Each weekend and holiday day were assumed to generate revenue of only two percent of the average weekday revenue. Using these assumptions, annual gross toll revenue in 2010 is anticipated to total approximately $9.5 million (in current dollars). While ramp-up impacts will be applied to the final annual revenue stream during the early years of operation, they are not reflected in the 2010 traffic assignment values shown in Table 5-3.

Table 5-5 shows that a total of approximately 22,700 weekday toll transactions are anticipated in the express toll lanes in 2014. An average toll of $2.14 per trip generates annual gross toll revenue of approximately $12.2 million (in current dollars).

Table 5-6 shows that a total of approximately 27,600 weekday toll transactions are anticipated in the express toll lanes in 2020. An average toll of $2.30 per trip generates annual gross toll revenue of approximately $16.0 million (in current dollars).

Table 5-4
2010 Estimated Traffic and Gross Toll Revenue
I-405 Express Toll Lanes

All Revenue Values in Current Dollars

Northbound Direction

Period	Average Weekday Traffic: Toll Free	Tolled	Total	Average Weekday Toll Rate	Average Weekday Revenue	Estimated Annual Toll Revenue
AM Shoulder	2,224	359	2,583	$0.62	$222	$56,000
AM Peak	3,590	775	4,365	0.61	473	119,300
Midday	8,643	2,276	10,919	0.62	1,415	357,000
PM Shoulder	4,854	1,800	6,654	1.69	3,036	766,000
PM Peak	11,213	3,398	14,611	3.76	12,769	3,221,600
Total	30,524	8,608	39,132	$2.08	$17,915	$4,519,900

Southbound Direction

Period	Average Weekday Traffic: Toll Free	Tolled	Total	Average Weekday Toll Rate	Average Weekday Revenue	Estimated Annual Toll Revenue
AM Shoulder	4,762	2,699	7,461	$1.59	$4,304	$1,085,900
AM Peak	7,252	2,250	9,502	4.96	11,155	2,814,400
Midday	7,911	2,477	10,388	0.55	1,373	346,400
PM Shoulder	2,640	1,136	3,776	0.57	646	163,000
PM Peak	6,362	3,808	10,170	0.61	2,336	589,400
Total	28,927	12,370	41,297	$1.60	$19,814	$4,999,100

Both Directions

Period	Average Weekday Traffic: Toll Free	Tolled	Total	Average Weekday Toll Rate	Average Weekday Revenue	Estimated Annual Toll Revenue
AM Shoulder	6,986	3,058	10,044	$1.48	$4,526	$1,141,900
AM Peak	10,842	3,025	13,867	3.84	11,628	2,933,700
Midday	16,554	4,753	21,307	0.59	2,788	703,400
PM Shoulder	7,494	2,936	10,430	1.25	3,682	929,000
PM Peak	17,575	7,206	24,781	2.10	15,105	3,811,000
Total	59,451	20,978	80,429	$1.80	$37,729	$9,519,000

Table 5-5
2014 Estimated Traffic and Gross Toll Revenue
I-405 Express Toll Lanes

All Revenue Values in Current Dollars

Northbound Direction

Period	Average Weekday Traffic: Toll Free	Tolled	Total	Average Weekday Toll Rate	Average Weekday Revenue	Estimated Annual Toll Revenue
AM Shoulder	2,340	407	2,747	$0.67	$272	$68,600
AM Peak	3,557	1,100	4,657	0.67	740	186,700
Midday	8,737	3,134	11,871	0.68	2,131	537,700
PM Shoulder	4,987	1,800	6,787	2.52	4,544	1,146,500
PM Peak	11,933	2,734	14,667	5.99	16,377	4,131,900
Total	31,554	9,175	40,729	$2.62	$24,064	$6,071,400

Southbound Direction

Period	Average Weekday Traffic: Toll Free	Tolled	Total	Average Weekday Toll Rate	Average Weekday Revenue	Estimated Annual Toll Revenue
AM Shoulder	5,005	2,509	7,514	$2.08	$5,207	$1,313,700
AM Peak	7,284	2,287	9,571	5.74	13,121	3,310,400
Midday	8,299	2,892	11,191	0.64	1,852	467,300
PM Shoulder	2,743	1,406	4,149	0.65	910	229,600
PM Peak	6,447	4,452	10,899	0.75	3,361	848,000
Total	29,778	13,546	43,324	$1.81	$24,451	$6,169,000

Both Directions

Period	Average Weekday Traffic: Toll Free	Tolled	Total	Average Weekday Toll Rate	Average Weekday Revenue	Estimated Annual Toll Revenue
AM Shoulder	7,345	2,916	10,261	$1.88	$5,479	$1,382,400
AM Peak	10,841	3,387	14,228	4.09	13,861	3,497,100
Midday	17,036	6,026	23,062	0.66	3,983	1,004,900
PM Shoulder	7,730	3,206	10,936	1.70	5,454	1,376,000
PM Peak	18,380	7,186	25,566	2.75	19,738	4,979,900
Total	61,332	22,721	84,053	$2.14	$48,515	$12,240,300

Table 5-6
2020 Estimated Traffic and Gross Toll Revenue
I-405 Express Toll Lanes

All Revenue Values in Current Dollars

Northbound Direction

Period	Average Weekday Traffic: Toll Free	Tolled	Total	Average Weekday Toll Rate	Average Weekday Revenue	Estimated Annual Toll Revenue
AM Shoulder	2,489	588	3,077	$0.75	$441	$111,300
AM Peak	3,638	1,571	5,209	0.75	1,177	297,000
Midday	9,110	4,606	13,716	0.75	3,454	871,400
PM Shoulder	5,204	1,751	6,955	3.91	6,844	1,726,700
PM Peak	12,630	2,550	15,180	7.55	19,242	4,854,800
Total	33,071	11,066	44,137	$2.82	$31,158	$7,861,200

Southbound Direction

Period	Average Weekday Traffic: Toll Free	Tolled	Total	Average Weekday Toll Rate	Average Weekday Revenue	Estimated Annual Toll Revenue
AM Shoulder	5,275	2,828	8,103	$2.96	$8,357	$2,108,500
AM Peak	7,342	2,285	9,627	6.32	14,430	3,640,700
Midday	8,824	4,434	13,258	0.75	3,325	838,900
PM Shoulder	2,910	1,963	4,873	0.75	1,472	371,400
PM Peak	6,657	5,021	11,678	0.97	4,848	1,223,200
Total	31,008	16,531	47,539	$1.96	$32,432	$8,182,700

Both Directions

Period	Average Weekday Traffic: Toll Free	Tolled	Total	Average Weekday Toll Rate	Average Weekday Revenue	Estimated Annual Toll Revenue
AM Shoulder	7,764	3,416	11,180	$2.58	$8,798	$2,219,700
AM Peak	10,980	3,856	14,836	4.05	15,607	3,937,600
Midday	17,934	9,040	26,974	0.75	6,779	1,710,300
PM Shoulder	8,114	3,714	11,828	2.24	8,316	2,098,100
PM Peak	19,287	7,571	26,858	3.18	24,090	6,077,900
Total	64,079	27,597	91,676	$2.30	$63,590	$16,043,600

Table 5-7
2030 Estimated Traffic and Gross Toll Revenue
I-405 Express Toll Lanes

All Revenue Values in Current Dollars

Northbound Direction

Period	Average Weekday Traffic: Toll Free	Tolled	Total	Average Weekday Toll Rate	Average Weekday Revenue	Estimated Annual Toll Revenue
AM Shoulder	2,976	805	3,781	$1.00	$805	$203,100
AM Peak	3,979	1,958	5,937	1.00	1,957	493,800
Midday	10,500	4,876	15,376	1.00	4,876	1,230,200
PM Shoulder	5,668	1,485	7,153	7.16	10,631	2,682,200
PM Peak	13,451	1,758	15,209	11.98	21,067	5,315,200
Total	36,574	10,882	47,456	$3.61	$39,336	$9,924,500

Southbound Direction

Period	Average Weekday Traffic: Toll Free	Tolled	Total	Average Weekday Toll Rate	Average Weekday Revenue	Estimated Annual Toll Revenue
AM Shoulder	5,933	2,865	8,798	$5.15	$14,752	$3,721,900
AM Peak	7,441	2,275	9,716	8.78	19,964	5,036,900
Midday	10,265	6,131	16,396	1.00	6,131	1,546,900
PM Shoulder	3,424	2,950	6,374	1.15	3,399	857,600
PM Peak	8,032	5,465	13,497	1.94	10,598	2,673,900
Total	35,095	19,686	54,781	$2.79	$54,844	$13,837,200

Both Directions

Period	Average Weekday Traffic: Toll Free	Tolled	Total	Average Weekday Toll Rate	Average Weekday Revenue	Estimated Annual Toll Revenue
AM Shoulder	8,909	3,670	12,579	$4.24	$15,557	$3,925,000
AM Peak	11,420	4,233	15,653	5.18	21,921	5,530,700
Midday	20,765	11,007	31,772	1.00	11,007	2,777,100
PM Shoulder	9,092	4,435	13,527	3.16	14,030	3,539,800
PM Peak	21,483	7,223	28,706	4.38	31,665	7,989,100
Total	71,669	30,568	102,237	$3.08	$94,180	$23,761,700

Table 5-7 shows that a total of approximately 30,600 weekday toll transactions are anticipated in the express toll lanes in 2030. An average toll of $3.08 per trip generates annual gross toll revenue of approximately $23.8 million (in current dollars).

Estimated Annual Traffic and Gross Toll Revenue

Table 5-8 shows the final composite of annual traffic and toll revenue for the Base Case express toll lane scenario. The traffic and revenue values developed for 2010, 2014, 2020 and 2030 are included, as well as values for all of the intermediate years developed by linear interpolation between values for each of the four model years.

The only difference in Table 5-8 is that ramp-up impacts have been factored into the 2010 values. The ramp-up impacts are noted in the footnote to Table 5-8. As shown there, tolled traffic and revenue values were reduced by 30 percent in 2010 and by ten percent in 2011, to account for the time it will take motorists to become accustomed to the new travel options and technologies required to use them.

Annual revenue forecasts are expressed both in terms of current and constant dollars. As shown in the final column of Table 5-8, over the 20 year forecast period, annual gross toll revenue is estimated to total nearly $236.8 million in constant 2007 dollars assuming an inflation rate of 2.5 percent per year from 2010 to 2030. The average annual rate of toll revenue growth over this time period amounts to 6.6 percent in current dollars and by 4.0 percent in constant dollars. Of that growth, about 3.7 percentage points are accounted for by the growth in tolled traffic and the remaining growth is accounted for by increases in the average toll rate.

Estimated Sensitivity Test Gross Toll Revenue

Tables 5-9 through 5-11 show similar information for each of the sensitivity test conducted as part of this analysis. The three sensitivity tests include:

Sensitivity Test One: SOV traffic is banned from the NE 128th Street direct access ramps;

Sensitivity Test Two: Express toll lanes are extended to the NE 6th Street direct access ramps; and

Sensitivity Test Three: Reflects a combination of the SOV ban at the NE 128th Street direct access ramps and extending the express toll lanes to NE 6th Street.

A summary of the estimated annual gross toll revenue streams for the Base Case as well as the three alternative scenarios is provided in Table 5-12. This allows for a better direct comparison of each alternative scenario compared to the Base Case. All values shown in this table are in constant 2007 dollars.

Table 5-8

Estimated Base Case I-405 Express Toll Lane Traffic and Gross Toll Revenue

Annual Revenue in Thousands of Current and Constant (2007) Dollars

		Average Weekday Trips			Current	Average	Constant
		Toll	Toll-Free	Total	Annual Toll	Weekday	Annual Toll
Year		Trips	Trips	Trips	Revenue (2)	Toll	Revenue (3)
2010	(1)	14,685	59,451	74,136	$6,663	$1.80	$6,188
2011	(1)	19,261	59,916	79,176	9,123	1.88	8,265
2012		21,832	60,384	82,216	10,794	1.96	9,541
2013		22,272	60,856	83,128	11,495	2.05	9,912
2014		22,721	61,332	84,053	12,240	2.14	10,297
2015		23,469	61,782	85,251	12,805	2.16	10,510
2016		24,242	62,234	86,477	13,396	2.19	10,726
2017		25,041	62,690	87,731	14,014	2.22	10,947
2018		25,865	63,150	89,015	14,660	2.25	11,173
2019		26,717	63,613	90,330	15,336	2.28	11,403
2020		27,597	64,079	91,676	16,044	2.30	11,638
2021		27,881	64,800	92,681	16,686	2.37	11,809
2022		28,167	65,530	93,697	17,355	2.44	11,983
2023		28,457	66,267	94,724	18,050	2.51	12,159
2024		28,749	67,013	95,763	18,773	2.59	12,338
2025		29,045	67,768	96,812	19,525	2.66	12,519
2026		29,343	68,531	97,874	20,307	2.74	12,703
2027		29,645	69,302	98,947	21,121	2.82	12,889
2028		29,949	70,082	100,032	21,967	2.91	13,079
2029		30,257	70,871	101,128	22,846	2.99	13,271
2030		30,568	71,669	102,237	23,762	3.08	13,466
Cumulative Revenue							**$236,815**

(1) Ramp-up adjustment factors are applied to tolled transactions and revenue for the first two years of operation. Adjustment factors for 2010 and 2011 are as follows: 2010 - 70% and 2011 - 90%.

(2) For the development of annual toll revenue, a nominal amount equal to 2 percent of average weekday toll revenue was added for each weekend day.

(3) This column represents the annual revenue stream in constant 2007 dollars, assuming a 2.5 percent annual discount rate.

Table 5-9
Estimated Sensitivity Test One I-405 Express Toll Lane Traffic and Gross Toll Revenue
SOV Ban at 128th Street Direct Access
Annual Revenue in Thousands of Current and Constant (2007) Dollars

Year		Average Weekday Trips: Toll Trips	Toll-Free Trips	Total Trips	Current Annual Toll Revenue (2)	Average Weekday Toll	Constant Annual Toll Revenue (3)
2010	(1)	14,219	59,451	73,670	$6,358	$1.77	$5,904
2011	(1)	18,656	59,916	78,572	8,708	1.85	7,889
2012		21,154	60,384	81,538	10,308	1.93	9,111
2013		21,588	60,856	82,444	10,982	2.02	9,469
2014		22,030	61,332	83,362	11,699	2.10	9,842
2015		22,758	61,782	84,539	12,231	2.13	10,038
2016		23,510	62,234	85,744	12,787	2.16	10,239
2017		24,286	62,690	86,977	13,368	2.18	10,443
2018		25,089	63,150	88,239	13,975	2.21	10,651
2019		25,918	63,613	89,530	14,610	2.23	10,863
2020		26,774	64,079	90,853	15,274	2.26	11,080
2021		27,014	64,800	91,815	15,869	2.33	11,231
2022		27,257	65,530	92,787	16,488	2.40	11,384
2023		27,502	66,267	93,769	17,130	2.47	11,539
2024		27,748	67,013	94,762	17,798	2.54	11,697
2025		27,998	67,768	95,765	18,492	2.62	11,856
2026		28,249	68,531	96,780	19,212	2.70	12,018
2027		28,502	69,302	97,805	19,961	2.78	12,182
2028		28,758	70,082	98,841	20,739	2.86	12,348
2029		29,017	70,871	99,888	21,548	2.94	12,516
2030		29,277	71,669	100,946	22,387	3.03	12,687
Cumulative Revenue							**$224,988**

(1) Ramp-up adjustment factors are applied to tolled transactions and revenue for the first two years of operation. Adjustment factors for 2010 and 2011 are as follows: 2010 - 70% and 2011 - 90%.

(2) For the development of annual toll revenue, a nominal amount equal to 2 percent of average weekday toll revenue was added for each weekend day.

(3) This column represents the annual revenue stream in constant 2007 dollars, assuming a 2.5 percent annual discount rate.

Table 5-10
Estimated Sensitivity Test Two I-405 Express Toll Lane Traffic and Gross Toll Revenue
Express Toll Lane Extension to NE 6th Street
Annual Revenue in Thousands of Current and Constant (2007) Dollars

		Average Weekday Trips			Current	Average	Constant
		Toll	Toll-Free	Total	Annual Toll	Weekday	Annual Toll
Year		Trips	Trips	Trips	Revenue (2)	Toll	Revenue (3)
2010	(1)	15,010	59,484	74,494	$6,817	$1.80	$6,330
2011	(1)	19,677	59,949	79,625	9,331	1.88	8,453
2012		22,292	60,417	82,708	11,037	1.96	9,755
2013		22,729	60,889	83,617	11,750	2.05	10,132
2014		23,174	61,364	84,538	12,510	2.14	10,524
2015		23,853	61,802	85,655	13,071	2.17	10,728
2016		24,551	62,243	86,794	13,657	2.20	10,936
2017		25,270	62,687	87,957	14,270	2.24	11,148
2018		26,010	63,135	89,145	14,910	2.27	11,364
2019		26,772	63,585	90,357	15,579	2.31	11,584
2020		27,556	64,039	91,595	16,278	2.34	11,809
2021		27,829	64,756	92,586	16,933	2.41	11,984
2022		28,105	65,482	93,587	17,614	2.48	12,162
2023		28,384	66,215	94,599	18,323	2.56	12,343
2024		28,665	66,957	95,622	19,059	2.64	12,526
2025		28,949	67,707	96,656	19,826	2.71	12,712
2026		29,236	68,465	97,702	20,623	2.80	12,901
2027		29,526	69,232	98,758	21,453	2.88	13,092
2028		29,819	70,008	99,827	22,316	2.97	13,286
2029		30,114	70,792	100,906	23,213	3.06	13,484
2030		30,413	71,585	101,998	24,147	3.15	13,684
Cumulative Revenue							**$240,936**

(1) Ramp-up adjustment factors are applied to tolled transactions and revenue for the first two years of operation. Adjustment factors for 2010 and 2011 are as follows: 2010 - 70% and 2011 - 90%.

(2) For the development of annual toll revenue, a nominal amount equal to 2 percent of average weekday toll revenue was added for each weekend day.

(3) This column represents the annual revenue stream in constant 2007 dollars, assuming a 2.5 percent annual discount rate.

Table 5-11

Estimated Sensitivity Test Three I-405 Express Toll Lane Traffic and Gross Toll Revenue

SOV Ban at 128th Street Direct Access and Express Toll Lane Extension to NE 6th Street

Annual Revenue in Thousands of Current and Constant (2007) Dollars

		Average Weekday Trips			Current	Average	Constant
		Toll	Toll-Free	Total	Annual Toll	Weekday	Annual Toll
Year		Trips	Trips	Trips	Revenue (2)	Toll	Revenue (3)
2010	(1)	14,545	59,484	74,029	$6,511	$1.77	$6,046
2011	(1)	19,073	59,949	79,021	8,916	1.85	8,077
2012		21,614	60,417	82,030	10,551	1.93	9,326
2013		22,044	60,889	82,933	11,237	2.02	9,690
2014		22,483	61,364	83,847	11,969	2.11	10,069
2015		23,141	61,802	84,943	12,497	2.14	10,257
2016		23,819	62,243	86,062	13,048	2.17	10,448
2017		24,516	62,687	87,203	13,624	2.20	10,643
2018		25,234	63,135	88,368	14,225	2.23	10,842
2019		25,973	63,585	89,558	14,853	2.27	11,044
2020		26,733	64,039	90,772	15,509	2.30	11,250
2021		26,963	64,756	91,719	16,116	2.37	11,406
2022		27,195	65,482	92,676	16,747	2.44	11,563
2023		27,428	66,215	93,644	17,403	2.51	11,723
2024		27,664	66,957	94,621	18,085	2.59	11,885
2025		27,902	67,707	95,609	18,793	2.67	12,049
2026		28,142	68,465	96,607	19,529	2.75	12,216
2027		28,384	69,232	97,616	20,294	2.83	12,385
2028		28,628	70,008	98,636	21,088	2.92	12,556
2029		28,874	70,792	99,666	21,914	3.01	12,729
2030		29,122	71,585	100,707	22,773	3.10	12,905
Cumulative Revenue							**$229,109**

(1) Ramp-up adjustment factors are applied to tolled transactions and revenue for the first two years of operation. Adjustment factors for 2010 and 2011 are as follows: 2010 - 70% and 2011 - 90%.

(2) For the development of annual toll revenue, a nominal amount equal to 2 percent of average weekday toll revenue was added for each weekend day.

(3) This column represents the annual revenue stream in constant 2007 dollars, assuming a 2.5 percent annual discount rate.

Table 5-12
Summary of I-405 Express Toll Lane Gross Toll Revenue

Annual Revenue in Thousands of Constant 2007 Dollars

Year		Base Case Annual Toll Revenue	Sensitivity Test One Annual Toll Revenue (2)	Sensitivity Test Two Annual Toll Revenue (3)	Sensitivity Test Three Annual Toll Revenue (4)
2010	(1)	$6,188	$5,904	$6,330	$6,046
2011	(1)	8,265	7,889	8,453	8,077
2012		9,541	9,111	9,755	9,326
2013		9,912	9,469	10,132	9,690
2014		10,297	9,842	10,524	10,069
2015		10,510	10,038	10,728	10,257
2016		10,726	10,239	10,936	10,448
2017		10,947	10,443	11,148	10,643
2018		11,173	10,651	11,364	10,842
2019		11,403	10,863	11,584	11,044
2020		11,638	11,080	11,809	11,250
2021		11,809	11,231	11,984	11,406
2022		11,983	11,384	12,162	11,563
2023		12,159	11,539	12,343	11,723
2024		12,338	11,697	12,526	11,885
2025		12,519	11,856	12,712	12,049
2026		12,703	12,018	12,901	12,216
2027		12,889	12,182	13,092	12,385
2028		13,079	12,348	13,286	12,556
2029		13,271	12,516	13,484	12,729
2030		13,466	12,687	13,684	12,905
Cum. Revenue		**$236,815**	**$224,988**	**$240,936**	**$229,109**
Variance from Base Case		**$0**	**($11,827)**	**$4,121**	**($7,706)**

(1) Ramp-up adjustment factors are applied to tolled transactions and revenue for the first two years of operation. Adjustment factors for 2010 and 2011 are as follows: 2010 - 70% and 2011 - 90%.

(2) Sensitivity Test One assumes SOV traffic is prohibited from using the 128th Street direct access ramps.

(3) Sensitivity Test Two assumes extension of the express toll lanes south to include access to and from the north at the NE 6th Street ramps.

(4) Sensitivity Test Three reflects a combination of banning SOV trips from 128th Street and extending express toll lanes to NE 6th Street.

As would be expected, eliminating toll paying SOV traffic from the NE 128th Street interchange (Sensitivity Test One) generates less gross toll revenue than the Base Case.

Total cumulative annual gross toll revenue in constant 2007 dollars amounts to $225.0 million; this represents about $11.8 million (5 percent) less cumulative gross toll revenue than the Base Case.

Extending the express toll lanes to the NE 6th Street direct access ramps (Sensitivity Test Two) results in greater gross toll revenue than is generated in the Base Case. Total cumulative annual gross toll revenue in constant 2007 dollars amounts to $240.9 million; this represents about $4.1 million (1.7 percent) more cumulative gross toll revenue than the Base Case.

The combined effect of eliminating toll paying SOV traffic from the NE 128th Street interchange and extending the express toll lanes to NE 6th Street (Sensitivity Test Three) generates less gross toll revenue than the Base Case. Total cumulative annual gross toll revenue in constant 2007 dollars amounts $229.1 million; this represents about $7.7 million (3.3 percent) less cumulative gross toll revenue than the Base Case.

OBSERVATIONS ON I-405 EXPRESS TOLL LANES

This section addresses some observations on express toll lane performance characteristics in the following areas:

- express toll lane mainline and access point operations;
- SOV response to tolling during congested peak periods; and
- Peak period spread of express toll lane demand.

EXPRESS TOLL LANES MAINLINE AND ACCESS POINT OPERATIONS

In the course of developing the estimated traffic and toll rates for the express toll lanes, WSA, with the assistance of WSDOT, observed certain conditions that caused the express toll lanes to operate without meeting their proposed operating conditions. As discussed in Chapter 5, Toll Rate Framework, Page 5-9, WSA developed average toll rates (base toll rates) that resulted in achieving a maximum target flow of 1,500 or 1,600 vehicles per hour per lane in the express toll lanes, for a single express toll lane or dual express toll lane section, respectively.

Achieving this target flow rate is important because it benefits both the express toll lanes and the GP lanes for the following reasons:

1. The target flow rates permit express toll lane traffic to travel at an average speed of approximately 45 miles per hour and maximize the usage of the express toll lanes.

2. The target flow rates result in the largest amount of traffic from the GP lanes to the express toll lanes, potentially improving GP lane conditions.

Once the base toll rates were established that optimized conditions on the express toll lane mainline segments, an operational analysis was conducted by WSDOT to determine how the express toll lane ingress and egress points operated. WSA provided trip table information to WSDOT for input into the VISSIM operational model. WSDOT determined that during certain time periods, traffic entering or exiting the express toll lanes to access SR 522 and NE 160th Street were high enough to cause significant weave and merge problems on the GP lanes. WSDOT also determined that the express toll lane traffic demand was too high to be accommodated on the local street network that feeds NE 128th Street. These problems occurred during morning and evening weekday commuting periods.

In order to reduce demand at these express toll lane access points, express toll lane traffic demand was reduced by raising tolls over the base toll rate for use of those access points. The increased toll "surcharge" was applied to the access points only during time periods when the demand on the access ramps created the observed operational problems on the GP lanes or the arterial. The surcharges resulted in decreased demand for the express toll lanes and improved operation at the access points. It also resulted in less efficient use of the GP lanes.

The net effect of reducing express toll lane demand on the SR 522, NE 160th Street, and NE 128th Street access ramps was to reduce express toll lane traffic flow below the target flow rate. Under ideal conditions, toll rates would decrease in other locations to allow more through trips to use the available capacity. This solution was often limited because the single lane section of express toll lanes (north of 160th Street to I-5) was often over capacity and therefore no more through trips could be accommodated on the I-405 express toll lanes.

These observations show that in order to maximize the efficiency of the I-405 express toll lanes, several improvements or combinations of improvements could be evaluated, including:

- The provision of direct access ramps that would accommodate traffic from SR 522 and/or NE160th Street,
- Roadway capacity improvements to NE 128th Street,
- Capacity improvements to I-405 between NE 160th Street and I-5.

SOV Response To Tolling During Congested Peak Periods

During the most congested time periods of the day, particularly in future years, such as 2020 and 2030, traffic demand for the express toll lanes becomes very high. During these congested time periods, the express toll lanes often have very little capacity left for SOVs to purchase. At the same time there is a population of motorists with high values of time

who are willing to pay large tolls for the remaining capacity in the express toll lanes. The SOV motorists become relatively insensitive to toll increases; therefore toll increases have increasingly little ability to influence their decision to buy into the express toll lanes. This brings up several policy decisions including whether to cap toll rates, the level at which they should be capped, or the possible temporary restriction of the express toll lanes to HOVs.

PEAK PERIOD SPREAD OF EXPRESS TOLL LANE DEMAND

A final observation has to do with the assumed hours of express toll lane operation. In this study, express toll lane operation reverted to toll-free GP lane operation after 7:00 p.m. Relatively high toll rates were required during the 6:30-7:00 p.m. analysis period in order to maintain free flow express toll lane conditions. This would suggest that additional traffic management through tolling may be required beyond 7:00 p.m. This would have the duel benefit of improved overall traffic flow after 7:00 p.m. and additional toll revenue generated by the express toll lanes.

DISCLAIMER

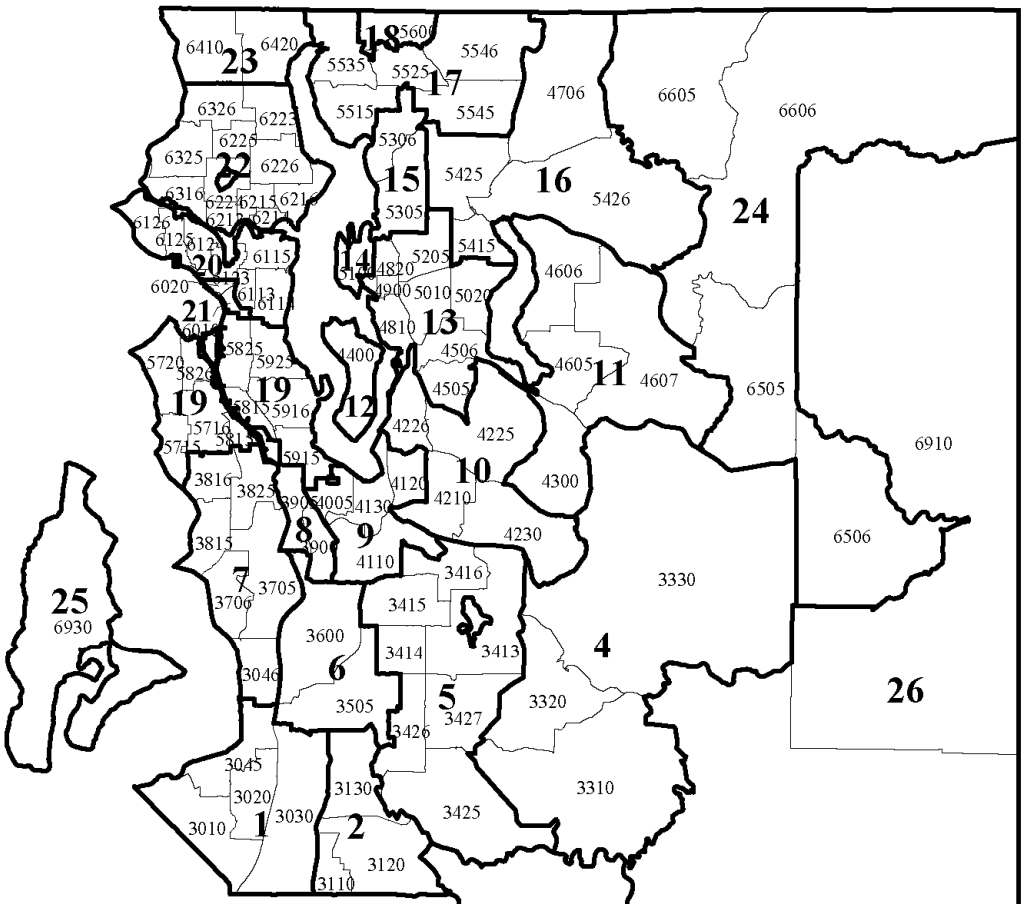
Current professional practices and procedures were used in the development of these findings. However, there is considerable uncertainty inherent in future traffic and revenue forecasts for any toll facility. There may sometimes be differences between forecasted and actual results caused by events and circumstances beyond the control of the forecasters.

These differences could be material. Also, it should be recognized that traffic and revenue forecasts in this document are intended to reflect the overall estimated long-term trend. Actual experience in any given year may vary due to economic conditions and other factors.

APPENDIX A:

PSRC FAZ GROUPS AND FAZs

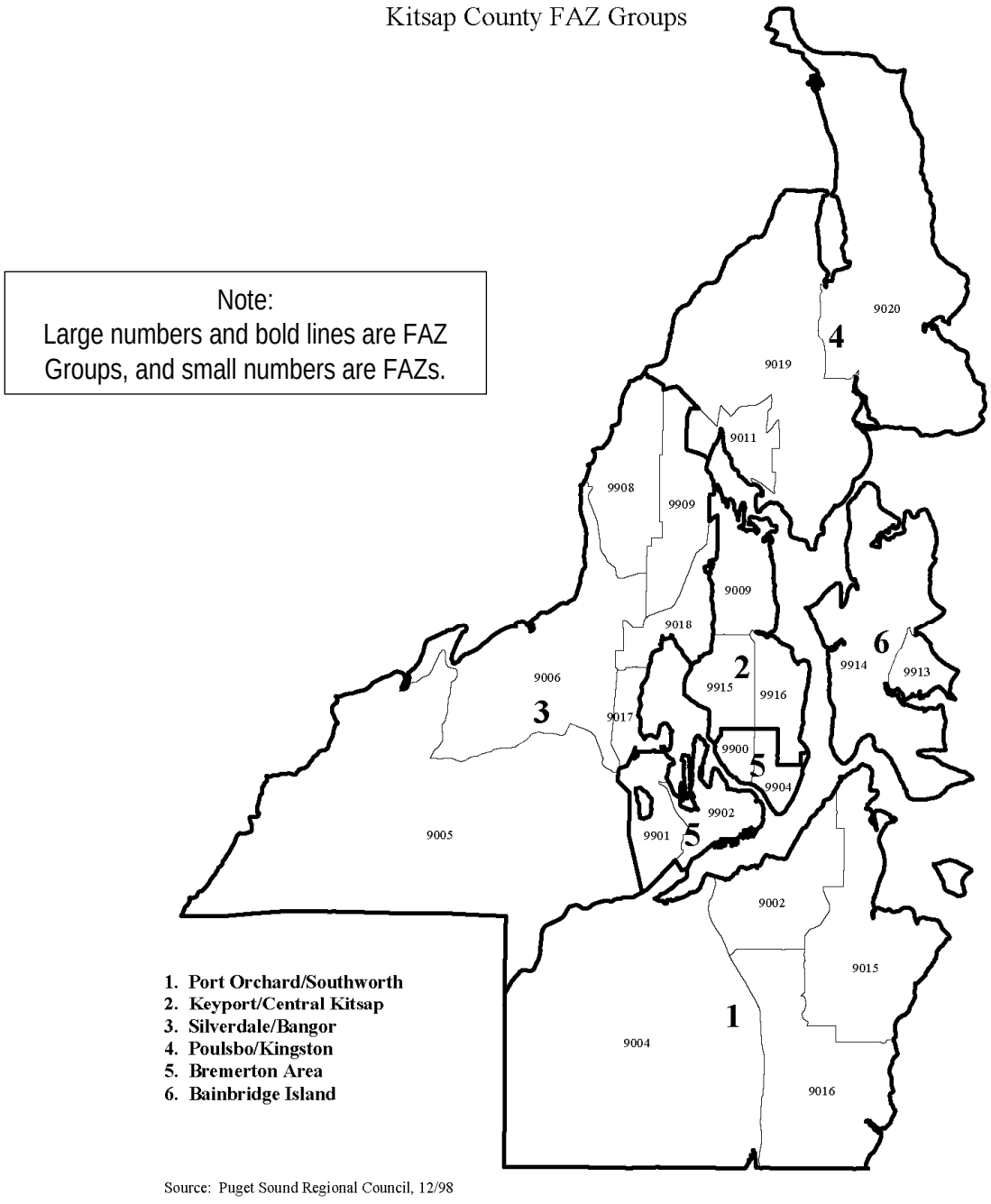
King County FAZ Groups



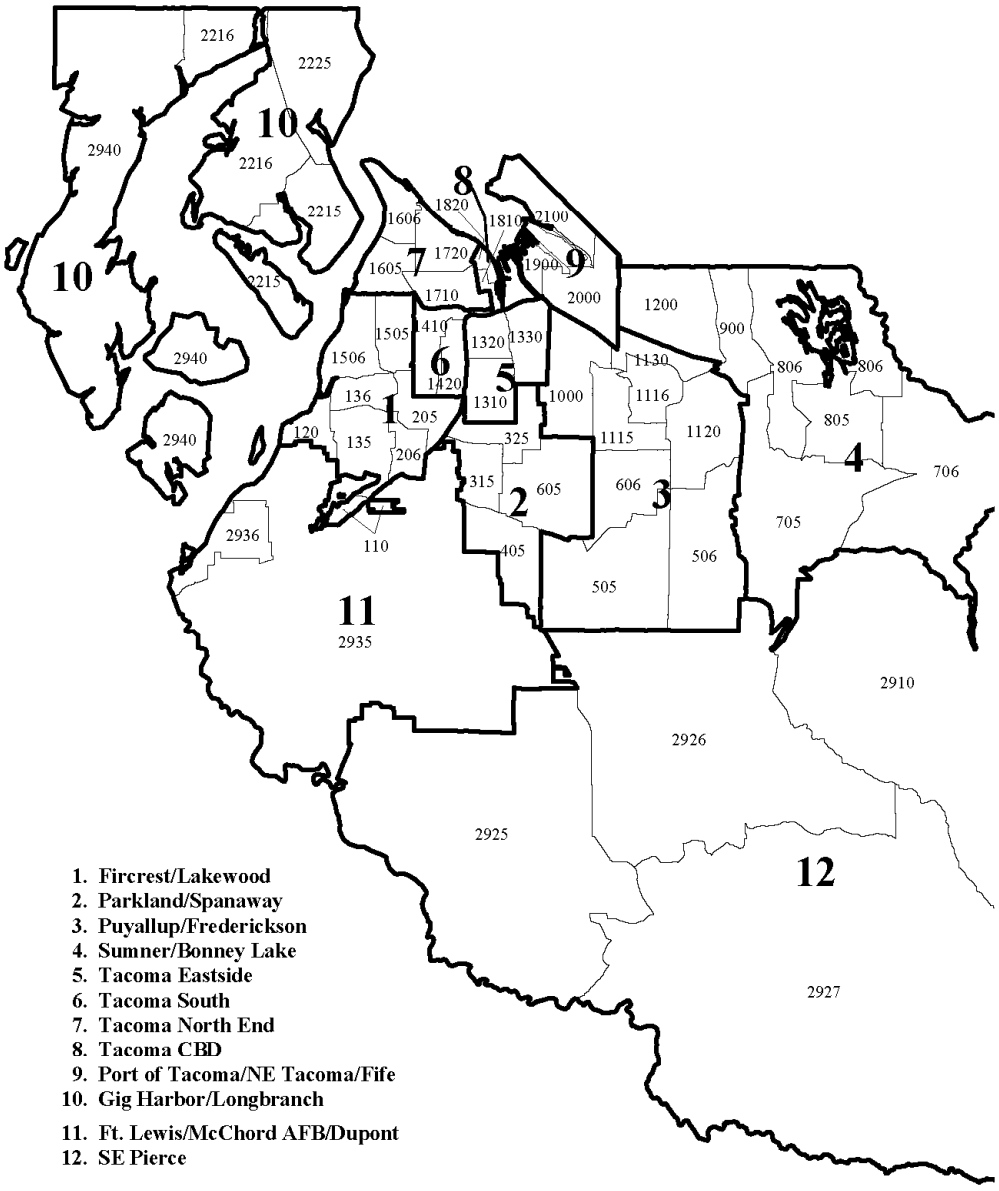
Source: Puget Sound Regional Council, 12/98

Note:
Large numbers and bold lines are FAZ Groups, and small numbers are FAZs.

King County, WA, FAZ Groups and FAZs


Kitsap County FAZ Groups
Note:
Large numbers and bold lines are FAZ Groups, and small numbers are FAZs.
1. Port Orchard/Southworth
2. Keyport/Central Kitsap
3. Silverdale/Bangor
4. Poulsbo/Kingston
5. Bremerton Area
6. Bainbridge Island
Source: Puget Sound Regional Council, 12/98
9020
4
9019
9011
9908
9909
9009
9018
9006
3
9017
2
9915
9916
9914
9913
6
9900
5
9904
9902
9901
5
9005
9002
9015
1
9004
9016

Pierce County FAZ Groups



Source: Puget Sound Regional Council, 12/98

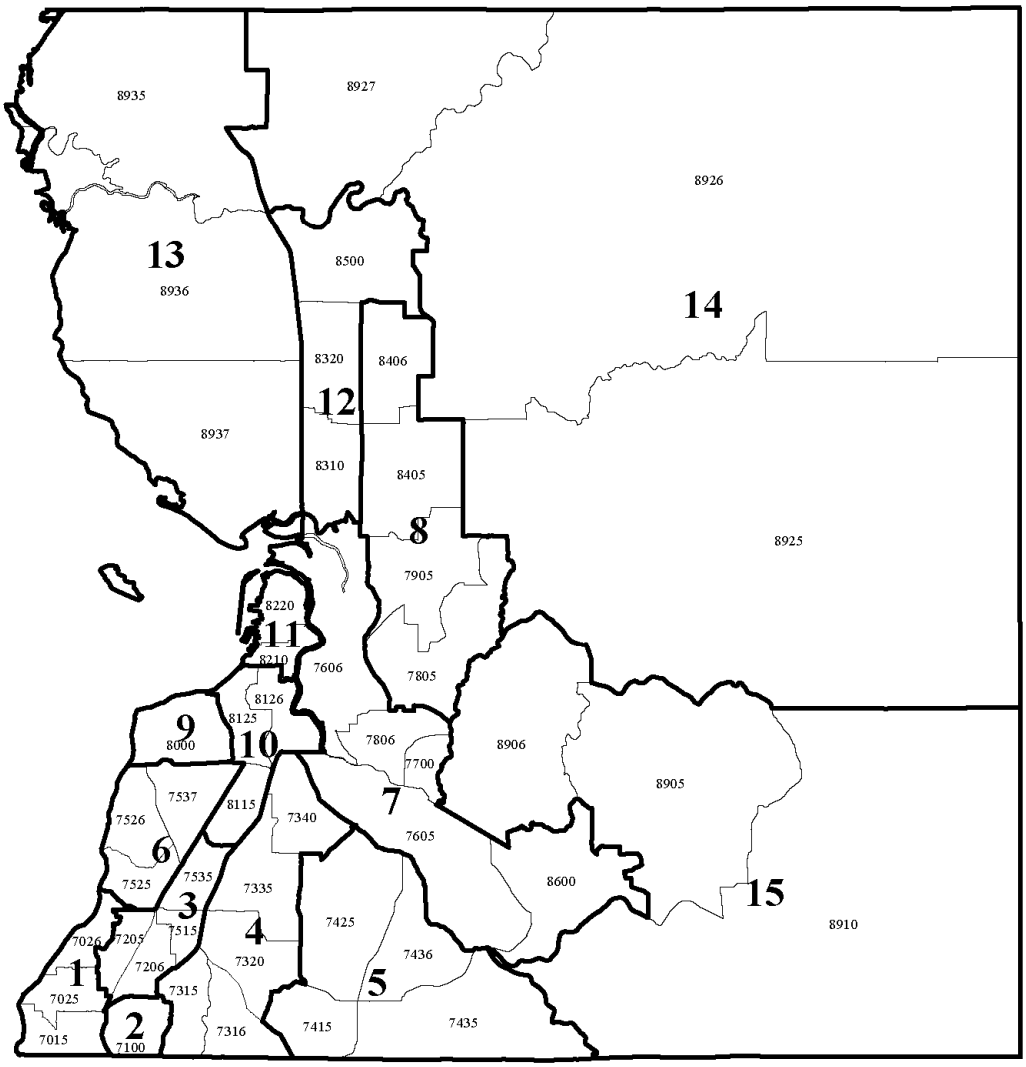
Note:
Large numbers and bold lines are FAZ Groups, and small numbers are FAZs.

WilburSmith ASSOCIATES

Pierce County, WA, FAZ Groups and FAZs

FIGURE A-3

Snohomish County FAZ Groups



1. Edmonds/Esperance
2. Mountlake Terrace
3. Lynnwood Area
4. Mill Creek
5. Clearview/Cathcart/Maltby
6. Paine Field Area
7. Snohomish/Monroe
8. Lake Stevens Area
9. Mukilteo/SW Everett
10. Everett South
11. Everett Central
12. Marysville/Arlington
13. NW Snohomish
14. NE Snohomish
15. SE Snohomish

Source: Puget Sound Regional Council, 12/98

Note:
Large numbers and bold lines are FAZ Groups, and small numbers are FAZs.

APPENDIX B:

ESTIMATED AVERAGE TOLL RATES

Description of Appendix B Tables

The following 36 tables present the estimated average toll rates for all permitted movements on the I-405 express toll lanes. The estimated average toll rates are shown for years 2010, 2014, 2020, and 2030 for the nine modeling time periods (AM 0, AM 1, AM 2, AM 3, MD 1, PM 1, PM 2, PM 3, and PM 4). These modeling time periods are defined below. Actual tolls will vary from the estimated average toll within each time period as traffic demand fluctuates.

Each table shows the southbound and northbound movements. The movements are defined by the express toll lane ingress ramp, and the express toll lane egress ramp. These are the ramps vehicles will use to move between the GP lanes and the express toll lanes. The express toll lane ingress and egress ramps are named by their milepost (MP) number on I-405. These locations are shown in Figure B-1. The express toll lane ingress and egress ramps are shown as red arrows and their names (i.e. milepost numbers) are shown in boxes close to the red arrow. For example, a southbound trip on the express toll lanes from I-5 south to SR 520 would use express toll lane ingress ramp 29.0 and express toll lane egress ramp 16.0.

Modeling Time Periods

1. AM 0: 5:00 to 5:30 a.m.;
2. AM 1: 5:30 to 6:30 a.m.;
3. AM 2: 6:30 to 8:30 a.m.;
4. AM 3: 8:30 to 9:30 a.m.;
5. MD 1: 9:30 a.m. to 2:30 p.m.;
6. PM 1: 2:30 to 3:30 p.m.;
7. PM 2: 3:30 to 5:30 p.m.;
8. PM 3: 5:30 to 6:30 p.m.; and
9. PM 4: 6:30 to 7:00 p.m.

Figure B-1
I-405 Express Toll Lanes
Ingress and Egress Locations Between Express Toll Lanes and General Purpose (GP) Lanes

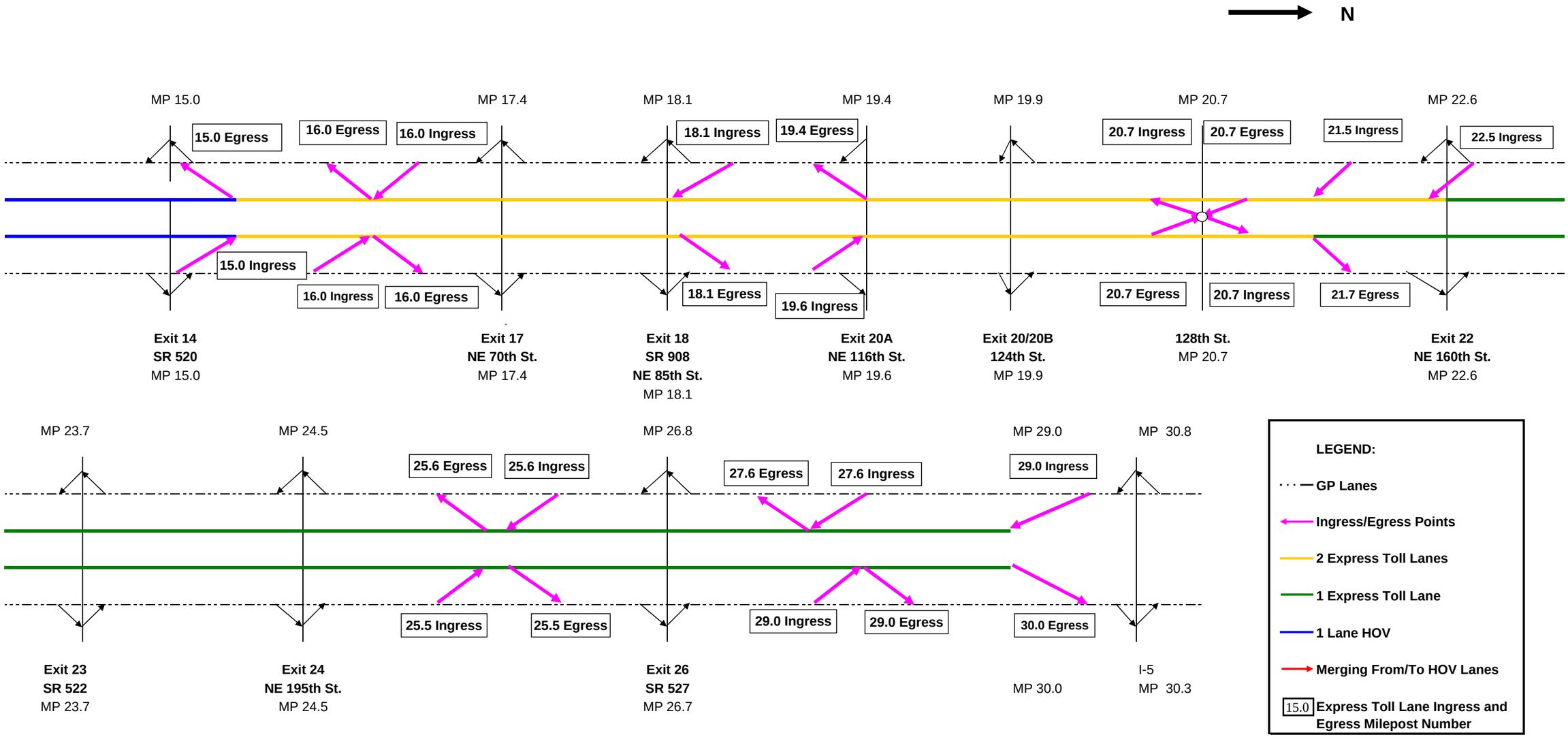


Table B-1

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2010 - AMO (5:00 - 5:30 AM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.50	0.50	0.50	0.55	0.75	0.75
27.6	- -	0.50	0.50	0.55	0.75	0.75
25.6	- -	- -	0.50	0.55	0.75	0.75
22.5	- -	- -	0.50	0.50	0.50	0.50
21.5	- -	- -	0.50	0.50	0.50	0.50
20.7	- -	- -	- -	0.50	0.50	0.50
18.1	- -	- -	- -	- -	0.50	0.50
16.0	- -	- -	- -	- -	- -	0.50

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.50	0.50	0.50	0.50	0.75	0.75	0.75
16.0	- -	0.50	0.50	0.50	0.75	0.75	0.75
19.6	- -	- -	0.50	0.50	0.55	0.55	0.55
20.7	- -	- -	- -	0.50	0.50	0.50	0.50
25.5	- -	- -	- -	- -	- -	0.50	0.50
29.0	- -	- -	- -	- -	- -	- -	0.50

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.46	0.46	0.46	0.51	0.70	0.70
27.6	- -	0.46	0.46	0.51	0.70	0.70
25.6	- -	- -	0.46	0.51	0.70	0.70
22.5	- -	- -	0.46	0.46	0.46	0.46
21.5	- -	- -	0.46	0.46	0.46	0.46
20.7	- -	- -	- -	0.46	0.46	0.46
18.1	- -	- -	- -	- -	0.46	0.46
16.0	- -	- -	- -	- -	- -	0.46

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.46	0.46	0.46	0.46	0.70	0.70	0.70
16.0	- -	0.46	0.46	0.46	0.70	0.70	0.70
19.6	- -	- -	0.46	0.46	0.51	0.51	0.51
20.7	- -	- -	- -	0.46	0.46	0.46	0.46
25.5	- -	- -	- -	- -	- -	0.46	0.46
29.0	- -	- -	- -	- -	- -	- -	0.46

(1) The rates shown in this table reflect 2010 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $0.50 (current Dollars in 2010).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-2

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2010 - AM1 (5:30 - 6:30 AM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.50	0.50	0.50	0.55	0.75	0.75
27.6	- -	0.50	0.50	0.55	0.75	0.75
25.6	- -	- -	0.50	0.55	0.75	0.75
22.5	- -	- -	0.50	0.50	0.50	0.50
21.5	- -	- -	0.50	0.50	0.50	0.50
20.7	- -	- -	- -	0.50	0.50	0.50
18.1	- -	- -	- -	- -	0.50	0.50
16.0	- -	- -	- -	- -	- -	0.50

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.50	0.50	0.50	0.50	0.75	0.75	0.75
16.0	- -	0.50	0.50	0.50	0.75	0.75	0.75
19.6	- -	- -	0.50	0.50	0.55	0.55	0.55
20.7	- -	- -	- -	0.50	0.50	0.50	0.50
25.5	- -	- -	- -	- -	- -	0.50	0.50
29.0	- -	- -	- -	- -	- -	- -	0.50

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.46	0.46	0.46	0.51	0.70	0.70
27.6	- -	0.46	0.46	0.51	0.70	0.70
25.6	- -	- -	0.46	0.51	0.70	0.70
22.5	- -	- -	0.46	0.46	0.46	0.46
21.5	- -	- -	0.46	0.46	0.46	0.46
20.7	- -	- -	- -	0.46	0.46	0.46
18.1	- -	- -	- -	- -	0.46	0.46
16.0	- -	- -	- -	- -	- -	0.46

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.46	0.46	0.46	0.46	0.70	0.70	0.70
16.0	- -	0.46	0.46	0.46	0.70	0.70	0.70
19.6	- -	- -	0.46	0.46	0.51	0.51	0.51
20.7	- -	- -	- -	0.46	0.46	0.46	0.46
25.5	- -	- -	- -	- -	- -	0.46	0.46
29.0	- -	- -	- -	- -	- -	- -	0.46

(1) The rates shown in this table reflect 2010 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $0.50 (current Dollars in 2010).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-3

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2010 - AM2 (6:30 - 8:30 AM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	9.40	9.40	9.40	11.85	12.05	12.05
27.6	- -	9.40	9.40	11.85	12.05	12.05
25.6	- -	- -	9.40	11.85	12.05	12.05
22.5	- -	- -	11.90	4.95	5.15	5.15
21.5	- -	- -	11.90	4.95	5.15	5.15
20.7	- -	- -	- -	4.95	5.15	5.15
18.1	- -	- -	- -	- -	0.50	0.50
16.0	- -	- -	- -	- -	- -	0.50

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	8.73	8.73	8.73	11.00	11.19	11.19
27.6	- -	8.73	8.73	11.00	11.19	11.19
25.6	- -	- -	8.73	11.00	11.19	11.19
22.5	- -	- -	11.05	4.60	4.78	4.78
21.5	- -	- -	11.05	4.60	4.78	4.78
20.7	- -	- -	- -	4.60	4.78	4.78
18.1	- -	- -	- -	- -	0.46	0.46
16.0	- -	- -	- -	- -	- -	0.46

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.50	0.50	0.50	0.50	0.75	0.75	0.75
16.0	- -	0.50	0.50	0.50	0.75	0.75	0.75
19.6	- -	- -	0.50	0.50	0.55	0.55	0.55
20.7	- -	- -	- -	0.50	0.50	0.50	0.50
25.5	- -	- -	- -	- -	- -	0.50	0.50
29.0	- -	- -	- -	- -	- -	- -	0.50

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.46	0.46	0.46	0.46	0.70	0.70	0.70
16.0	- -	0.46	0.46	0.46	0.70	0.70	0.70
19.6	- -	- -	0.46	0.46	0.51	0.51	0.51
20.7	- -	- -	- -	0.46	0.46	0.46	0.46
25.5	- -	- -	- -	- -	- -	0.46	0.46
29.0	- -	- -	- -	- -	- -	- -	0.46

(1) The rates shown in this table reflect 2010 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $0.50 (current Dollars in 2010).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-4

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2010 - AM3 (8:30 - 9:30 AM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	1.90	1.90	1.90	2.60	2.80	2.80
27.6	- -	1.90	1.90	2.60	2.80	2.80
25.6	- -	- -	1.90	2.60	2.80	2.80
22.5	- -	- -	2.90	1.70	1.90	1.90
21.5	- -	- -	2.90	1.70	1.90	1.90
20.7	- -	- -	- -	1.70	1.90	1.90
18.1	- -	- -	- -	- -	0.50	0.50
16.0	- -	- -	- -	- -	- -	0.50

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	1.76	1.76	1.76	2.41	2.60	2.60
27.6	- -	1.76	1.76	2.41	2.60	2.60
25.6	- -	- -	1.76	2.41	2.60	2.60
22.5	- -	- -	2.69	1.58	1.76	1.76
21.5	- -	- -	2.69	1.58	1.76	1.76
20.7	- -	- -	- -	1.58	1.76	1.76
18.1	- -	- -	- -	- -	0.46	0.46
16.0	- -	- -	- -	- -	- -	0.46

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.50	0.50	0.50	0.50	0.75	0.75	0.75
16.0	- -	0.50	0.50	0.50	0.75	0.75	0.75
19.6	- -	- -	0.50	0.50	0.55	0.55	0.55
20.7	- -	- -	- -	0.50	0.50	0.50	0.50
25.5	- -	- -	- -	- -	- -	0.50	0.50
29.0	- -	- -	- -	- -	- -	- -	0.50

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.46	0.46	0.46	0.46	0.70	0.70	0.70
16.0	- -	0.46	0.46	0.46	0.70	0.70	0.70
19.6	- -	- -	0.46	0.46	0.51	0.51	0.51
20.7	- -	- -	- -	0.46	0.46	0.46	0.46
25.5	- -	- -	- -	- -	- -	0.46	0.46
29.0	- -	- -	- -	- -	- -	- -	0.46

(1) The rates shown in this table reflect 2010 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $0.50 (current Dollars in 2010).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-5

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2010 - MD1 (9:30 AM - 2:30 PM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.50	0.50	0.50	0.55	0.75	0.75
27.6	- -	0.50	0.50	0.55	0.75	0.75
25.6	- -	- -	0.50	0.55	0.75	0.75
22.5	- -	- -	0.50	0.50	0.50	0.50
21.5	- -	- -	0.50	0.50	0.50	0.50
20.7	- -	- -	- -	0.50	0.50	0.50
18.1	- -	- -	- -	- -	0.50	0.50
16.0	- -	- -	- -	- -	- -	0.50

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.50	0.50	0.50	0.50	0.75	0.75	0.75
16.0	- -	0.50	0.50	0.50	0.75	0.75	0.75
19.6	- -	- -	0.50	0.50	0.55	0.55	0.55
20.7	- -	- -	- -	0.50	0.50	0.50	0.50
25.5	- -	- -	- -	- -	- -	0.50	0.50
29.0	- -	- -	- -	- -	- -	- -	0.50

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.46	0.46	0.46	0.51	0.70	0.70
27.6	- -	0.46	0.46	0.51	0.70	0.70
25.6	- -	- -	0.46	0.51	0.70	0.70
22.5	- -	- -	0.46	0.46	0.46	0.46
21.5	- -	- -	0.46	0.46	0.46	0.46
20.7	- -	- -	- -	0.46	0.46	0.46
18.1	- -	- -	- -	- -	0.46	0.46
16.0	- -	- -	- -	- -	- -	0.46

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.46	0.46	0.46	0.46	0.70	0.70	0.70
16.0	- -	0.46	0.46	0.46	0.70	0.70	0.70
19.6	- -	- -	0.46	0.46	0.51	0.51	0.51
20.7	- -	- -	- -	0.46	0.46	0.46	0.46
25.5	- -	- -	- -	- -	- -	0.46	0.46
29.0	- -	- -	- -	- -	- -	- -	0.46

(1) The rates shown in this table reflect 2010 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $0.50 (current Dollars in 2010).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-6

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2010 - PM1 (2:30 - 3:30 PM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.50	0.50	0.50	0.55	0.75	0.75
27.6	- -	0.50	0.50	0.55	0.75	0.75
25.6	- -	- -	0.50	0.55	0.75	0.75
22.5	- -	- -	0.50	0.50	0.50	0.50
21.5	- -	- -	0.50	0.50	0.50	0.50
20.7	- -	- -	- -	0.50	0.50	0.50
18.1	- -	- -	- -	- -	0.50	0.50
16.0	- -	- -	- -	- -	- -	0.50

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.80	0.80	1.65	1.65	2.30	2.30	2.30
16.0	- -	0.80	1.65	1.65	2.30	2.30	2.30
19.6	- -	- -	0.85	0.85	1.50	1.50	1.50
20.7	- -	- -	- -	1.15	0.90	0.90	0.90
25.5	- -	- -	- -	- -	- -	0.90	0.90
29.0	- -	- -	- -	- -	- -	- -	0.90

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.46	0.46	0.46	0.51	0.70	0.70
27.6	- -	0.46	0.46	0.51	0.70	0.70
25.6	- -	- -	0.46	0.51	0.70	0.70
22.5	- -	- -	0.46	0.46	0.46	0.46
21.5	- -	- -	0.46	0.46	0.46	0.46
20.7	- -	- -	- -	0.46	0.46	0.46
18.1	- -	- -	- -	- -	0.46	0.46
16.0	- -	- -	- -	- -	- -	0.46

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.74	0.74	1.53	1.53	2.14	2.14	2.14
16.0	- -	0.74	1.53	1.53	2.14	2.14	2.14
19.6	- -	- -	0.79	0.79	1.39	1.39	1.39
20.7	- -	- -	- -	1.07	0.84	0.84	0.84
25.5	- -	- -	- -	- -	- -	0.84	0.84
29.0	- -	- -	- -	- -	- -	- -	0.84

(1) The rates shown in this table reflect 2010 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $0.50 (current Dollars in 2010).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-7

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2010 - PM2 (3:30 - 5:30 PM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.50	0.50	0.50	0.55	0.75	0.75
27.6	- -	0.50	0.50	0.55	0.75	0.75
25.6	- -	- -	0.50	0.55	0.75	0.75
22.5	- -	- -	0.50	0.50	0.50	0.50
21.5	- -	- -	0.50	0.50	0.50	0.50
20.7	- -	- -	- -	0.50	0.50	0.50
18.1	- -	- -	- -	- -	0.50	0.50
16.0	- -	- -	- -	- -	- -	0.50

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.50	0.50	3.85	3.85	6.15	6.15	6.15
16.0	- -	0.50	3.85	3.85	6.15	6.15	6.15
19.6	- -	- -	3.50	3.50	5.75	5.75	5.75
20.7	- -	- -	- -	8.30	5.30	5.30	5.30
25.5	- -	- -	- -	- -	- -	5.30	5.30
29.0	- -	- -	- -	- -	- -	- -	5.30

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.46	0.46	0.46	0.51	0.70	0.70
27.6	- -	0.46	0.46	0.51	0.70	0.70
25.6	- -	- -	0.46	0.51	0.70	0.70
22.5	- -	- -	0.46	0.46	0.46	0.46
21.5	- -	- -	0.46	0.46	0.46	0.46
20.7	- -	- -	- -	0.46	0.46	0.46
18.1	- -	- -	- -	- -	0.46	0.46
16.0	- -	- -	- -	- -	- -	0.46

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.46	0.46	3.58	3.58	5.71	5.71	5.71
16.0	- -	0.46	3.58	3.58	5.71	5.71	5.71
19.6	- -	- -	3.25	3.25	5.34	5.34	5.34
20.7	- -	- -	- -	7.71	4.92	4.92	4.92
25.5	- -	- -	- -	- -	- -	4.92	4.92
29.0	- -	- -	- -	- -	- -	- -	4.92

(1) The rates shown in this table reflect 2010 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $0.50 (current Dollars in 2010).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-8

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2010 - PM3 (5:30 - 6:30 PM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.75	0.75	0.75	0.90	1.10	1.10
27.6	- -	0.75	0.75	0.90	1.10	1.10
25.6	- -	- -	0.75	0.90	1.10	1.10
22.5	- -	- -	0.75	0.50	0.50	0.50
21.5	- -	- -	0.75	0.50	0.50	0.50
20.7	- -	- -	- -	0.50	0.50	0.50
18.1	- -	- -	- -	- -	0.50	0.50
16.0	- -	- -	- -	- -	- -	0.50

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.50	0.50	4.50	4.50	6.45	6.45	6.45
16.0	- -	0.50	4.50	4.50	6.45	6.45	6.45
19.6	- -	- -	4.50	4.50	6.25	6.25	6.25
20.7	- -	- -	- -	10.15	6.15	6.15	6.15
25.5	- -	- -	- -	- -	- -	6.15	6.15
29.0	- -	- -	- -	- -	- -	- -	6.15

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.70	0.70	0.70	0.84	1.02	1.02
27.6	- -	0.70	0.70	0.84	1.02	1.02
25.6	- -	- -	0.70	0.84	1.02	1.02
22.5	- -	- -	0.70	0.46	0.46	0.46
21.5	- -	- -	0.70	0.46	0.46	0.46
20.7	- -	- -	- -	0.46	0.46	0.46
18.1	- -	- -	- -	- -	0.46	0.46
16.0	- -	- -	- -	- -	- -	0.46

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.46	0.46	4.18	4.18	5.99	5.99	5.99
16.0	- -	0.46	4.18	4.18	5.99	5.99	5.99
19.6	- -	- -	4.18	4.18	5.80	5.80	5.80
20.7	- -	- -	- -	9.43	5.71	5.71	5.71
25.5	- -	- -	- -	- -	- -	5.71	5.71
29.0	- -	- -	- -	- -	- -	- -	5.71

(1) The rates shown in this table reflect 2010 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $0.50 (current Dollars in 2010).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-9

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2010 - PM4 (6:30 - 7:00 PM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.50	0.50	0.50	0.55	0.75	0.75
27.6	- -	0.50	0.50	0.55	0.75	0.75
25.6	- -	- -	0.50	0.55	0.75	0.75
22.5	- -	- -	0.50	0.50	0.50	0.50
21.5	- -	- -	0.50	0.50	0.50	0.50
20.7	- -	- -	- -	0.50	0.50	0.50
18.1	- -	- -	- -	- -	0.50	0.50
16.0	- -	- -	- -	- -	- -	0.50

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.50	0.50	2.00	2.00	2.05	2.05	2.05
16.0	- -	0.50	2.00	2.00	2.05	2.05	2.05
19.6	- -	- -	2.00	2.00	1.85	1.85	1.85
20.7	- -	- -	- -	3.25	1.75	1.75	1.75
25.5	- -	- -	- -	- -	- -	1.75	1.75
29.0	- -	- -	- -	- -	- -	- -	1.75

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.46	0.46	0.46	0.51	0.70	0.70
27.6	- -	0.46	0.46	0.51	0.70	0.70
25.6	- -	- -	0.46	0.51	0.70	0.70
22.5	- -	- -	0.46	0.46	0.46	0.46
21.5	- -	- -	0.46	0.46	0.46	0.46
20.7	- -	- -	- -	0.46	0.46	0.46
18.1	- -	- -	- -	- -	0.46	0.46
16.0	- -	- -	- -	- -	- -	0.46

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.46	0.46	1.86	1.86	1.90	1.90	1.90
16.0	- -	0.46	1.86	1.86	1.90	1.90	1.90
19.6	- -	- -	1.86	1.86	1.72	1.72	1.72
20.7	- -	- -	- -	3.02	1.63	1.63	1.63
25.5	- -	- -	- -	- -	- -	1.63	1.63
29.0	- -	- -	- -	- -	- -	- -	1.63

(1) The rates shown in this table reflect 2010 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $0.50 (current Dollars in 2010).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-10

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2014 - AMO (5:00 - 5:30 AM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.60	0.60	0.60	0.60	0.75	0.75
27.6	- -	0.60	0.60	0.60	0.75	0.75
25.6	- -	- -	0.60	0.60	0.75	0.75
22.5	- -	- -	0.60	0.60	0.60	0.60
21.5	- -	- -	0.60	0.60	0.60	0.60
20.7	- -	- -	- -	0.60	0.60	0.60
18.1	- -	- -	- -	- -	0.60	0.60
16.0	- -	- -	- -	- -	- -	0.60

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.50	0.50	0.50	0.50	0.63	0.63
27.6	- -	0.50	0.50	0.50	0.63	0.63
25.6	- -	- -	0.50	0.50	0.63	0.63
22.5	- -	- -	0.50	0.50	0.50	0.50
21.5	- -	- -	0.50	0.50	0.50	0.50
20.7	- -	- -	- -	0.50	0.50	0.50
18.1	- -	- -	- -	- -	0.50	0.50
16.0	- -	- -	- -	- -	- -	0.50

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.60	0.60	0.60	0.60	0.75	0.75	0.75
16.0	- -	0.60	0.60	0.60	0.75	0.75	0.75
19.6	- -	- -	0.60	0.60	0.60	0.60	0.60
20.7	- -	- -	- -	0.60	0.60	0.60	0.60
25.5	- -	- -	- -	- -	- -	0.60	0.60
29.0	- -	- -	- -	- -	- -	- -	0.60

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.50	0.50	0.50	0.50	0.63	0.63	0.63
16.0	- -	0.50	0.50	0.50	0.63	0.63	0.63
19.6	- -	- -	0.50	0.50	0.50	0.50	0.50
20.7	- -	- -	- -	0.50	0.50	0.50	0.50
25.5	- -	- -	- -	- -	- -	0.50	0.50
29.0	- -	- -	- -	- -	- -	- -	0.50

(1) The rates shown in this table reflect 2014 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $0.60 (current Dollars in 2014).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-11

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2014 - AM1 (5:30 - 6:30 AM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.60	0.60	0.60	0.60	0.75	0.75
27.6	- -	0.60	0.60	0.60	0.75	0.75
25.6	- -	- -	0.60	0.60	0.75	0.75
22.5	- -	- -	0.60	0.60	0.60	0.60
21.5	- -	- -	0.60	0.60	0.60	0.60
20.7	- -	- -	- -	0.60	0.60	0.60
18.1	- -	- -	- -	- -	0.60	0.60
16.0	- -	- -	- -	- -	- -	0.60

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.50	0.50	0.50	0.50	0.63	0.63
27.6	- -	0.50	0.50	0.50	0.63	0.63
25.6	- -	- -	0.50	0.50	0.63	0.63
22.5	- -	- -	0.50	0.50	0.50	0.50
21.5	- -	- -	0.50	0.50	0.50	0.50
20.7	- -	- -	- -	0.50	0.50	0.50
18.1	- -	- -	- -	- -	0.50	0.50
16.0	- -	- -	- -	- -	- -	0.50

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.60	0.60	0.60	0.60	0.75	0.75	0.75
16.0	- -	0.60	0.60	0.60	0.75	0.75	0.75
19.6	- -	- -	0.60	0.60	0.60	0.60	0.60
20.7	- -	- -	- -	0.60	0.60	0.60	0.60
25.5	- -	- -	- -	- -	- -	0.60	0.60
29.0	- -	- -	- -	- -	- -	- -	0.60

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.50	0.50	0.50	0.50	0.63	0.63	0.63
16.0	- -	0.50	0.50	0.50	0.63	0.63	0.63
19.6	- -	- -	0.50	0.50	0.50	0.50	0.50
20.7	- -	- -	- -	0.50	0.50	0.50	0.50
25.5	- -	- -	- -	- -	- -	0.50	0.50
29.0	- -	- -	- -	- -	- -	- -	0.50

(1) The rates shown in this table reflect 2014 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $0.60 (current Dollars in 2014).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-12

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2014 - AM2 (6:30 - 8:30 AM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	9.75	9.75	9.75	12.20	12.40	12.40
27.6	- -	9.75	9.75	12.20	12.40	12.40
25.6	- -	- -	9.75	12.20	12.40	12.40
22.5	- -	- -	12.75	5.45	5.65	5.65
21.5	- -	- -	12.75	5.45	5.65	5.65
20.7	- -	- -	- -	5.45	5.65	5.65
18.1	- -	- -	- -	- -	0.60	0.60
16.0	- -	- -	- -	- -	- -	0.60

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	8.20	8.20	8.20	10.26	10.43	10.43
27.6	- -	8.20	8.20	10.26	10.43	10.43
25.6	- -	- -	8.20	10.26	10.43	10.43
22.5	- -	- -	10.73	4.58	4.75	4.75
21.5	- -	- -	10.73	4.58	4.75	4.75
20.7	- -	- -	- -	4.58	4.75	4.75
18.1	- -	- -	- -	- -	0.50	0.50
16.0	- -	- -	- -	- -	- -	0.50

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.60	0.60	0.60	0.60	0.75	0.75	0.75
16.0	- -	0.60	0.60	0.60	0.75	0.75	0.75
19.6	- -	- -	0.60	0.60	0.60	0.60	0.60
20.7	- -	- -	- -	0.60	0.60	0.60	0.60
25.5	- -	- -	- -	- -	- -	0.60	0.60
29.0	- -	- -	- -	- -	- -	- -	0.60

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.50	0.50	0.50	0.50	0.63	0.63	0.63
16.0	- -	0.50	0.50	0.50	0.63	0.63	0.63
19.6	- -	- -	0.50	0.50	0.50	0.50	0.50
20.7	- -	- -	- -	0.50	0.50	0.50	0.50
25.5	- -	- -	- -	- -	- -	0.50	0.50
29.0	- -	- -	- -	- -	- -	- -	0.50

(1) The rates shown in this table reflect 2014 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $0.60 (current Dollars in 2014).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-13

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2014 - AM3 (8:30 - 9:30 AM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	3.00	3.00	3.00	4.20	4.40	4.40
27.6	- -	3.00	3.00	4.20	4.40	4.40
25.6	- -	- -	3.00	4.20	4.40	4.40
22.5	- -	- -	4.50	2.70	2.90	2.90
21.5	- -	- -	4.50	2.70	2.90	2.90
20.7	- -	- -	- -	2.70	2.90	2.90
18.1	- -	- -	- -	- -	0.60	0.60
16.0	- -	- -	- -	- -	- -	0.60

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	2.52	2.52	2.52	3.53	3.70	3.70
27.6	- -	2.52	2.52	3.53	3.70	3.70
25.6	- -	- -	2.52	3.53	3.70	3.70
22.5	- -	- -	3.79	2.27	2.44	2.44
21.5	- -	- -	3.79	2.27	2.44	2.44
20.7	- -	- -	- -	2.27	2.44	2.44
18.1	- -	- -	- -	- -	0.50	0.50
16.0	- -	- -	- -	- -	- -	0.50

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.60	0.60	0.60	0.60	0.75	0.75	0.75
16.0	- -	0.60	0.60	0.60	0.75	0.75	0.75
19.6	- -	- -	0.60	0.60	0.60	0.60	0.60
20.7	- -	- -	- -	0.60	0.60	0.60	0.60
25.5	- -	- -	- -	- -	- -	0.60	0.60
29.0	- -	- -	- -	- -	- -	- -	0.60

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.50	0.50	0.50	0.50	0.63	0.63	0.63
16.0	- -	0.50	0.50	0.50	0.63	0.63	0.63
19.6	- -	- -	0.50	0.50	0.50	0.50	0.50
20.7	- -	- -	- -	0.50	0.50	0.50	0.50
25.5	- -	- -	- -	- -	- -	0.50	0.50
29.0	- -	- -	- -	- -	- -	- -	0.50

(1) The rates shown in this table reflect 2014 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $0.60 (current Dollars in 2014).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-14

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2014 - MD1 (9:30 AM - 2:30 PM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.60	0.60	0.60	0.60	0.75	0.75
27.6	- -	0.60	0.60	0.60	0.75	0.75
25.6	- -	- -	0.60	0.60	0.75	0.75
22.5	- -	- -	0.60	0.60	0.60	0.60
21.5	- -	- -	0.60	0.60	0.60	0.60
20.7	- -	- -	- -	0.60	0.60	0.60
18.1	- -	- -	- -	- -	0.60	0.60
16.0	- -	- -	- -	- -	- -	0.60

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.50	0.50	0.50	0.50	0.63	0.63
27.6	- -	0.50	0.50	0.50	0.63	0.63
25.6	- -	- -	0.50	0.50	0.63	0.63
22.5	- -	- -	0.50	0.50	0.50	0.50
21.5	- -	- -	0.50	0.50	0.50	0.50
20.7	- -	- -	- -	0.50	0.50	0.50
18.1	- -	- -	- -	- -	0.50	0.50
16.0	- -	- -	- -	- -	- -	0.50

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.60	0.60	0.60	0.60	0.75	0.75	0.75
16.0	- -	0.60	0.60	0.60	0.75	0.75	0.75
19.6	- -	- -	0.60	0.60	0.60	0.60	0.60
20.7	- -	- -	- -	0.60	0.60	0.60	0.60
25.5	- -	- -	- -	- -	- -	0.60	0.60
29.0	- -	- -	- -	- -	- -	- -	0.60

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.50	0.50	0.50	0.50	0.63	0.63	0.63
16.0	- -	0.50	0.50	0.50	0.63	0.63	0.63
19.6	- -	- -	0.50	0.50	0.50	0.50	0.50
20.7	- -	- -	- -	0.50	0.50	0.50	0.50
25.5	- -	- -	- -	- -	- -	0.50	0.50
29.0	- -	- -	- -	- -	- -	- -	0.50

(1) The rates shown in this table reflect 2014 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $0.60 (current Dollars in 2014).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-15

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2014 - PM1 (2:30 - 3:30 PM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.60	0.60	0.60	0.60	0.75	0.75
27.6	- -	0.60	0.60	0.60	0.75	0.75
25.6	- -	- -	0.60	0.60	0.75	0.75
22.5	- -	- -	0.60	0.60	0.60	0.60
21.5	- -	- -	0.60	0.60	0.60	0.60
20.7	- -	- -	- -	0.60	0.60	0.60
18.1	- -	- -	- -	- -	0.60	0.60
16.0	- -	- -	- -	- -	- -	0.60

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	1.15	1.15	2.80	2.80	3.35	3.35	3.35
16.0	- -	1.15	2.80	2.80	3.35	3.35	3.35
19.6	- -	- -	1.65	1.65	2.20	2.20	2.20
20.7	- -	- -	- -	2.05	1.30	1.30	1.30
25.5	- -	- -	- -	- -	- -	1.30	1.30
29.0	- -	- -	- -	- -	- -	- -	1.30

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.50	0.50	0.50	0.50	0.63	0.63
27.6	- -	0.50	0.50	0.50	0.63	0.63
25.6	- -	- -	0.50	0.50	0.63	0.63
22.5	- -	- -	0.50	0.50	0.50	0.50
21.5	- -	- -	0.50	0.50	0.50	0.50
20.7	- -	- -	- -	0.50	0.50	0.50
18.1	- -	- -	- -	- -	0.50	0.50
16.0	- -	- -	- -	- -	- -	0.50

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.97	0.97	2.36	2.36	2.82	2.82	2.82
16.0	- -	0.97	2.36	2.36	2.82	2.82	2.82
19.6	- -	- -	1.39	1.39	1.85	1.85	1.85
20.7	- -	- -	- -	1.72	1.09	1.09	1.09
25.5	- -	- -	- -	- -	- -	1.09	1.09
29.0	- -	- -	- -	- -	- -	- -	1.09

(1) The rates shown in this table reflect 2014 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $0.60 (current Dollars in 2014).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-16

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2014 - PM2 (3:30 - 5:30 PM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.60	0.60	0.60	0.60	0.75	0.75
27.6	- -	0.60	0.60	0.60	0.75	0.75
25.6	- -	- -	0.60	0.60	0.75	0.75
22.5	- -	- -	0.60	0.60	0.60	0.60
21.5	- -	- -	0.60	0.60	0.60	0.60
20.7	- -	- -	- -	0.60	0.60	0.60
18.1	- -	- -	- -	- -	0.60	0.60
16.0	- -	- -	- -	- -	- -	0.60

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	1.55	1.55	6.90	6.90	10.65	10.65	10.65
16.0	- -	1.55	6.90	6.90	10.65	10.65	10.65
19.6	- -	- -	5.35	5.35	9.10	9.10	9.10
20.7	- -	- -	- -	11.25	7.50	7.50	7.50
25.5	- -	- -	- -	- -	- -	7.50	7.50
29.0	- -	- -	- -	- -	- -	- -	7.50

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.50	0.50	0.50	0.50	0.63	0.63
27.6	- -	0.50	0.50	0.50	0.63	0.63
25.6	- -	- -	0.50	0.50	0.63	0.63
22.5	- -	- -	0.50	0.50	0.50	0.50
21.5	- -	- -	0.50	0.50	0.50	0.50
20.7	- -	- -	- -	0.50	0.50	0.50
18.1	- -	- -	- -	- -	0.50	0.50
16.0	- -	- -	- -	- -	- -	0.50

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	1.30	1.30	5.80	5.80	8.96	8.96	8.96
16.0	- -	1.30	5.80	5.80	8.96	8.96	8.96
19.6	- -	- -	4.50	4.50	7.66	7.66	7.66
20.7	- -	- -	- -	9.46	6.31	6.31	6.31
25.5	- -	- -	- -	- -	- -	6.31	6.31
29.0	- -	- -	- -	- -	- -	- -	6.31

(1) The rates shown in this table reflect 2014 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $0.60 (current Dollars in 2014).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-17

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2014 - PM3 (5:30 - 6:30 PM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	1.90	1.90	1.90	2.05	2.25	2.25
27.6	- -	1.90	1.90	2.05	2.25	2.25
25.6	- -	- -	1.90	2.05	2.25	2.25
22.5	- -	- -	1.90	0.60	0.60	0.60
21.5	- -	- -	1.90	0.60	0.60	0.60
20.7	- -	- -	- -	0.60	0.60	0.60
18.1	- -	- -	- -	- -	0.60	0.60
16.0	- -	- -	- -	- -	- -	0.60

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	1.60	1.60	1.60	1.72	1.89	1.89
27.6	- -	1.60	1.60	1.72	1.89	1.89
25.6	- -	- -	1.60	1.72	1.89	1.89
22.5	- -	- -	1.60	0.50	0.50	0.50
21.5	- -	- -	1.60	0.50	0.50	0.50
20.7	- -	- -	- -	0.50	0.50	0.50
18.1	- -	- -	- -	- -	0.50	0.50
16.0	- -	- -	- -	- -	- -	0.50

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.60	0.60	5.55	5.55	8.15	8.15	8.15
16.0	- -	0.60	5.55	5.55	8.15	8.15	8.15
19.6	- -	- -	5.15	5.15	7.75	7.75	7.75
20.7	- -	- -	- -	10.60	6.60	6.60	6.60
25.5	- -	- -	- -	- -	- -	6.60	6.60
29.0	- -	- -	- -	- -	- -	- -	6.60

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.50	0.50	4.67	4.67	6.86	6.86	6.86
16.0	- -	0.50	4.67	4.67	6.86	6.86	6.86
19.6	- -	- -	4.33	4.33	6.52	6.52	6.52
20.7	- -	- -	- -	8.92	5.55	5.55	5.55
25.5	- -	- -	- -	- -	- -	5.55	5.55
29.0	- -	- -	- -	- -	- -	- -	5.55

(1) The rates shown in this table reflect 2014 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $0.60 (current Dollars in 2014).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-18

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2014 - PM4 (6:30 - 7:00 PM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.60	0.60	0.60	0.60	0.75	0.75
27.6	- -	0.60	0.60	0.60	0.75	0.75
25.6	- -	- -	0.60	0.60	0.75	0.75
22.5	- -	- -	0.60	0.60	0.60	0.60
21.5	- -	- -	0.60	0.60	0.60	0.60
20.7	- -	- -	- -	0.60	0.60	0.60
18.1	- -	- -	- -	- -	0.60	0.60
16.0	- -	- -	- -	- -	- -	0.60

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.60	0.60	2.10	2.10	3.20	3.20	3.20
16.0	- -	0.60	2.10	2.10	3.20	3.20	3.20
19.6	- -	- -	2.10	2.10	3.00	3.00	3.00
20.7	- -	- -	- -	4.15	2.65	2.65	2.65
25.5	- -	- -	- -	- -	- -	2.65	2.65
29.0	- -	- -	- -	- -	- -	- -	2.65

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.50	0.50	0.50	0.50	0.63	0.63
27.6	- -	0.50	0.50	0.50	0.63	0.63
25.6	- -	- -	0.50	0.50	0.63	0.63
22.5	- -	- -	0.50	0.50	0.50	0.50
21.5	- -	- -	0.50	0.50	0.50	0.50
20.7	- -	- -	- -	0.50	0.50	0.50
18.1	- -	- -	- -	- -	0.50	0.50
16.0	- -	- -	- -	- -	- -	0.50

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.50	0.50	1.77	1.77	2.69	2.69	2.69
16.0	- -	0.50	1.77	1.77	2.69	2.69	2.69
19.6	- -	- -	1.77	1.77	2.52	2.52	2.52
20.7	- -	- -	- -	3.49	2.23	2.23	2.23
25.5	- -	- -	- -	- -	- -	2.23	2.23
29.0	- -	- -	- -	- -	- -	- -	2.23

(1) The rates shown in this table reflect 2014 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $0.60 (current Dollars in 2014).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-19

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2020 - AMO (5:00 - 5:30 AM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.75	0.75	0.75	0.75	0.75	0.75
27.6	- -	0.75	0.75	0.75	0.75	0.75
25.6	- -	- -	0.75	0.75	0.75	0.75
22.5	- -	- -	0.75	0.75	0.75	0.75
21.5	- -	- -	0.75	0.75	0.75	0.75
20.7	- -	- -	- -	0.75	0.75	0.75
18.1	- -	- -	- -	- -	0.75	0.75
16.0	- -	- -	- -	- -	- -	0.75

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.75	0.75	0.75	0.75	0.75	0.75	0.75
16.0	- -	0.75	0.75	0.75	0.75	0.75	0.75
19.6	- -	- -	0.75	0.75	0.75	0.75	0.75
20.7	- -	- -	- -	0.75	0.75	0.75	0.75
25.5	- -	- -	- -	- -	- -	0.75	0.75
29.0	- -	- -	- -	- -	- -	- -	0.75

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.54	0.54	0.54	0.54	0.54	0.54
27.6	- -	0.54	0.54	0.54	0.54	0.54
25.6	- -	- -	0.54	0.54	0.54	0.54
22.5	- -	- -	0.54	0.54	0.54	0.54
21.5	- -	- -	0.54	0.54	0.54	0.54
20.7	- -	- -	- -	0.54	0.54	0.54
18.1	- -	- -	- -	- -	0.54	0.54
16.0	- -	- -	- -	- -	- -	0.54

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.54	0.54	0.54	0.54	0.54	0.54	0.54
16.0	- -	0.54	0.54	0.54	0.54	0.54	0.54
19.6	- -	- -	0.54	0.54	0.54	0.54	0.54
20.7	- -	- -	- -	0.54	0.54	0.54	0.54
25.5	- -	- -	- -	- -	- -	0.54	0.54
29.0	- -	- -	- -	- -	- -	- -	0.54

(1) The rates shown in this table reflect 2020 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $0.75 (current Dollars in 2020).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-20

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2020 - AM1 (5:30 - 6:30 AM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	1.15	1.15	1.15	1.30	1.50	1.50
27.6	- -	1.15	1.15	1.30	1.50	1.50
25.6	- -	- -	1.15	1.30	1.50	1.50
22.5	- -	- -	1.15	0.75	0.75	0.75
21.5	- -	- -	1.15	0.75	0.75	0.75
20.7	- -	- -	- -	0.75	0.75	0.75
18.1	- -	- -	- -	- -	0.75	0.75
16.0	- -	- -	- -	- -	- -	0.75

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.75	0.75	0.75	0.75	0.75	0.75	0.75
16.0	- -	0.75	0.75	0.75	0.75	0.75	0.75
19.6	- -	- -	0.75	0.75	0.75	0.75	0.75
20.7	- -	- -	- -	0.75	0.75	0.75	0.75
25.5	- -	- -	- -	- -	- -	0.75	0.75
29.0	- -	- -	- -	- -	- -	- -	0.75

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.83	0.83	0.83	0.94	1.09	1.09
27.6	- -	0.83	0.83	0.94	1.09	1.09
25.6	- -	- -	0.83	0.94	1.09	1.09
22.5	- -	- -	0.83	0.54	0.54	0.54
21.5	- -	- -	0.83	0.54	0.54	0.54
20.7	- -	- -	- -	0.54	0.54	0.54
18.1	- -	- -	- -	- -	0.54	0.54
16.0	- -	- -	- -	- -	- -	0.54

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.54	0.54	0.54	0.54	0.54	0.54	0.54
16.0	- -	0.54	0.54	0.54	0.54	0.54	0.54
19.6	- -	- -	0.54	0.54	0.54	0.54	0.54
20.7	- -	- -	- -	0.54	0.54	0.54	0.54
25.5	- -	- -	- -	- -	- -	0.54	0.54
29.0	- -	- -	- -	- -	- -	- -	0.54

(1) The rates shown in this table reflect 2020 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $0.75 (current Dollars in 2020).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-21

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2020 - AM2 (6:30 - 8:30 AM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	11.25	11.25	11.25	13.95	14.35	14.35
27.6	- -	11.25	11.25	13.95	14.35	14.35
25.6	- -	- -	11.25	13.95	14.35	14.35
22.5	- -	- -	14.25	5.70	6.10	6.10
21.5	- -	- -	14.25	5.70	6.10	6.10
20.7	- -	- -	- -	5.70	6.10	6.10
18.1	- -	- -	- -	- -	0.75	0.75
16.0	- -	- -	- -	- -	- -	0.75

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.75	0.75	0.75	0.75	0.75	0.75	0.75
16.0	- -	0.75	0.75	0.75	0.75	0.75	0.75
19.6	- -	- -	0.75	0.75	0.75	0.75	0.75
20.7	- -	- -	- -	0.75	0.75	0.75	0.75
25.5	- -	- -	- -	- -	- -	0.75	0.75
29.0	- -	- -	- -	- -	- -	- -	0.75

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	8.16	8.16	8.16	10.12	10.41	10.41
27.6	- -	8.16	8.16	10.12	10.41	10.41
25.6	- -	- -	8.16	10.12	10.41	10.41
22.5	- -	- -	10.34	4.13	4.43	4.43
21.5	- -	- -	10.34	4.13	4.43	4.43
20.7	- -	- -	- -	4.13	4.43	4.43
18.1	- -	- -	- -	- -	0.54	0.54
16.0	- -	- -	- -	- -	- -	0.54

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.54	0.54	0.54	0.54	0.54	0.54	0.54
16.0	- -	0.54	0.54	0.54	0.54	0.54	0.54
19.6	- -	- -	0.54	0.54	0.54	0.54	0.54
20.7	- -	- -	- -	0.54	0.54	0.54	0.54
25.5	- -	- -	- -	- -	- -	0.54	0.54
29.0	- -	- -	- -	- -	- -	- -	0.54

(1) The rates shown in this table reflect 2020 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $0.75 (current Dollars in 2020).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-22

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2020 - AM3 (8:30 - 9:30 AM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	6.00	6.00	6.00	8.05	8.25	8.25
27.6	- -	6.00	6.00	8.05	8.25	8.25
25.6	- -	- -	6.00	8.05	8.25	8.25
22.5	- -	- -	7.50	3.55	3.75	3.75
21.5	- -	- -	7.50	3.55	3.75	3.75
20.7	- -	- -	- -	3.55	3.75	3.75
18.1	- -	- -	- -	- -	0.75	0.75
16.0	- -	- -	- -	- -	- -	0.75

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	4.35	4.35	4.35	5.84	5.98	5.98
27.6	- -	4.35	4.35	5.84	5.98	5.98
25.6	- -	- -	4.35	5.84	5.98	5.98
22.5	- -	- -	5.44	2.58	2.72	2.72
21.5	- -	- -	5.44	2.58	2.72	2.72
20.7	- -	- -	- -	2.58	2.72	2.72
18.1	- -	- -	- -	- -	0.54	0.54
16.0	- -	- -	- -	- -	- -	0.54

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.75	0.75	0.75	0.75	0.75	0.75	0.75
16.0	- -	0.75	0.75	0.75	0.75	0.75	0.75
19.6	- -	- -	0.75	0.75	0.75	0.75	0.75
20.7	- -	- -	- -	0.75	0.75	0.75	0.75
25.5	- -	- -	- -	- -	- -	0.75	0.75
29.0	- -	- -	- -	- -	- -	- -	0.75

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.54	0.54	0.54	0.54	0.54	0.54	0.54
16.0	- -	0.54	0.54	0.54	0.54	0.54	0.54
19.6	- -	- -	0.54	0.54	0.54	0.54	0.54
20.7	- -	- -	- -	0.54	0.54	0.54	0.54
25.5	- -	- -	- -	- -	- -	0.54	0.54
29.0	- -	- -	- -	- -	- -	- -	0.54

(1) The rates shown in this table reflect 2020 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $0.75 (current Dollars in 2020).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-23

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2020 - MD1 (9:30 AM - 2:30 PM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.75	0.75	0.75	0.75	0.75	0.75
27.6	- -	0.75	0.75	0.75	0.75	0.75
25.6	- -	- -	0.75	0.75	0.75	0.75
22.5	- -	- -	0.75	0.75	0.75	0.75
21.5	- -	- -	0.75	0.75	0.75	0.75
20.7	- -	- -	- -	0.75	0.75	0.75
18.1	- -	- -	- -	- -	0.75	0.75
16.0	- -	- -	- -	- -	- -	0.75

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.75	0.75	0.75	0.75	0.75	0.75	0.75
16.0	- -	0.75	0.75	0.75	0.75	0.75	0.75
19.6	- -	- -	0.75	0.75	0.75	0.75	0.75
20.7	- -	- -	- -	0.75	0.75	0.75	0.75
25.5	- -	- -	- -	- -	- -	0.75	0.75
29.0	- -	- -	- -	- -	- -	- -	0.75

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.54	0.54	0.54	0.54	0.54	0.54
27.6	- -	0.54	0.54	0.54	0.54	0.54
25.6	- -	- -	0.54	0.54	0.54	0.54
22.5	- -	- -	0.54	0.54	0.54	0.54
21.5	- -	- -	0.54	0.54	0.54	0.54
20.7	- -	- -	- -	0.54	0.54	0.54
18.1	- -	- -	- -	- -	0.54	0.54
16.0	- -	- -	- -	- -	- -	0.54

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.54	0.54	0.54	0.54	0.54	0.54	0.54
16.0	- -	0.54	0.54	0.54	0.54	0.54	0.54
19.6	- -	- -	0.54	0.54	0.54	0.54	0.54
20.7	- -	- -	- -	0.54	0.54	0.54	0.54
25.5	- -	- -	- -	- -	- -	0.54	0.54
29.0	- -	- -	- -	- -	- -	- -	0.54

(1) The rates shown in this table reflect 2020 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $0.75 (current Dollars in 2020).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-24

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2020 - PM1 (2:30 - 3:30 PM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.75	0.75	0.75	0.75	0.75	0.75
27.6	- -	0.75	0.75	0.75	0.75	0.75
25.6	- -	- -	0.75	0.75	0.75	0.75
22.5	- -	- -	0.75	0.75	0.75	0.75
21.5	- -	- -	0.75	0.75	0.75	0.75
20.7	- -	- -	- -	0.75	0.75	0.75
18.1	- -	- -	- -	- -	0.75	0.75
16.0	- -	- -	- -	- -	- -	0.75

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	1.35	1.35	4.40	4.40	4.15	4.15	4.15
16.0	- -	1.35	4.40	4.40	4.15	4.15	4.15
19.6	- -	- -	3.05	3.05	2.80	2.80	2.80
20.7	- -	- -	- -	3.75	1.75	1.75	1.75
25.5	- -	- -	- -	- -	- -	1.75	1.75
29.0	- -	- -	- -	- -	- -	- -	1.75

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.54	0.54	0.54	0.54	0.54	0.54
27.6	- -	0.54	0.54	0.54	0.54	0.54
25.6	- -	- -	0.54	0.54	0.54	0.54
22.5	- -	- -	0.54	0.54	0.54	0.54
21.5	- -	- -	0.54	0.54	0.54	0.54
20.7	- -	- -	- -	0.54	0.54	0.54
18.1	- -	- -	- -	- -	0.54	0.54
16.0	- -	- -	- -	- -	- -	0.54

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.98	0.98	3.19	3.19	3.01	3.01	3.01
16.0	- -	0.98	3.19	3.19	3.01	3.01	3.01
19.6	- -	- -	2.21	2.21	2.03	2.03	2.03
20.7	- -	- -	- -	2.72	1.27	1.27	1.27
25.5	- -	- -	- -	- -	- -	1.27	1.27
29.0	- -	- -	- -	- -	- -	- -	1.27

(1) The rates shown in this table reflect 2020 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $0.75 (current Dollars in 2020).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-25

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2020 - PM2 (3:30 - 5:30 PM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.75	0.75	0.75	0.75	0.75	0.75
27.6	- -	0.75	0.75	0.75	0.75	0.75
25.6	- -	- -	0.75	0.75	0.75	0.75
22.5	- -	- -	0.75	0.75	0.75	0.75
21.5	- -	- -	0.75	0.75	0.75	0.75
20.7	- -	- -	- -	0.75	0.75	0.75
18.1	- -	- -	- -	- -	0.75	0.75
16.0	- -	- -	- -	- -	- -	0.75

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	1.55	1.55	9.50	9.50	16.70	16.70	16.70
16.0	- -	1.55	9.50	9.50	16.70	16.70	16.70
19.6	- -	- -	7.95	7.95	15.15	15.15	15.15
20.7	- -	- -	- -	19.20	13.20	13.20	13.20
25.5	- -	- -	- -	- -	- -	13.20	13.20
29.0	- -	- -	- -	- -	- -	- -	13.20

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.54	0.54	0.54	0.54	0.54	0.54
27.6	- -	0.54	0.54	0.54	0.54	0.54
25.6	- -	- -	0.54	0.54	0.54	0.54
22.5	- -	- -	0.54	0.54	0.54	0.54
21.5	- -	- -	0.54	0.54	0.54	0.54
20.7	- -	- -	- -	0.54	0.54	0.54
18.1	- -	- -	- -	- -	0.54	0.54
16.0	- -	- -	- -	- -	- -	0.54

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	1.12	1.12	6.89	6.89	12.11	12.11	12.11
16.0	- -	1.12	6.89	6.89	12.11	12.11	12.11
19.6	- -	- -	5.77	5.77	10.99	10.99	10.99
20.7	- -	- -	- -	13.93	9.58	9.58	9.58
25.5	- -	- -	- -	- -	- -	9.58	9.58
29.0	- -	- -	- -	- -	- -	- -	9.58

(1) The rates shown in this table reflect 2020 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $0.75 (current Dollars in 2020).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-26

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2020 - PM3 (5:30 - 6:30 PM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	4.90	4.90	4.90	5.05	5.25	5.25
27.6	- -	4.90	4.90	5.05	5.25	5.25
25.6	- -	- -	4.90	5.05	5.25	5.25
22.5	- -	- -	4.90	0.75	0.75	0.75
21.5	- -	- -	4.90	0.75	0.75	0.75
20.7	- -	- -	- -	0.75	0.75	0.75
18.1	- -	- -	- -	- -	0.75	0.75
16.0	- -	- -	- -	- -	- -	0.75

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.75	0.75	8.60	8.60	14.85	14.85	14.85
16.0	- -	0.75	8.60	8.60	14.85	14.85	14.85
19.6	- -	- -	8.00	8.00	14.25	14.25	14.25
20.7	- -	- -	- -	19.25	12.75	12.75	12.75
25.5	- -	- -	- -	- -	- -	12.75	12.75
29.0	- -	- -	- -	- -	- -	- -	12.75

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	3.55	3.55	3.55	3.66	3.81	3.81
27.6	- -	3.55	3.55	3.66	3.81	3.81
25.6	- -	- -	3.55	3.66	3.81	3.81
22.5	- -	- -	3.55	0.54	0.54	0.54
21.5	- -	- -	3.55	0.54	0.54	0.54
20.7	- -	- -	- -	0.54	0.54	0.54
18.1	- -	- -	- -	- -	0.54	0.54
16.0	- -	- -	- -	- -	- -	0.54

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.54	0.54	6.24	6.24	10.77	10.77	10.77
16.0	- -	0.54	6.24	6.24	10.77	10.77	10.77
19.6	- -	- -	5.80	5.80	10.34	10.34	10.34
20.7	- -	- -	- -	13.96	9.25	9.25	9.25
25.5	- -	- -	- -	- -	- -	9.25	9.25
29.0	- -	- -	- -	- -	- -	- -	9.25

(1) The rates shown in this table reflect 2020 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $0.75 (current Dollars in 2020).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-27

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2020 - PM4 (6:30 - 7:00 PM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.75	0.75	0.75	0.75	0.75	0.75
27.6	- -	0.75	0.75	0.75	0.75	0.75
25.6	- -	- -	0.75	0.75	0.75	0.75
22.5	- -	- -	0.75	0.75	0.75	0.75
21.5	- -	- -	0.75	0.75	0.75	0.75
20.7	- -	- -	- -	0.75	0.75	0.75
18.1	- -	- -	- -	- -	0.75	0.75
16.0	- -	- -	- -	- -	- -	0.75

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.54	0.54	0.54	0.54	0.54	0.54
27.6	- -	0.54	0.54	0.54	0.54	0.54
25.6	- -	- -	0.54	0.54	0.54	0.54
22.5	- -	- -	0.54	0.54	0.54	0.54
21.5	- -	- -	0.54	0.54	0.54	0.54
20.7	- -	- -	- -	0.54	0.54	0.54
18.1	- -	- -	- -	- -	0.54	0.54
16.0	- -	- -	- -	- -	- -	0.54

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.75	0.75	4.10	4.10	7.25	7.25	7.25
16.0	- -	0.75	4.10	4.10	7.25	7.25	7.25
19.6	- -	- -	3.75	3.75	6.85	6.85	6.85
20.7	- -	- -	- -	9.15	6.15	6.15	6.15
25.5	- -	- -	- -	- -	- -	6.15	6.15
29.0	- -	- -	- -	- -	- -	- -	6.15

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.54	0.54	2.97	2.97	5.26	5.26	5.26
16.0	- -	0.54	2.97	2.97	5.26	5.26	5.26
19.6	- -	- -	2.72	2.72	4.97	4.97	4.97
20.7	- -	- -	- -	6.64	4.46	4.46	4.46
25.5	- -	- -	- -	- -	- -	4.46	4.46
29.0	- -	- -	- -	- -	- -	- -	4.46

(1) The rates shown in this table reflect 2020 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $0.75 (current Dollars in 2020).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-28

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2030 - AMO (5:00 - 5:30 AM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	1.00	1.00	1.00	1.00	1.00	1.00
27.6	- -	1.00	1.00	1.00	1.00	1.00
25.6	- -	- -	1.00	1.00	1.00	1.00
22.5	- -	- -	1.00	1.00	1.00	1.00
21.5	- -	- -	1.00	1.00	1.00	1.00
20.7	- -	- -	- -	1.00	1.00	1.00
18.1	- -	- -	- -	- -	1.00	1.00
16.0	- -	- -	- -	- -	- -	1.00

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16.0	- -	1.00	1.00	1.00	1.00	1.00	1.00
19.6	- -	- -	1.00	1.00	1.00	1.00	1.00
20.7	- -	- -	- -	1.00	1.00	1.00	1.00
25.5	- -	- -	- -	- -	- -	1.00	1.00
29.0	- -	- -	- -	- -	- -	- -	1.00

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.57	0.57	0.57	0.57	0.57	0.57
27.6	- -	0.57	0.57	0.57	0.57	0.57
25.6	- -	- -	0.57	0.57	0.57	0.57
22.5	- -	- -	0.57	0.57	0.57	0.57
21.5	- -	- -	0.57	0.57	0.57	0.57
20.7	- -	- -	- -	0.57	0.57	0.57
18.1	- -	- -	- -	- -	0.57	0.57
16.0	- -	- -	- -	- -	- -	0.57

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.57	0.57	0.57	0.57	0.57	0.57	0.57
16.0	- -	0.57	0.57	0.57	0.57	0.57	0.57
19.6	- -	- -	0.57	0.57	0.57	0.57	0.57
20.7	- -	- -	- -	0.57	0.57	0.57	0.57
25.5	- -	- -	- -	- -	- -	0.57	0.57
29.0	- -	- -	- -	- -	- -	- -	0.57

(1) The rates shown in this table reflect 2030 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $1.00 (current Dollars in 2030).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-29

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2030 - AM1 (5:30 - 6:30 AM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	4.15	4.15	4.15	4.55	4.75	4.75
27.6	- -	4.15	4.15	4.55	4.75	4.75
25.6	- -	- -	4.15	4.55	4.75	4.75
22.5	- -	- -	5.55	2.40	2.40	2.40
21.5	- -	- -	5.55	2.40	2.40	2.40
20.7	- -	- -	- -	2.40	2.40	2.40
18.1	- -	- -	- -	- -	1.00	1.00
16.0	- -	- -	- -	- -	- -	1.00

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16.0	- -	1.00	1.00	1.00	1.00	1.00	1.00
19.6	- -	- -	1.00	1.00	1.00	1.00	1.00
20.7	- -	- -	- -	1.00	1.00	1.00	1.00
25.5	- -	- -	- -	- -	- -	1.00	1.00
29.0	- -	- -	- -	- -	- -	- -	1.00

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	2.35	2.35	2.35	2.58	2.69	2.69
27.6	- -	2.35	2.35	2.58	2.69	2.69
25.6	- -	- -	2.35	2.58	2.69	2.69
22.5	- -	- -	3.15	1.36	1.36	1.36
21.5	- -	- -	3.15	1.36	1.36	1.36
20.7	- -	- -	- -	1.36	1.36	1.36
18.1	- -	- -	- -	- -	0.57	0.57
16.0	- -	- -	- -	- -	- -	0.57

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.57	0.57	0.57	0.57	0.57	0.57	0.57
16.0	- -	0.57	0.57	0.57	0.57	0.57	0.57
19.6	- -	- -	0.57	0.57	0.57	0.57	0.57
20.7	- -	- -	- -	0.57	0.57	0.57	0.57
25.5	- -	- -	- -	- -	- -	0.57	0.57
29.0	- -	- -	- -	- -	- -	- -	0.57

(1) The rates shown in this table reflect 2030 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $1.00 (current Dollars in 2030).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-30

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2030 - AM2 (6:30 - 8:30 AM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	15.00	15.00	15.00	18.40	19.15	19.15
27.6	- -	15.00	15.00	18.40	19.15	19.15
25.6	- -	- -	15.00	18.40	19.15	19.15
22.5	- -	- -	19.25	7.65	8.40	8.40
21.5	- -	- -	19.25	7.65	8.40	8.40
20.7	- -	- -	- -	7.65	8.40	8.40
18.1	- -	- -	- -	- -	1.00	1.00
16.0	- -	- -	- -	- -	- -	1.00

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16.0	- -	1.00	1.00	1.00	1.00	1.00	1.00
19.6	- -	- -	1.00	1.00	1.00	1.00	1.00
20.7	- -	- -	- -	1.00	1.00	1.00	1.00
25.5	- -	- -	- -	- -	- -	1.00	1.00
29.0	- -	- -	- -	- -	- -	- -	1.00

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	8.50	8.50	8.50	10.43	10.85	10.85
27.6	- -	8.50	8.50	10.43	10.85	10.85
25.6	- -	- -	8.50	10.43	10.85	10.85
22.5	- -	- -	10.91	4.34	4.76	4.76
21.5	- -	- -	10.91	4.34	4.76	4.76
20.7	- -	- -	- -	4.34	4.76	4.76
18.1	- -	- -	- -	- -	0.57	0.57
16.0	- -	- -	- -	- -	- -	0.57

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.57	0.57	0.57	0.57	0.57	0.57	0.57
16.0	- -	0.57	0.57	0.57	0.57	0.57	0.57
19.6	- -	- -	0.57	0.57	0.57	0.57	0.57
20.7	- -	- -	- -	0.57	0.57	0.57	0.57
25.5	- -	- -	- -	- -	- -	0.57	0.57
29.0	- -	- -	- -	- -	- -	- -	0.57

(1) The rates shown in this table reflect 2030 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $1.00 (current Dollars in 2030).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-31

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2030 - AM3 (8:30 - 9:30 AM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	7.50	7.50	7.50	10.45	11.00	11.00
27.6	- -	7.50	7.50	10.45	11.00	11.00
25.6	- -	- -	7.50	10.45	11.00	11.00
22.5	- -	- -	10.75	6.20	6.75	6.75
21.5	- -	- -	10.75	6.20	6.75	6.75
20.7	- -	- -	- -	6.20	6.75	6.75
18.1	- -	- -	- -	- -	1.00	1.00
16.0	- -	- -	- -	- -	- -	1.00

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16.0	- -	1.00	1.00	1.00	1.00	1.00	1.00
19.6	- -	- -	1.00	1.00	1.00	1.00	1.00
20.7	- -	- -	- -	1.00	1.00	1.00	1.00
25.5	- -	- -	- -	- -	- -	1.00	1.00
29.0	- -	- -	- -	- -	- -	- -	1.00

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	4.25	4.25	4.25	5.92	6.23	6.23
27.6	- -	4.25	4.25	5.92	6.23	6.23
25.6	- -	- -	4.25	5.92	6.23	6.23
22.5	- -	- -	6.09	3.51	3.83	3.83
21.5	- -	- -	6.09	3.51	3.83	3.83
20.7	- -	- -	- -	3.51	3.83	3.83
18.1	- -	- -	- -	- -	0.57	0.57
16.0	- -	- -	- -	- -	- -	0.57

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.57	0.57	0.57	0.57	0.57	0.57	0.57
16.0	- -	0.57	0.57	0.57	0.57	0.57	0.57
19.6	- -	- -	0.57	0.57	0.57	0.57	0.57
20.7	- -	- -	- -	0.57	0.57	0.57	0.57
25.5	- -	- -	- -	- -	- -	0.57	0.57
29.0	- -	- -	- -	- -	- -	- -	0.57

(1) The rates shown in this table reflect 2030 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $1.00 (current Dollars in 2030).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-32

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2030 - MD1 (9:30 AM - 2:30 PM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	1.00	1.00	1.00	1.00	1.00	1.00
27.6	- -	1.00	1.00	1.00	1.00	1.00
25.6	- -	- -	1.00	1.00	1.00	1.00
22.5	- -	- -	1.00	1.00	1.00	1.00
21.5	- -	- -	1.00	1.00	1.00	1.00
20.7	- -	- -	- -	1.00	1.00	1.00
18.1	- -	- -	- -	- -	1.00	1.00
16.0	- -	- -	- -	- -	- -	1.00

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16.0	- -	1.00	1.00	1.00	1.00	1.00	1.00
19.6	- -	- -	1.00	1.00	1.00	1.00	1.00
20.7	- -	- -	- -	1.00	1.00	1.00	1.00
25.5	- -	- -	- -	- -	- -	1.00	1.00
29.0	- -	- -	- -	- -	- -	- -	1.00

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.57	0.57	0.57	0.57	0.57	0.57
27.6	- -	0.57	0.57	0.57	0.57	0.57
25.6	- -	- -	0.57	0.57	0.57	0.57
22.5	- -	- -	0.57	0.57	0.57	0.57
21.5	- -	- -	0.57	0.57	0.57	0.57
20.7	- -	- -	- -	0.57	0.57	0.57
18.1	- -	- -	- -	- -	0.57	0.57
16.0	- -	- -	- -	- -	- -	0.57

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.57	0.57	0.57	0.57	0.57	0.57	0.57
16.0	- -	0.57	0.57	0.57	0.57	0.57	0.57
19.6	- -	- -	0.57	0.57	0.57	0.57	0.57
20.7	- -	- -	- -	0.57	0.57	0.57	0.57
25.5	- -	- -	- -	- -	- -	0.57	0.57
29.0	- -	- -	- -	- -	- -	- -	0.57

(1) The rates shown in this table reflect 2030 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $1.00 (current Dollars in 2030).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-33

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2030 - PM1 (2:30 - 3:30 PM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	1.00	1.00	1.00	1.00	1.00	1.00
27.6	- -	1.00	1.00	1.00	1.00	1.00
25.6	- -	- -	1.00	1.00	1.00	1.00
22.5	- -	- -	1.00	1.00	1.00	1.00
21.5	- -	- -	1.00	1.00	1.00	1.00
20.7	- -	- -	- -	1.00	1.00	1.00
18.1	- -	- -	- -	- -	1.00	1.00
16.0	- -	- -	- -	- -	- -	1.00

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	1.55	1.55	7.50	7.50	8.40	8.40	8.40
16.0	- -	1.55	7.50	7.50	8.40	8.40	8.40
19.6	- -	- -	6.25	6.25	6.85	6.85	6.85
20.7	- -	- -	- -	11.40	6.15	6.15	6.15
25.5	- -	- -	- -	- -	- -	6.15	6.15
29.0	- -	- -	- -	- -	- -	- -	6.15

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.57	0.57	0.57	0.57	0.57	0.57
27.6	- -	0.57	0.57	0.57	0.57	0.57
25.6	- -	- -	0.57	0.57	0.57	0.57
22.5	- -	- -	0.57	0.57	0.57	0.57
21.5	- -	- -	0.57	0.57	0.57	0.57
20.7	- -	- -	- -	0.57	0.57	0.57
18.1	- -	- -	- -	- -	0.57	0.57
16.0	- -	- -	- -	- -	- -	0.57

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.88	0.88	4.25	4.25	4.76	4.76	4.76
16.0	- -	0.88	4.25	4.25	4.76	4.76	4.76
19.6	- -	- -	3.54	3.54	3.88	3.88	3.88
20.7	- -	- -	- -	6.46	3.49	3.49	3.49
25.5	- -	- -	- -	- -	- -	3.49	3.49
29.0	- -	- -	- -	- -	- -	- -	3.49

(1) The rates shown in this table reflect 2030 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $1.00 (current Dollars in 2030).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-34

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2030 - PM2 (3:30 - 5:30 PM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	1.15	1.15	1.15	1.55	2.10	2.10
27.6	- -	1.15	1.15	1.55	2.10	2.10
25.6	- -	- -	1.15	1.55	2.10	2.10
22.5	- -	- -	1.15	1.00	1.00	1.00
21.5	- -	- -	1.15	1.00	1.00	1.00
20.7	- -	- -	- -	1.00	1.00	1.00
18.1	- -	- -	- -	- -	1.00	1.00
16.0	- -	- -	- -	- -	- -	1.00

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	3.90	3.90	14.35	14.35	24.95	24.95	24.95
16.0	- -	3.90	14.35	14.35	24.95	24.95	24.95
19.6	- -	- -	10.45	10.45	21.05	21.05	21.05
20.7	- -	- -	- -	24.60	17.60	17.60	17.60
25.5	- -	- -	- -	- -	- -	17.60	17.60
29.0	- -	- -	- -	- -	- -	- -	17.60

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	0.65	0.65	0.65	0.88	1.19	1.19
27.6	- -	0.65	0.65	0.88	1.19	1.19
25.6	- -	- -	0.65	0.88	1.19	1.19
22.5	- -	- -	0.65	0.57	0.57	0.57
21.5	- -	- -	0.65	0.57	0.57	0.57
20.7	- -	- -	- -	0.57	0.57	0.57
18.1	- -	- -	- -	- -	0.57	0.57
16.0	- -	- -	- -	- -	- -	0.57

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	2.21	2.21	8.13	8.13	14.14	14.14	14.14
16.0	- -	2.21	8.13	8.13	14.14	14.14	14.14
19.6	- -	- -	5.92	5.92	11.93	11.93	11.93
20.7	- -	- -	- -	13.94	9.97	9.97	9.97
25.5	- -	- -	- -	- -	- -	9.97	9.97
29.0	- -	- -	- -	- -	- -	- -	9.97

(1) The rates shown in this table reflect 2030 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $1.00 (current Dollars in 2030).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-35

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2030 - PM3 (5:30 - 6:30 PM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	11.25	11.25	11.25	12.45	13.95	13.95
27.6	- -	11.25	11.25	12.45	13.95	13.95
25.6	- -	- -	11.25	12.45	13.95	13.95
22.5	- -	- -	11.50	1.45	2.95	2.95
21.5	- -	- -	11.50	1.45	2.95	2.95
20.7	- -	- -	- -	1.45	2.95	2.95
18.1	- -	- -	- -	- -	1.50	1.50
16.0	- -	- -	- -	- -	- -	1.50

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	6.38	6.38	6.38	7.06	7.91	7.91
27.6	- -	6.38	6.38	7.06	7.91	7.91
25.6	- -	- -	6.38	7.06	7.91	7.91
22.5	- -	- -	6.52	0.82	1.67	1.67
21.5	- -	- -	6.52	0.82	1.67	1.67
20.7	- -	- -	- -	0.82	1.67	1.67
18.1	- -	- -	- -	- -	0.85	0.85
16.0	- -	- -	- -	- -	- -	0.85

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	1.95	1.95	13.40	13.40	25.20	25.20	25.20
16.0	- -	1.95	13.40	13.40	25.20	25.20	25.20
19.6	- -	- -	11.45	11.45	23.25	23.25	23.25
20.7	- -	- -	- -	27.80	19.80	19.80	19.80
25.5	- -	- -	- -	- -	- -	19.80	19.80
29.0	- -	- -	- -	- -	- -	- -	19.80

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	1.11	1.11	7.59	7.59	14.28	14.28	14.28
16.0	- -	1.11	7.59	7.59	14.28	14.28	14.28
19.6	- -	- -	6.49	6.49	13.18	13.18	13.18
20.7	- -	- -	- -	15.75	11.22	11.22	11.22
25.5	- -	- -	- -	- -	- -	11.22	11.22
29.0	- -	- -	- -	- -	- -	- -	11.22

(1) The rates shown in this table reflect 2030 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $1.00 (current Dollars in 2030).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

Table B-36

Estimated Average Toll Rates By Movement on Express Toll Lanes In Current and Constant 2007 Dollars

2030 - PM4 (6:30 - 7:00 PM)

I-405 Express Toll Lanes - Base Case

Current Dollar Toll Rates By Movement (1)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	3.00	3.00	3.00	3.15	3.35	3.35
27.6	- -	3.00	3.00	3.15	3.35	3.35
25.6	- -	- -	3.00	3.15	3.35	3.35
22.5	- -	- -	3.00	1.00	1.00	1.00
21.5	- -	- -	3.00	1.00	1.00	1.00
20.7	- -	- -	- -	1.00	1.00	1.00
18.1	- -	- -	- -	- -	1.00	1.00
16.0	- -	- -	- -	- -	- -	1.00

Constant 2007 Dollar Toll Rates By Movement (2)

Southbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp					
	27.6	25.6	20.7	19.4	16.0	15.0
29.0	1.70	1.70	1.70	1.79	1.90	1.90
27.6	- -	1.70	1.70	1.79	1.90	1.90
25.6	- -	- -	1.70	1.79	1.90	1.90
22.5	- -	- -	1.70	0.57	0.57	0.57
21.5	- -	- -	1.70	0.57	0.57	0.57
20.7	- -	- -	- -	0.57	0.57	0.57
18.1	- -	- -	- -	- -	0.57	0.57
16.0	- -	- -	- -	- -	- -	0.57

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	1.55	1.55	8.75	8.75	14.75	14.75	14.75
16.0	- -	1.55	8.75	8.75	14.75	14.75	14.75
19.6	- -	- -	7.20	7.20	13.20	13.20	13.20
20.7	- -	- -	- -	16.00	11.00	11.00	11.00
25.5	- -	- -	- -	- -	- -	11.00	11.00
29.0	- -	- -	- -	- -	- -	- -	11.00

Northbound Movements

MP of Express Toll Lane Ingress Ramp	Milepost (MP) of Express Toll Lane Egress Ramp						
	16.0	18.1	20.7	21.7	25.5	29.0	30.0
15.0	0.88	0.88	4.96	4.96	8.36	8.36	8.36
16.0	- -	0.88	4.96	4.96	8.36	8.36	8.36
19.6	- -	- -	4.08	4.08	7.48	7.48	7.48
20.7	- -	- -	- -	9.07	6.23	6.23	6.23
25.5	- -	- -	- -	- -	- -	6.23	6.23
29.0	- -	- -	- -	- -	- -	- -	6.23

(1) The rates shown in this table reflect 2030 estimated average toll rates in current dollars for this time period. A minimum toll requirement is set at $1.00 (current Dollars in 2030).

(2) The rates shown in this table reflect 2010 estimated average tolls in constant 2007 dollars for this time period. A 2.5 percent annual inflation rate was assumed for this estimate.

NOTE: A **Current Dollar** is the dollar value at the time of purchase.

A **Constant 2007 Dollar** is the dollar value in 2007. The value is adjusted to account for assumed inflationary impacts on the value of the dollar.

APPENDIX C:

TRANSPORTATION IMPROVEMENT PROJECTS INCLUDED IN PSRC'S 2014 AND 2030 GLOBAL DEMAND MODELS. APPENDIX C WAS PROVIDED BY WSDOT.

APPENDIX C: PROJECTS INCLUDED IN TRAFFIC MODELING

Within the I-405 corridor, there are four improvement projects assumed to be constructed in the 2014 Baseline Conditions and No Build Alternative. Exhibit D-1 shows the four projects assumed to be operational by 2014.

Exhibit D-1: I-405 projects assumed for 2014 within the I-405 corridor

I-405 projects assumed completed by 2014	
Location	Project
Kirkland	NE 128th Street HOV and Transit Access (Sound Transit Project)
Kirkland/King Co.	Kirkland Nickel Project - SR 520 to SR 522
Tukwila/Renton	Renton Nickel Improvement Project - I-5 to SR 169
Bellevue	Bellevue Nickel Improvement Project - I-90 to SE 8th Street

Outside of the I-405 corridor, the 2014 network will consist of projects that are currently planned and programmed by WSDOT and other transportation agencies. For the most part, these projects are fully funded or expected to be funded within the next six years. Exhibit D-2 lists projects which are consistent with the No Build Alternative assumptions used in the EIS.

Exhibit D-2: Transportation projects assumed for 2014 outside of I-405 corridor

Regional projects assumed to be completed by 2014	
Location	Project
Seattle/Tacoma	Sound Transit Link Light Rail (Phase 1)
Tacoma to Seattle Everett to Seattle	Sound Transit Commuter Rail
Regionwide	Sound Transit 2006 Bus Service Concepts
Pierce	SR 7 (SR 507 to SR 512) - Corridor Improvements
Pierce	SR 161 (S176th to S 234th Street) - Corridor Improvements
Pierce	SR 16 (Olympic View Drive to Union Avenue) - HOV Improvements
King	SR 161 (Jovita Boulevard to S 360th Street) - Widen to 5 Lanes
King	I-5 (Pierce County Line to S 320th) - Stage 4 HOV
King	I-5 Direct HOV/Transit Access at S 317th St and extension of HOV lanes (Federal Way)
King	SR 167 (15th Street SW to 15th Street NW) - HOV Improvement
King	SR 518 Add 1 eastbound GP lane from airport access to I-5 and Interchange Improvements
King	SR 519 - Phase 2
King	I-90 Direct HOV/Transit access Eastgate Park-and-Ride

Regional projects assumed to be completed by 2014		
Location		Project
King		SR 520 (West Lake Sammamish Parkway to SR 202) - Add HOV Lanes
King		SR 522 Access to UW Botlhell Campus
King		I-5 (NE 175th Street to NE 205th Street) - NB Auxiliary Lane
King		SR 99 (Aurora Avenue to N Corridor) - Transit/HOV Lanes
Snohomish		I-5 Direct HOV/Transit access Lynnwood Transit Center
Snohomish		SR 9 (SR 522 to 176th Street SE) - Stage 1 and 2
Snohomish		SR 525 (SR 99 to Paine Field) - 5 lanes
Snohomish		SR 527 (132nd SE to 112th SE) - Additional Lanes
Snohomish		I-5 (SR 526 to US 2) - HOV Lanes
2014 committed arterial projects (I-405 Corridor Program EIS Project # shown in second column)		
Bothell, Snohomish	R.AC-21	120th NE and 39th SE (NE 195th to Maltby Road) - 4/5 lanes including new connection
Bellevue	R-08	NE 29th Place (148th Avenue NE to NE 24th Street) - Construct new 2 lane road
Snohomish	R-10	SR 524 (24th Street SW to SR 527) - Widen to 4/5 lanes including sidewalks, bicycle lanes
Kirkland	R-21	NE 120th Street (Slater Avenue to 124th Avenue NE) - Construct new 3 lane roadway with pedestrian and bicycle facilities
Redmond/ WSDOT	R-25	SR 202 Corridor Improvements (East Lake Sammamish Parkway to Sahalee Way) - Widen to 3/5 lanes; intersection improvements with bicycle and pedestrian facilities
Redmond	R-26	NE 90th Street (Willows Road to SR 202) - Construct new 4/5 lanes with bicycle facilities
Redmond	R-28	West Lake Sammamish Parkway (Leary Way to Bel-Red Road) - Widen to 4/5 lanes with CGS*, bicycle lanes
Renton	R-36	Oakesdale Avenue SW (SW 31st to SW 16th) - Construct new 5 lane roadway with CGS
KCDOT	R-39 & R.AC-2	140th Avenue SE (SR 169 to SE 208th Street) - Widen to 5 lanes; (SR 169 to SE 196th Street) - Widen for turn channels on SE 196th. Combines 2 King County CIP projects. A major north-south arterial that serves the Soos Creek Plateau and Fairwood
KCDOT	R-40 & R.IC-24	Juanita-Woodinville Way (NE 145th Street to 112th Avenue NE) - Widen to 4/5 lanes with CGS, walkway/pathway
KCDOT	R-47	NE 124th Street (Willows Road to SR 202) - Widen to 3/4 lanes with CGS; bicycle facilities; traffic signal
Woodinville	R-51	Woodinville-Snohomish Road/140th Avenue NE (NE 175th Street to SR 522) - Widen to 4/5 lanes with CGS; bicycle lanes
Bellevue	R-101	150th Avenue SE (SE 36th to SE 38th) - Widen to 7 lanes; add turn lanes
Redmond	R-111 & R.AC-15	Willows Road Corridor Improvements - Channelization of Willows Road and Redmond Way intersection; widening of Willows Road from NE 116th to NE 124th
Snohomish	R-117	39th Avenue SE realignment at SR 524 and York Road - Construct 4-way intersection to replace 2 offset intersections
WSDOT	R.PB-27	SR 520 and SR 202 interchange - Complete interchange by constructing a new ramp and thru lane on SR 202 to SR 520 (ETP R-29) NOTE: Part of Nickel Package

Regional projects assumed to be completed by 2014	
Location	Project

* CGS – Curb, gutter, and sidewalks

Outside of the I-405 corridor, the 2030 network will consist of planned, programmed, and reasonably foreseeable projects to be implemented during the next 20 to 25 years. This network includes all of the projects assumed for 2014, plus additional regional and local projects that have been given high priority in recent programming processes. Several of these projects have the potential to affect the travel conditions along the I-405 corridor, so their inclusion in the network is important to establish realistic traffic forecasts for environmental and design purposes. All of the projects are included within the PSRC *Destination 2030* as being important to implement by 2030. While several projects are currently not funded, they have been consistently included in multi-jurisdictional funding forums, such as the RTID and ETP 10-year Mobility Action Priorities. Given the importance of transportation in the Puget Sound Region, it is reasonable to assume that transportation investments will continue throughout the next 30 years. The assumed projects represent only a portion of the overall regional needs.

The projects included in Exhibit D-3 are assumed to be completed by 2030. The selection of these projects met the following rationale:

- Included within *Destination 2030.*
- Included within established funding and prioritization processes (e.g., RTID, ETP, SKATBD, etc.).
- Could potentially affect transportation conditions along the I-405 corridor.
- Environmental processes either complete, in process, or expected to be underway by 2007.

By meeting these tests, the listed projects were considered to have a reasonable likelihood of being implemented prior to 2030.

Exhibit D-3: Regional projects assumed for 2030 outside the I-405 corridor

Regional projects assumed to be completed by 2030	
Location	**Project**
SR 410 (Pierce County)	Additional Lanes - 214th to 234th
SR 509 Extension (Tacoma)	6-lane freeway
I-5 (Tacoma)	New HOV Lanes - Port of Tacoma Road to King and Pierce County Line
SR 167 Extension (Tacoma)	6-lane freeway
SR 167 (I-405 to Puyallup)	Add HOV lanes - 15th Street SW to SR 161 (Puyallup) Add 1 lane each direction - SW 43rd St/S 180th St to SR 18
SR 18 (Auburn to I-90)	4-lane expressway - SR 516 to I-90
Alaskan Way Viaduct	Existing capacity - 4/6-lane expressway

Regional projects assumed to be completed by 2030	
Location	**Project**
I-90 Two-Way Transit and HOV	Alternative R-8A - no rail across I-90
SR 520 (I-405 to Montlake Boulevard)	4-lane freeway + 1 HOV lane (6-lane option)
SR 522 (Snohomish)	4 Lane Widening - Snohomish River to US 2

APPENDIX D:

ESTIMATED 2010, 2014, 2020 AND 2030 AVERAGE WEEKDAY EXPRESS TOLL LANE TRAFFIC VOLUMES BY TIME PERIOD BY MAINLINE AND INGRESS/EGRESS LOCATIONS

Figure D-1
Estimated 2010 Average Weekday Mainline and Ingress/Egress Express Toll Lane Traffic Volumes

Box Number: 1

	SOV	HOV2	HOV3+	Total
AMSH	1.5	0.3	0.1	1.9
AMPK	1.5	0.1	0.0	1.6
MD	1.6	0.7	0.3	2.5
PMSH	0.7	0.0	0.0	0.7
PMPK	2.5	0.0	0.0	2.5
Total	7.7	1.2	0.4	9.2

Box Number: 2

	SOV	HOV2	HOV3+	Total
AMSH	1.5	1.5	0.5	3.5
AMPK	1.5	2.4	0.8	4.7
MD	1.6	2.0	0.6	4.1
PMSH	0.7	0.7	0.2	1.6
PMPK	2.5	2.0	0.6	5.0
Total	7.7	8.6	2.6	18.9

Box Number: 3

	SOV	HOV2	HOV3+	Total
AMSH	0.8	0.6	0.2	1.6
AMPK	0.6	0.8	0.3	1.7
MD	0.7	1.0	0.4	2.1
PMSH	0.3	0.3	0.1	0.8
PMPK	1.0	0.9	0.3	2.2
Total	3.3	3.7	1.3	8.4

Box Number: 4

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.1	0.0	0.2
AMPK	0.0	0.2	0.1	0.3
MD	0.1	0.1	0.0	0.3
PMSH	0.0	0.1	0.0	0.1
PMPK	0.1	0.2	0.0	0.3
Total	0.2	0.7	0.2	1.1

Box Number: 5

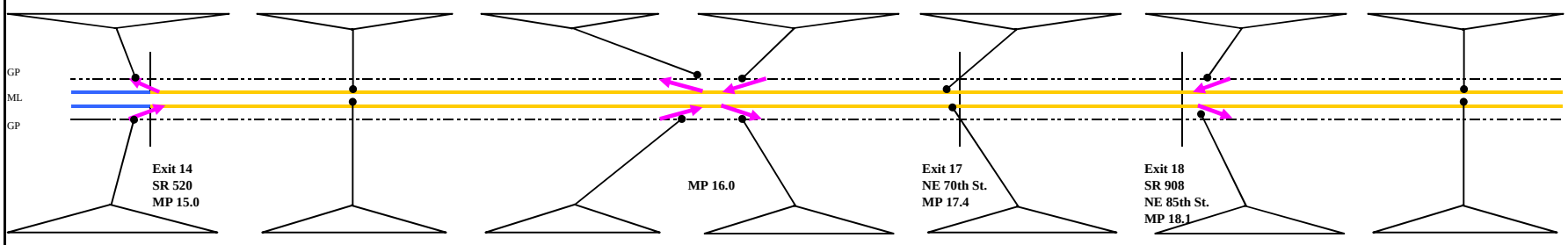
	SOV	HOV2	HOV3+	Total
AMSH	2.2	2.0	0.6	4.9
AMPK	2.0	3.1	1.1	6.1
MD	2.1	2.8	1.0	5.9
PMSH	1.0	1.0	0.3	2.3
PMPK	3.4	2.7	0.8	6.9
Total	10.7	11.7	3.7	26.1

Box Number: 6

	SOV	HOV2	HOV3+	Total
AMSH	0.1	0.2	0.1	0.4
AMPK	0.7	0.3	0.1	1.1
MD	0.2	0.3	0.1	0.6
PMSH	0.1	0.1	0.0	0.3
PMPK	0.7	0.2	0.1	1.0
Total	1.8	1.1	0.4	3.3

Box Number: 7

	SOV	HOV2	HOV3+	Total
AMSH	2.1	1.8	0.6	4.5
AMPK	1.3	2.8	0.9	5.1
MD	1.9	2.6	0.8	5.3
PMSH	0.9	0.9	0.2	2.0
PMPK	2.7	2.5	0.7	5.9
Total	8.9	10.5	3.3	22.8



Box Number: 8

	SOV	HOV2	HOV3+	Total
AMSH	0.2	0.2	0.0	0.4
AMPK	0.4	0.3	0.1	0.8
MD	1.6	1.3	0.4	3.4
PMSH	1.3	0.5	0.2	2.0
PMPK	2.6	0.6	0.2	3.5
Total	6.1	3.0	0.9	10.0

Box Number: 9

	SOV	HOV2	HOV3+	Total
AMSH	0.2	1.0	0.3	1.4
AMPK	0.4	1.8	0.5	2.7
MD	1.6	3.8	1.1	6.6
PMSH	1.3	2.0	0.6	3.8
PMPK	2.6	4.4	1.3	8.4
Total	6.1	13.0	3.8	22.9

Box Number: 10

	SOV	HOV2	HOV3+	Total
AMSH	0.1	0.3	0.1	0.4
AMPK	0.1	0.3	0.1	0.4
MD	0.3	1.0	0.3	1.6
PMSH	0.4	0.4	0.1	1.0
PMPK	0.6	0.8	0.3	1.6
Total	1.5	2.8	0.9	5.1

Box Number: 11

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.1	0.0	0.1
AMPK	0.0	0.2	0.1	0.3
MD	0.1	0.6	0.1	0.8
PMSH	0.0	0.3	0.1	0.4
PMPK	0.2	0.6	0.2	1.0
Total	0.3	1.8	0.5	2.7

Box Number: 12

	SOV	HOV2	HOV3+	Total
AMSH	0.3	1.1	0.3	1.7
AMPK	0.4	1.9	0.6	2.9
MD	1.9	4.2	1.3	7.4
PMSH	1.7	2.1	0.6	4.4
PMPK	3.0	4.6	1.4	9.0
Total	7.3	13.9	4.2	25.4

Box Number: 13

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.5	0.2	0.8
AMPK	0.0	0.9	0.3	1.2
MD	0.1	1.6	0.6	2.2
PMSH	0.3	0.5	0.2	1.0
PMPK	0.7	0.7	0.3	1.7
Total	1.2	4.2	1.5	6.9

Box Number: 14

	SOV	HOV2	HOV3+	Total
AMSH	0.2	0.6	0.1	1.0
AMPK	0.4	1.0	0.3	1.7
MD	1.8	2.7	0.7	5.1
PMSH	1.4	1.6	0.4	3.4
PMPK	2.3	3.9	1.1	7.3
Total	6.1	9.7	2.6	18.5

Box Number: 15

	SOV	HOV2	HOV3+	Total
AMSH	0.3	0.6	0.2	1.1
AMPK	0.2	0.9	0.3	1.4
MD	0.1	0.9	0.3	1.3
PMSH	0.1	0.2	0.1	0.4
PMPK	0.2	0.6	0.2	1.0
Total	0.8	3.2	1.1	5.2

Box Number: 16

	SOV	HOV2	HOV3+	Total
AMSH	2.4	2.4	0.8	5.7
AMPK	1.5	3.7	1.3	6.5
MD	2.1	3.4	1.1	6.6
PMSH	0.9	1.1	0.3	2.4
PMPK	2.9	3.0	0.9	6.9
Total	9.8	13.8	4.4	28.0

Box Number: 17

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.4	0.1	0.6
AMPK	0.0	0.8	0.3	1.1
MD	0.0	0.9	0.3	1.2
PMSH	0.0	0.4	0.1	0.5
PMPK	0.1	0.9	0.3	1.2
Total	0.2	3.3	1.1	4.6

Box Number: 18

	SOV	HOV2	HOV3+	Total
AMSH	0.1	0.4	0.1	0.7
AMPK	0.0	0.7	0.3	1.0
MD	0.0	1.3	0.4	1.8
PMSH	0.0	0.5	0.2	0.7
PMPK	0.0	0.9	0.3	1.2
Total	0.1	3.9	1.3	5.3

Box Number: 19

	SOV	HOV2	HOV3+	Total
AMSH	2.4	2.5	0.8	5.8
AMPK	1.5	3.6	1.3	6.4
MD	2.0	3.8	1.3	7.1
PMSH	0.9	1.2	0.4	2.5
PMPK	2.9	3.1	0.9	6.9
Total	9.7	14.3	4.7	28.7

Box Number: 20

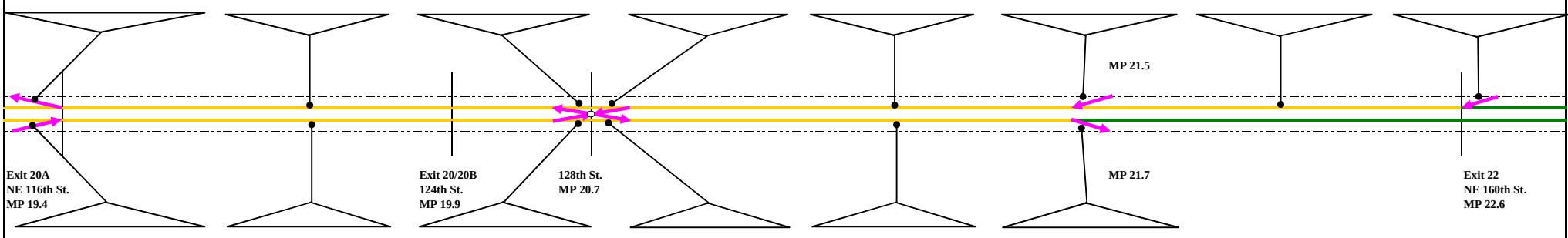
	SOV	HOV2	HOV3+	Total
AMSH	0.1	0.2	0.1	0.3
AMPK	0.1	0.3	0.1	0.4
MD	0.1	0.2	0.1	0.4
PMSH	0.1	0.1	0.0	0.2
PMPK	0.2	0.3	0.1	0.6
Total	0.6	1.0	0.4	2.0

Box Number: 21

	SOV	HOV2	HOV3+	Total
AMSH	2.3	2.4	0.8	5.4
AMPK	1.4	3.4	1.2	5.9
MD	1.9	3.6	1.2	6.7
PMSH	0.9	1.1	0.3	2.3
PMPK	2.7	2.8	0.9	6.3
Total	9.1	13.3	4.3	26.7

Box Number: 22

	SOV	HOV2	HOV3+	Total
AMSH	1.4	0.8	0.3	2.4
AMPK	1.0	1.5	0.5	3.0
MD	1.3	0.8	0.3	2.3
PMSH	0.5	0.3	0.1	0.9
PMPK	1.3	0.8	0.2	2.3
Total	5.6	4.0	1.3	10.9



Box Number: 23

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.1	0.0	0.1
AMPK	0.1	0.1	0.0	0.2
MD	0.2	0.5	0.1	0.7
PMSH	0.0	0.5	0.2	0.7
PMPK	0.1	1.2	0.4	1.7
Total	0.4	2.3	0.8	3.5

Box Number: 24

	SOV	HOV2	HOV3+	Total
AMSH	0.3	0.7	0.2	1.1
AMPK	0.5	1.1	0.3	1.9
MD	1.9	3.1	0.9	5.9
PMSH	1.4	2.1	0.6	4.1
PMPK	2.4	5.0	1.5	9.0
Total	6.5	12.0	3.4	22.0

Box Number: 25

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.2	0.1	0.3
AMPK	0.0	0.2	0.1	0.3
MD	0.0	1.2	0.4	1.5
PMSH	0.1	0.6	0.2	0.9
PMPK	0.2	1.6	0.5	2.3
Total	0.3	3.8	1.2	5.3

Box Number: 26

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.2	0.1	0.3
AMPK	0.0	0.3	0.1	0.5
MD	0.0	1.0	0.3	1.4
PMSH	0.0	0.5	0.2	0.7
PMPK	0.0	1.3	0.5	1.8
Total	0.1	3.4	1.2	4.7

Box Number: 27

	SOV	HOV2	HOV3+	Total
AMSH	0.3	0.7	0.2	1.1
AMPK	0.5	1.2	0.3	2.1
MD	1.9	3.0	0.8	5.7
PMSH	1.3	2.0	0.6	3.9
PMPK	2.3	4.7	1.5	8.5
Total	6.3	11.6	3.4	21.3

Box Number: 28

	SOV	HOV2	HOV3+	Total
AMSH	0.1	0.2	0.0	0.4
AMPK	0.1	0.4	0.1	0.5
MD	0.7	1.3	0.4	2.3
PMSH	0.7	0.9	0.3	1.8
PMPK	1.3	2.1	0.7	4.1
Total	2.9	4.8	1.5	9.2

Box Number: 29

	SOV	HOV2	HOV3+	Total
AMSH	0.9	1.6	0.5	3.0
AMPK	0.4	1.9	0.7	3.0
MD	0.6	2.9	0.9	4.4
PMSH	0.3	0.8	0.2	1.4
PMPK	1.4	2.0	0.6	4.0
Total	3.6	9.2	3.0	15.8

Box Number: 30

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.2	0.1	0.3
AMPK	0.0	0.2	0.1	0.3
MD	0.1	0.4	0.1	0.6
PMSH	0.0	0.1	0.0	0.2
PMPK	0.1	0.3	0.1	0.5
Total	0.2	1.2	0.4	1.8

Box Number: 31

	SOV	HOV2	HOV3+	Total
AMSH	0.2	0.5	0.2	0.9
AMPK	0.0	0.6	0.2	0.8
MD	0.1	0.7	0.2	1.1
PMSH	0.1	0.3	0.1	0.4
PMPK	0.2	0.6	0.2	0.9
Total	0.6	2.6	0.9	4.1

Box Number: 32

	SOV	HOV2	HOV3+	Total
AMSH	0.8	1.3	0.4	2.4
AMPK	0.4	1.5	0.5	2.4
MD	0.5	2.6	0.8	3.9
PMSH	0.3	0.7	0.2	1.1
PMPK	1.3	1.7	0.5	3.6
Total	3.2	7.8	2.5	13.5

Box Number: 33

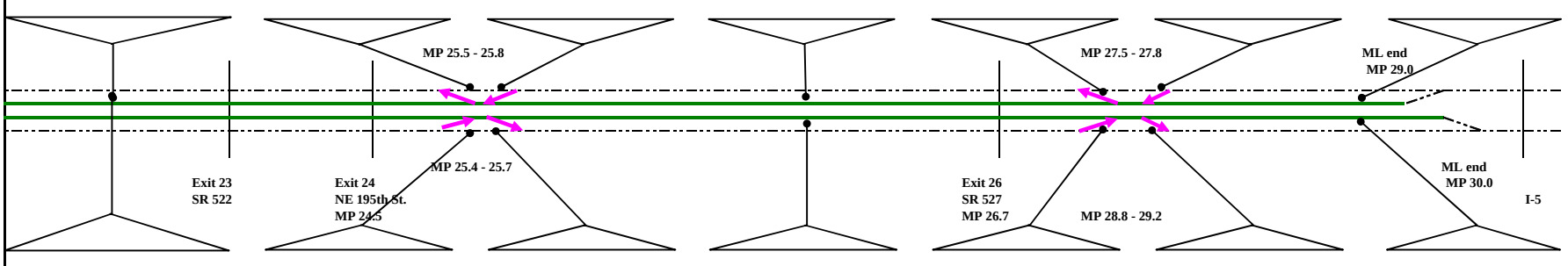
	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.2	0.1	0.3
AMPK	0.0	0.4	0.2	0.6
MD	0.1	0.3	0.1	0.5
PMSH	0.0	0.1	0.0	0.2
PMPK	0.1	0.2	0.1	0.4
Total	0.2	1.2	0.5	2.0

Box Number: 34

	SOV	HOV2	HOV3+	Total
AMSH	0.3	0.1	0.0	0.4
AMPK	0.0	0.0	0.0	0.0
MD	0.2	0.5	0.1	0.8
PMSH	0.1	0.2	0.0	0.3
PMPK	0.5	0.4	0.1	0.9
Total	1.1	1.1	0.3	2.5

Box Number: 35

	SOV	HOV2	HOV3+	Total
AMSH	0.5	1.3	0.5	2.3
AMPK	0.4	1.9	0.7	3.0
MD	0.4	2.4	0.8	3.6
PMSH	0.2	0.6	0.2	1.0
PMPK	0.9	1.6	0.6	3.0
Total	2.3	7.9	2.8	13.0



Box Number: 36

	SOV	HOV2	HOV3+	Total
AMSH	0.2	0.5	0.1	0.8
AMPK	0.5	0.8	0.2	1.5
MD	1.2	1.7	0.4	3.4
PMSH	0.6	1.1	0.3	2.1
PMPK	0.9	2.7	0.8	4.4
Total	3.4	6.8	1.9	12.1

Box Number: 37

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.1	0.0	0.2
AMPK	0.1	0.3	0.1	0.5
MD	0.1	0.3	0.1	0.5
PMSH	0.1	0.2	0.1	0.4
PMPK	0.1	0.4	0.2	0.7
Total	0.4	1.3	0.5	2.2

Box Number: 38

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.1	0.0	0.1
AMPK	0.0	0.1	0.0	0.2
MD	0.2	0.7	0.2	1.0
PMSH	0.1	0.4	0.1	0.6
PMPK	0.1	0.9	0.3	1.3
Total	0.4	2.2	0.7	3.3

Box Number: 39

	SOV	HOV2	HOV3+	Total
AMSH	0.2	0.5	0.1	0.8
AMPK	0.6	1.0	0.3	1.8
MD	1.2	1.4	0.3	2.8
PMSH	0.6	1.0	0.3	1.8
PMPK	0.9	2.2	0.7	3.7
Total	3.4	5.9	1.7	11.0

Box Number: 40

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.0	0.0	0.1
AMPK	0.0	0.0	0.0	0.1
MD	0.0	0.1	0.0	0.1
PMSH	0.0	0.0	0.0	0.1
PMPK	0.0	0.3	0.2	0.5
Total	0.1	0.4	0.2	0.8

Box Number: 41

	SOV	HOV2	HOV3+	Total
AMSH	0.1	0.2	0.0	0.3
AMPK	0.2	0.5	0.2	0.8
MD	0.4	0.9	0.2	1.6
PMSH	0.2	0.6	0.0	0.8
PMPK	0.3	1.3	0.1	1.7
Total	1.2	3.4	0.6	5.2

Box Number: 42

	SOV	HOV2	HOV3+	Total
AMSH	0.1	0.3	0.1	0.6
AMPK	0.4	0.5	0.1	1.1
MD	0.8	0.5	0.1	1.4
PMSH	0.4	0.4	0.2	1.0
PMPK	0.6	1.2	0.7	2.5
Total	2.3	3.0	1.3	6.6

LEGEND

	1 Express Toll Lane	AMSH (AM Shoulder) 5:00-6:30 a.m., 8:30-9:30 a.m	SOV (Single Occupant Vehicle)
	2 Express Toll Lanes	AMPK (AM Peak) 6:30-8:30 a.m.	HOV (High Occupancy Vehicle)
	High Occupancy Vehicle (HOV) Lane	MD (Midday) 9:30 a.m.-2:30 p.m.	HOV 2 (HOV with two occupants)
	General Purpose (GP) Lane	PMSH (PM Shoulder) 2:30-3:30 p.m., 6:30-7:00 p.m.	HOV 3+ (HOV with three or more occupants)
0.0	Weekday Express Toll Lane Traffic Volumes	PMPK (PM Peak) 3:30-6:30 p.m.	
		Total Weekday Express Toll Lane Traffic Volume) 5:00 a.m.-7:00 p.m	

NOTE: All volumes shown represent thousands of vehicles.

Figure D-2
Estimated 2014 Average Weekday Mainline and Ingress/Egress Express Toll Lane Traffic Volumes

Box Number: 1

	SOV	HOV2	HOV3+	Total
AMSH	1.4	0.3	0.1	1.8
AMPK	1.5	0.1	0.0	1.6
MD	1.9	0.5	0.2	2.5
PMSH	0.9	0.0	0.0	0.9
PMPK	2.8	0.0	0.0	2.8
Total	8.4	0.9	0.3	9.5

Box Number: 2

	SOV	HOV2	HOV3+	Total
AMSH	1.4	1.5	0.5	3.4
AMPK	1.5	2.4	0.8	4.6
MD	1.9	2.1	0.6	4.6
PMSH	0.9	0.8	0.2	1.8
PMPK	2.8	1.9	0.5	5.2
Total	8.4	8.7	2.6	19.7

Box Number: 3

	SOV	HOV2	HOV3+	Total
AMSH	0.7	0.7	0.2	1.6
AMPK	0.5	0.8	0.3	1.7
MD	0.8	0.9	0.4	2.1
PMSH	0.4	0.4	0.1	0.8
PMPK	1.2	0.9	0.3	2.4
Total	3.7	3.7	1.3	8.7

Box Number: 4

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.1	0.0	0.2
AMPK	0.0	0.2	0.1	0.3
MD	0.1	0.1	0.0	0.2
PMSH	0.0	0.1	0.0	0.1
PMPK	0.1	0.2	0.0	0.3
Total	0.3	0.7	0.2	1.1

Box Number: 5

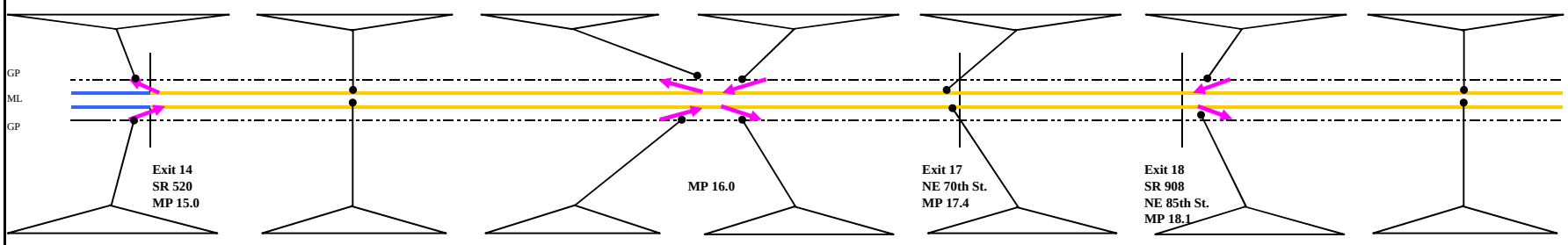
	SOV	HOV2	HOV3+	Total
AMSH	2.1	2.1	0.7	4.9
AMPK	2.0	3.0	1.0	6.0
MD	2.6	2.9	1.0	6.5
PMSH	1.2	1.0	0.3	2.6
PMPK	3.9	2.6	0.8	7.3
Total	11.8	11.7	3.7	27.2

Box Number: 6

	SOV	HOV2	HOV3+	Total
AMSH	0.2	0.2	0.1	0.4
AMPK	0.6	0.3	0.1	1.0
MD	0.2	0.2	0.1	0.6
PMSH	0.2	0.1	0.0	0.3
PMPK	0.8	0.3	0.1	1.1
Total	1.9	1.1	0.4	3.3

Box Number: 7

	SOV	HOV2	HOV3+	Total
AMSH	1.9	1.9	0.6	4.4
AMPK	1.4	2.7	0.9	5.0
MD	2.4	2.7	0.9	5.9
PMSH	1.1	0.9	0.3	2.3
PMPK	3.2	2.4	0.7	6.3
Total	9.9	10.6	3.3	23.9



Box Number: 8

	SOV	HOV2	HOV3+	Total
AMSH	0.3	0.3	0.1	0.6
AMPK	0.6	0.3	0.1	0.9
MD	2.3	1.3	0.4	4.0
PMSH	1.3	0.4	0.1	1.9
PMPK	2.1	0.7	0.3	3.1
Total	6.5	3.0	0.9	10.4

Box Number: 9

	SOV	HOV2	HOV3+	Total
AMSH	0.3	1.1	0.3	1.7
AMPK	0.6	1.8	0.5	2.9
MD	2.3	3.8	1.1	7.2
PMSH	1.3	1.9	0.6	3.8
PMPK	2.1	4.4	1.4	7.9
Total	6.5	13.0	3.9	23.4

Box Number: 10

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.2	0.1	0.3
AMPK	0.1	0.3	0.1	0.5
MD	0.4	1.0	0.3	1.7
PMSH	0.4	0.5	0.1	1.0
PMPK	0.5	0.9	0.3	1.6
Total	1.4	2.8	0.9	5.1

Box Number: 11

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.1	0.0	0.2
AMPK	0.0	0.2	0.0	0.3
MD	0.1	0.6	0.1	0.8
PMSH	0.0	0.3	0.1	0.4
PMPK	0.2	0.7	0.2	1.0
Total	0.3	1.9	0.5	2.7

Box Number: 12

	SOV	HOV2	HOV3+	Total
AMSH	0.3	1.2	0.4	1.8
AMPK	0.7	1.8	0.6	3.0
MD	2.7	4.2	1.3	8.1
PMSH	1.7	2.1	0.6	4.4
PMPK	2.4	4.7	1.4	8.4
Total	7.6	14.0	4.2	25.8

Box Number: 13

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.6	0.2	0.8
AMPK	0.0	0.9	0.3	1.2
MD	0.1	1.5	0.5	2.2
PMSH	0.3	0.4	0.2	0.9
PMPK	0.5	0.7	0.3	1.5
Total	1.0	4.1	1.5	6.6

Box Number: 14

	SOV	HOV2	HOV3+	Total
AMSH	0.3	0.6	0.1	1.0
AMPK	0.6	1.0	0.2	1.8
MD	2.5	2.7	0.7	5.9
PMSH	1.4	1.7	0.4	3.6
PMPK	1.8	3.9	1.1	6.9
Total	6.6	9.9	2.7	19.2

Box Number: 15

	SOV	HOV2	HOV3+	Total
AMSH	0.3	0.7	0.2	1.2
AMPK	0.2	0.9	0.3	1.4
MD	0.1	1.0	0.3	1.4
PMSH	0.1	0.2	0.1	0.4
PMPK	0.2	0.6	0.2	1.0
Total	0.9	3.3	1.1	5.3

Box Number: 16

	SOV	HOV2	HOV3+	Total
AMSH	2.2	2.6	0.8	5.6
AMPK	1.6	3.6	1.2	6.4
MD	2.5	3.7	1.2	7.3
PMSH	1.2	1.2	0.3	2.7
PMPK	3.4	3.0	0.9	7.3
Total	10.8	14.0	4.5	29.2

Box Number: 17

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.4	0.1	0.6
AMPK	0.0	0.8	0.3	1.1
MD	0.1	1.0	0.3	1.3
PMSH	0.0	0.4	0.1	0.5
PMPK	0.1	0.8	0.3	1.2
Total	0.3	3.4	1.1	4.8

Box Number: 18

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.5	0.2	0.7
AMPK	0.0	0.8	0.3	1.1
MD	0.0	1.4	0.5	1.8
PMSH	0.0	0.5	0.2	0.7
PMPK	0.0	1.0	0.3	1.4
Total	0.1	4.1	1.4	5.6

Box Number: 19

	SOV	HOV2	HOV3+	Total
AMSH	2.2	2.6	0.9	5.7
AMPK	1.6	3.6	1.2	6.4
MD	2.4	4.1	1.3	7.8
PMSH	1.1	1.3	0.4	2.8
PMPK	3.3	3.1	1.0	7.4
Total	10.6	14.7	4.8	30.1

Box Number: 20

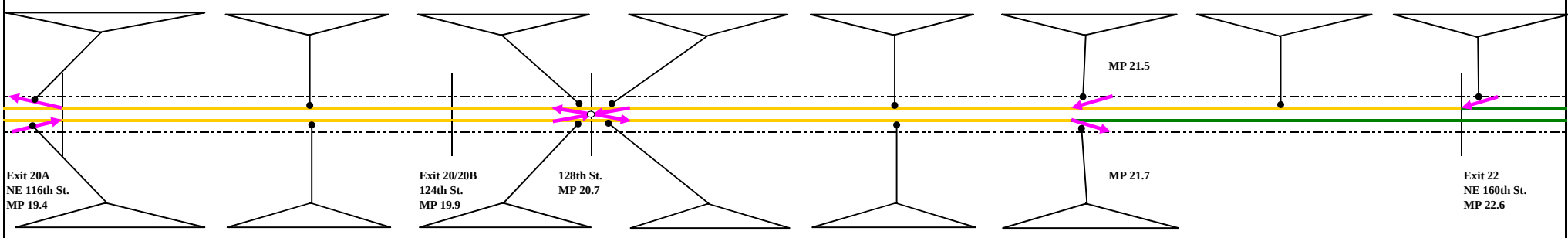
	SOV	HOV2	HOV3+	Total
AMSH	0.1	0.2	0.1	0.3
AMPK	0.1	0.3	0.1	0.4
MD	0.1	0.2	0.1	0.4
PMSH	0.1	0.1	0.0	0.3
PMPK	0.2	0.3	0.1	0.6
Total	0.6	1.1	0.4	2.1

Box Number: 21

	SOV	HOV2	HOV3+	Total
AMSH	2.1	2.5	0.8	5.4
AMPK	1.5	3.3	1.2	5.9
MD	2.3	3.9	1.3	7.4
PMSH	1.1	1.2	0.3	2.6
PMPK	3.1	2.8	0.9	6.8
Total	10.1	13.6	4.4	28.0

Box Number: 22

	SOV	HOV2	HOV3+	Total
AMSH	1.2	0.8	0.3	2.3
AMPK	1.0	1.4	0.5	2.9
MD	1.5	0.8	0.3	2.6
PMSH	0.6	0.3	0.1	1.0
PMPK	1.5	0.8	0.2	2.6
Total	5.8	4.1	1.4	11.3



Box Number: 23

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.1	0.0	0.1
AMPK	0.1	0.1	0.0	0.2
MD	0.2	0.5	0.1	0.8
PMSH	0.0	0.5	0.2	0.7
PMPK	0.1	1.3	0.5	1.9
Total	0.5	2.5	0.8	3.8

Box Number: 24

	SOV	HOV2	HOV3+	Total
AMSH	0.3	0.7	0.2	1.1
AMPK	0.7	1.0	0.3	2.1
MD	2.7	3.1	0.9	6.8
PMSH	1.4	2.2	0.6	4.3
PMPK	1.9	5.3	1.6	8.8
Total	7.1	12.3	3.5	23.0

Box Number: 25

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.2	0.1	0.3
AMPK	0.0	0.2	0.1	0.3
MD	0.0	1.2	0.4	1.7
PMSH	0.1	0.7	0.2	1.0
PMPK	0.1	1.7	0.5	2.3
Total	0.2	4.0	1.3	5.5

Box Number: 26

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.3	0.1	0.3
AMPK	0.0	0.3	0.1	0.4
MD	0.0	1.1	0.4	1.5
PMSH	0.0	0.6	0.2	0.8
PMPK	0.0	1.5	0.5	2.1
Total	0.1	3.7	1.3	5.1

Box Number: 27

	SOV	HOV2	HOV3+	Total
AMSH	0.3	0.7	0.2	1.2
AMPK	0.8	1.1	0.3	2.2
MD	2.7	3.0	0.9	6.6
PMSH	1.3	2.1	0.6	4.0
PMPK	1.8	5.1	1.6	8.5
Total	7.0	12.1	3.5	22.6

Box Number: 28

	SOV	HOV2	HOV3+	Total
AMSH	0.1	0.2	0.1	0.4
AMPK	0.1	0.3	0.1	0.5
MD	0.9	1.4	0.4	2.6
PMSH	0.7	1.0	0.3	1.9
PMPK	1.1	2.3	0.8	4.2
Total	2.8	5.2	1.6	9.6

Box Number: 29

	SOV	HOV2	HOV3+	Total
AMSH	0.9	1.7	0.5	3.1
AMPK	0.5	1.9	0.7	3.0
MD	0.8	3.0	1.0	4.8
PMSH	0.5	0.8	0.2	1.6
PMPK	1.6	2.0	0.6	4.2
Total	4.2	9.4	3.0	16.7

Box Number: 30

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.2	0.1	0.3
AMPK	0.0	0.2	0.1	0.3
MD	0.1	0.5	0.2	0.7
PMSH	0.0	0.1	0.0	0.2
PMPK	0.1	0.3	0.1	0.5
Total	0.3	1.3	0.5	2.1

Box Number: 31

	SOV	HOV2	HOV3+	Total
AMSH	0.2	0.5	0.2	0.8
AMPK	0.0	0.6	0.2	0.8
MD	0.2	0.7	0.2	1.2
PMSH	0.1	0.3	0.1	0.5
PMPK	0.2	0.6	0.2	1.0
Total	0.8	2.6	0.9	4.3

Box Number: 32

	SOV	HOV2	HOV3+	Total
AMSH	0.7	1.4	0.5	2.6
AMPK	0.4	1.5	0.5	2.5
MD	0.7	2.8	0.9	4.4
PMSH	0.4	0.7	0.2	1.3
PMPK	1.5	1.7	0.6	3.8
Total	3.8	8.2	2.6	14.5

Box Number: 33

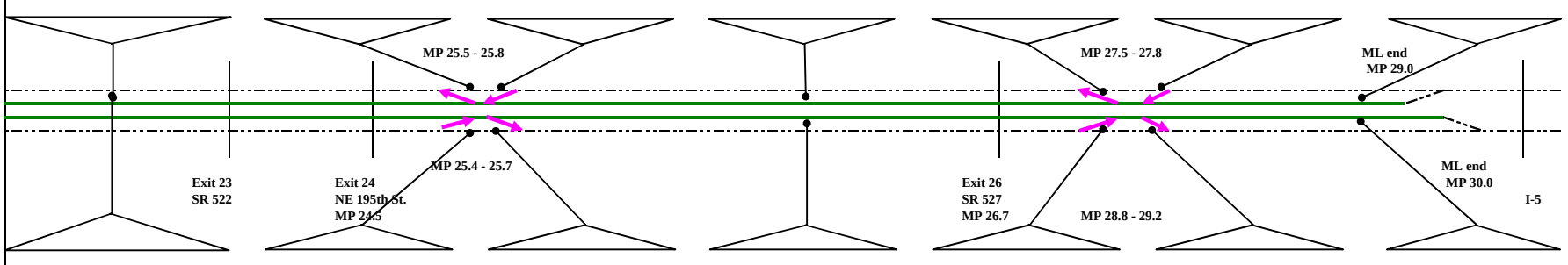
	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.2	0.1	0.3
AMPK	0.0	0.4	0.2	0.6
MD	0.1	0.3	0.2	0.6
PMSH	0.0	0.1	0.0	0.2
PMPK	0.1	0.2	0.1	0.4
Total	0.2	1.3	0.5	2.0

Box Number: 34

	SOV	HOV2	HOV3+	Total
AMSH	0.2	0.2	0.1	0.5
AMPK	0.0	0.0	0.0	0.0
MD	0.3	0.5	0.1	0.9
PMSH	0.2	0.2	0.0	0.4
PMPK	0.6	0.4	0.1	1.1
Total	1.3	1.3	0.3	2.9

Box Number: 35

	SOV	HOV2	HOV3+	Total
AMSH	0.5	1.4	0.5	2.4
AMPK	0.5	1.9	0.7	3.1
MD	0.5	2.6	0.9	4.0
PMSH	0.3	0.6	0.2	1.1
PMPK	1.0	1.6	0.6	3.1
Total	2.7	8.1	2.9	13.7



Box Number: 36

	SOV	HOV2	HOV3+	Total
AMSH	0.2	0.5	0.1	0.8
AMPK	0.7	0.8	0.2	1.7
MD	1.8	1.7	0.5	4.0
PMSH	0.7	1.1	0.3	2.1
PMPK	0.7	2.8	0.8	4.4
Total	4.2	6.9	1.9	13.0

Box Number: 37

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.1	0.0	0.2
AMPK	0.2	0.3	0.1	0.6
MD	0.1	0.3	0.1	0.5
PMSH	0.1	0.2	0.1	0.4
PMPK	0.1	0.4	0.2	0.7
Total	0.5	1.4	0.5	2.4

Box Number: 38

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.1	0.0	0.2
AMPK	0.0	0.1	0.0	0.2
MD	0.3	0.7	0.2	1.3
PMSH	0.1	0.4	0.1	0.7
PMPK	0.1	1.0	0.3	1.4
Total	0.6	2.4	0.7	3.7

Box Number: 39

	SOV	HOV2	HOV3+	Total
AMSH	0.2	0.5	0.1	0.9
AMPK	0.9	1.0	0.3	2.1
MD	1.7	1.2	0.3	3.2
PMSH	0.6	1.0	0.3	1.8
PMPK	0.7	2.2	0.7	3.7
Total	4.1	5.9	1.7	11.7

Box Number: 40

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.0	0.0	0.1
AMPK	0.0	0.0	0.0	0.1
MD	0.0	0.1	0.0	0.1
PMSH	0.0	0.0	0.0	0.1
PMPK	0.0	0.3	0.2	0.6
Total	0.1	0.5	0.3	0.9

Box Number: 41

	SOV	HOV2	HOV3+	Total
AMSH	0.1	0.2	0.0	0.3
AMPK	0.3	0.4	0.1	0.9
MD	0.6	0.7	0.2	1.6
PMSH	0.2	0.5	0.0	0.8
PMPK	0.2	1.2	0.1	1.6
Total	1.5	3.1	0.5	5.2

Box Number: 42

	SOV	HOV2	HOV3+	Total
AMSH	0.2	0.4	0.1	0.6
AMPK	0.6	0.6	0.1	1.3
MD	1.1	0.6	0.1	1.8
PMSH	0.4	0.5	0.2	1.1
PMPK	0.5	1.3	0.8	2.7
Total	2.7	3.3	1.5	7.5

LEGEND

1 Express Toll Lane

2 Express Toll Lanes

High Occupancy Vehicle (HOV) Lane

General Purpose (GP) Lane

0.0 Weekday Express Toll Lane Traffic Volumes

AMSH (AM Shoulder) 5:00-6:30 a.m., 8:30-9:30 a.m

AMPK (AM Peak) 6:30-8:30 a.m.

MD (Midday) 9:30 a.m.-2:30 p.m.

PMSH (PM Shoulder) 2:30-3:30 p.m., 6:30-7:00 p.m.

PMPK (PM Peak) 3:30-6:30 p.m.

Total Weekday Express Toll Lane Traffic Volume) 5:00 a.m.-7:00 p.m

SOV (Single Occupant Vehicle)

HOV (High Occupancy Vehicle)

HOV 2 (HOV with two occupants)

HOV 3+ (HOV with three or more occupants)

NOTE: All volumes shown represent thousands of vehicles.

Figure D-3

Estimated 2020 Average Weekday Mainline and Ingress/Egress Express Toll Lane Traffic Volumes

Box Number: 1

	SOV	HOV2	HOV3+	Total
AMSH	1.7	0.3	0.1	2.0
AMPK	1.4	0.1	0.0	1.6
MD	3.1	0.0	0.0	3.1
PMSH	1.3	0.0	0.0	1.3
PMPK	3.1	0.0	0.0	3.1
Total	10.6	0.4	0.1	11.0

Box Number: 2

	SOV	HOV2	HOV3+	Total
AMSH	1.7	1.6	0.5	3.8
AMPK	1.4	2.4	0.8	4.6
MD	3.1	2.4	0.7	6.2
PMSH	1.3	0.9	0.2	2.3
PMPK	3.1	2.0	0.5	5.6
Total	10.6	9.3	2.7	22.6

Box Number: 3

	SOV	HOV2	HOV3+	Total
AMSH	0.8	0.7	0.2	1.7
AMPK	0.6	0.8	0.3	1.7
MD	1.1	0.9	0.4	2.4
PMSH	0.5	0.4	0.1	1.0
PMPK	1.4	1.0	0.3	2.7
Total	4.4	3.7	1.3	9.4

Box Number: 4

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.1	0.0	0.2
AMPK	0.0	0.2	0.1	0.3
MD	0.1	0.1	0.0	0.2
PMSH	0.0	0.1	0.0	0.2
PMPK	0.1	0.2	0.0	0.3
Total	0.3	0.7	0.2	1.1

Box Number: 5

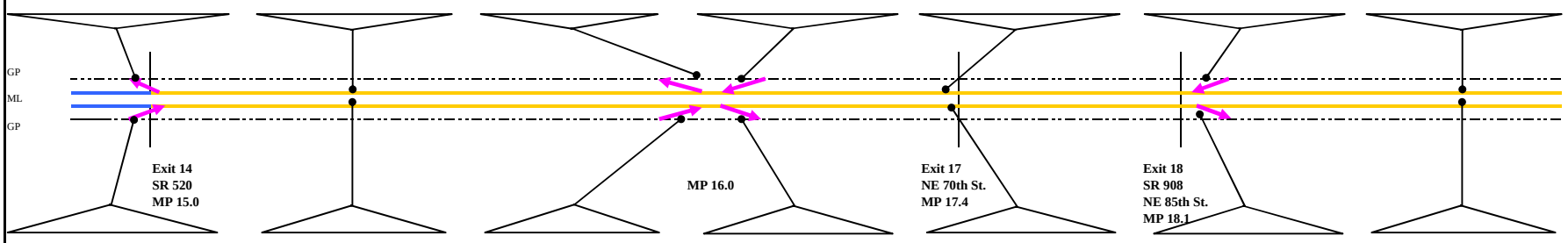
	SOV	HOV2	HOV3+	Total
AMSH	2.4	2.2	0.7	5.3
AMPK	2.0	3.0	1.0	6.0
MD	4.1	3.2	1.1	8.4
PMSH	1.8	1.1	0.3	3.2
PMPK	4.5	2.8	0.8	8.0
Total	14.7	12.3	3.8	30.9

Box Number: 6

	SOV	HOV2	HOV3+	Total
AMSH	0.2	0.2	0.1	0.4
AMPK	0.6	0.3	0.1	1.0
MD	0.3	0.2	0.1	0.5
PMSH	0.2	0.1	0.0	0.3
PMPK	0.8	0.3	0.1	1.1
Total	2.0	1.0	0.3	3.4

Box Number: 7

	SOV	HOV2	HOV3+	Total
AMSH	2.2	2.0	0.6	4.9
AMPK	1.4	2.7	0.9	5.0
MD	3.8	3.1	1.0	7.8
PMSH	1.6	1.0	0.3	2.9
PMPK	3.7	2.5	0.7	6.9
Total	12.7	11.3	3.5	27.5



Box Number: 8

	SOV	HOV2	HOV3+	Total
AMSH	0.4	0.3	0.1	0.7
AMPK	0.9	0.3	0.1	1.3
MD	3.7	0.0	0.0	3.7
PMSH	1.3	0.4	0.1	1.7
PMPK	1.9	0.5	0.2	2.6
Total	8.1	1.4	0.4	10.0

Box Number: 9

	SOV	HOV2	HOV3+	Total
AMSH	0.4	1.2	0.3	1.9
AMPK	0.9	1.8	0.5	3.2
MD	3.7	4.1	1.2	8.9
PMSH	1.3	2.1	0.6	4.0
PMPK	1.9	4.8	1.4	8.1
Total	8.1	13.9	4.1	26.1

Box Number: 10

	SOV	HOV2	HOV3+	Total
AMSH	0.1	0.2	0.1	0.3
AMPK	0.2	0.3	0.1	0.5
MD	0.6	0.9	0.3	1.8
PMSH	0.4	0.5	0.2	1.0
PMPK	0.5	1.0	0.3	1.8
Total	1.6	3.0	0.9	5.5

Box Number: 11

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.1	0.0	0.2
AMPK	0.0	0.2	0.0	0.3
MD	0.1	0.6	0.1	0.8
PMSH	0.0	0.3	0.1	0.4
PMPK	0.2	0.6	0.2	1.1
Total	0.3	1.8	0.5	2.6

Box Number: 12

	SOV	HOV2	HOV3+	Total
AMSH	0.5	1.3	0.4	2.1
AMPK	1.0	1.9	0.6	3.5
MD	4.2	4.4	1.4	10.0
PMSH	1.6	2.3	0.7	4.6
PMPK	2.2	5.2	1.5	8.8
Total	9.4	15.1	4.4	29.0

Box Number: 13

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.6	0.2	0.8
AMPK	0.0	0.9	0.3	1.2
MD	0.1	1.6	0.6	2.3
PMSH	0.3	0.4	0.2	0.9
PMPK	0.8	0.8	0.3	1.8
Total	1.3	4.2	1.5	7.0

Box Number: 14

	SOV	HOV2	HOV3+	Total
AMSH	0.4	0.7	0.2	1.3
AMPK	1.0	1.0	0.2	2.3
MD	4.0	2.9	0.8	7.7
PMSH	1.3	1.9	0.5	3.7
PMPK	1.4	4.4	1.2	7.0
Total	8.2	10.9	2.9	21.9

Box Number: 15

	SOV	HOV2	HOV3+	Total
AMSH	0.3	0.7	0.2	1.2
AMPK	0.2	0.9	0.3	1.4
MD	0.1	1.0	0.3	1.4
PMSH	0.1	0.2	0.1	0.4
PMPK	0.2	0.6	0.2	1.0
Total	0.9	3.3	1.1	5.4

Box Number: 16

	SOV	HOV2	HOV3+	Total
AMSH	2.5	2.7	0.9	6.1
AMPK	1.6	3.6	1.2	6.4
MD	3.9	4.0	1.3	9.3
PMSH	1.6	1.3	0.3	3.3
PMPK	3.9	3.1	0.9	7.9
Total	13.6	14.7	4.6	32.9

Box Number: 17

	SOV	HOV2	HOV3+	Total
AMSH	0.1	0.5	0.2	0.7
AMPK	0.0	0.8	0.3	1.1
MD	0.2	1.1	0.4	1.6
PMSH	0.0	0.4	0.1	0.6
PMPK	0.1	0.9	0.3	1.3
Total	0.4	3.8	1.2	5.3

Box Number: 18

	SOV	HOV2	HOV3+	Total
AMSH	0.1	0.5	0.2	0.8
AMPK	0.0	0.8	0.3	1.2
MD	0.0	1.4	0.5	1.9
PMSH	0.0	0.5	0.2	0.7
PMPK	0.0	1.0	0.3	1.4
Total	0.1	4.4	1.5	5.9

Box Number: 19

	SOV	HOV2	HOV3+	Total
AMSH	2.5	2.8	0.9	6.2
AMPK	1.6	3.6	1.2	6.4
MD	3.8	4.4	1.4	9.6
PMSH	1.6	1.4	0.4	3.4
PMPK	3.8	3.2	1.0	7.9
Total	13.3	15.3	4.9	33.5

Box Number: 20

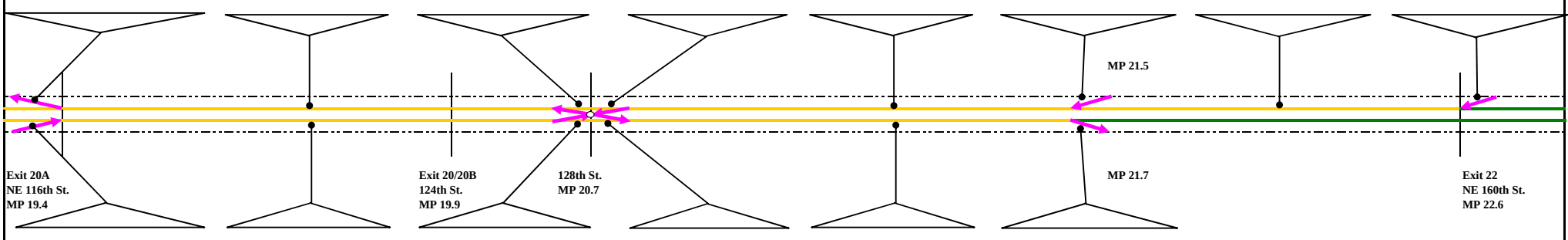
	SOV	HOV2	HOV3+	Total
AMSH	0.1	0.2	0.1	0.4
AMPK	0.1	0.3	0.1	0.4
MD	0.2	0.2	0.1	0.5
PMSH	0.1	0.1	0.1	0.3
PMPK	0.2	0.3	0.1	0.6
Total	0.7	1.1	0.4	2.1

Box Number: 21

	SOV	HOV2	HOV3+	Total
AMSH	2.3	2.6	0.8	5.8
AMPK	1.5	3.3	1.2	6.0
MD	3.6	4.1	1.3	9.1
PMSH	1.5	1.2	0.3	3.1
PMPK	3.6	2.9	0.9	7.4
Total	12.6	14.2	4.6	31.4

Box Number: 22

	SOV	HOV2	HOV3+	Total
AMSH	1.5	0.9	0.3	2.7
AMPK	1.1	1.5	0.5	3.1
MD	2.0	0.9	0.3	3.2
PMSH	0.8	0.4	0.1	1.2
PMPK	1.8	0.9	0.3	2.9
Total	7.3	4.4	1.4	13.1



Box Number: 23

	SOV	HOV2	HOV3+	Total
AMSH	0.1	0.1	0.0	0.2
AMPK	0.2	0.1	0.0	0.2
MD	0.2	0.5	0.1	0.8
PMSH	0.0	0.5	0.2	0.7
PMPK	0.1	1.1	0.4	1.6
Total	0.5	2.3	0.8	3.6

Box Number: 24

	SOV	HOV2	HOV3+	Total
AMSH	0.5	0.8	0.2	1.4
AMPK	1.1	1.1	0.3	2.5
MD	4.2	3.4	0.9	8.5
PMSH	1.4	2.4	0.7	4.4
PMPK	1.5	5.6	1.6	8.6
Total	8.7	13.2	3.7	25.5

Box Number: 25

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.2	0.1	0.3
AMPK	0.0	0.2	0.1	0.3
MD	0.0	1.3	0.4	1.7
PMSH	0.1	0.7	0.2	1.0
PMPK	0.1	1.5	0.5	2.1
Total	0.2	4.0	1.3	5.5

Box Number: 26

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.3	0.1	0.4
AMPK	0.0	0.3	0.1	0.4
MD	0.0	1.1	0.4	1.4
PMSH	0.0	0.6	0.2	0.8
PMPK	0.0	1.8	0.6	2.5
Total	0.1	4.0	1.4	5.5

Box Number: 27

	SOV	HOV2	HOV3+	Total
AMSH	0.5	0.8	0.2	1.5
AMPK	1.2	1.2	0.3	2.7
MD	4.2	3.1	0.9	8.2
PMSH	1.3	2.3	0.6	4.2
PMPK	1.4	5.8	1.7	9.0
Total	8.6	13.2	3.7	25.5

Box Number: 28

	SOV	HOV2	HOV3+	Total
AMSH	0.1	0.3	0.1	0.4
AMPK	0.1	0.3	0.1	0.5
MD	1.3	1.4	0.4	3.0
PMSH	0.7	1.1	0.3	2.1
PMPK	1.0	2.8	0.9	4.6
Total	3.1	5.8	1.7	10.7

Box Number: 29

	SOV	HOV2	HOV3+	Total
AMSH	0.8	1.8	0.6	3.1
AMPK	0.4	1.9	0.6	2.9
MD	1.6	3.3	1.1	5.9
PMSH	0.8	0.9	0.2	1.9
PMPK	1.8	2.0	0.6	4.4
Total	5.4	9.8	3.1	18.3

Box Number: 30

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.2	0.1	0.4
AMPK	0.0	0.2	0.1	0.3
MD	0.1	0.5	0.2	0.8
PMSH	0.0	0.2	0.0	0.2
PMPK	0.2	0.3	0.1	0.6
Total	0.4	1.5	0.5	2.3

Box Number: 31

	SOV	HOV2	HOV3+	Total
AMSH	0.2	0.5	0.2	0.8
AMPK	0.0	0.6	0.2	0.9
MD	0.4	0.8	0.3	1.4
PMSH	0.2	0.3	0.1	0.5
PMPK	0.2	0.6	0.2	1.0
Total	1.0	2.7	0.9	4.6

Box Number: 32

	SOV	HOV2	HOV3+	Total
AMSH	0.7	1.5	0.5	2.7
AMPK	0.4	1.4	0.5	2.3
MD	1.3	3.0	1.0	5.3
PMSH	0.6	0.8	0.2	1.6
PMPK	1.8	1.8	0.6	4.1
Total	4.8	8.5	2.7	16.0

Box Number: 33

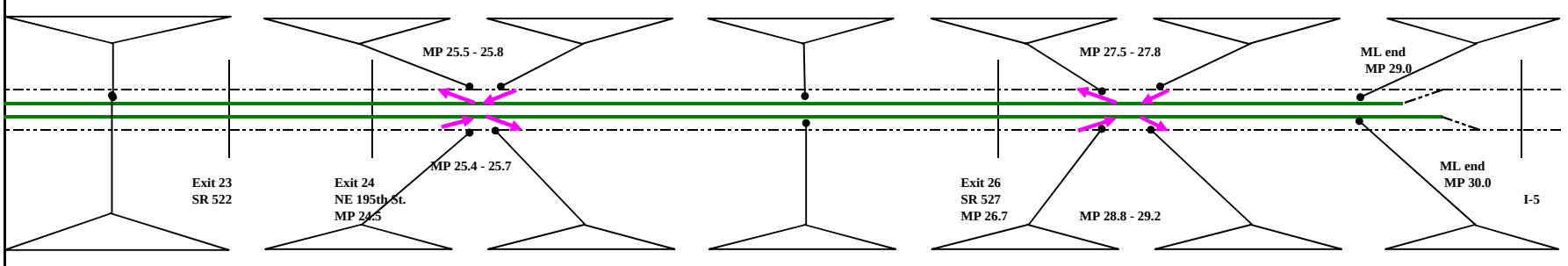
	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.2	0.1	0.3
AMPK	0.0	0.4	0.1	0.6
MD	0.1	0.3	0.1	0.5
PMSH	0.0	0.1	0.0	0.2
PMPK	0.1	0.3	0.1	0.4
Total	0.2	1.3	0.5	2.0

Box Number: 34

	SOV	HOV2	HOV3+	Total
AMSH	0.2	0.3	0.1	0.5
AMPK	0.0	0.0	0.0	0.0
MD	0.5	0.5	0.2	1.2
PMSH	0.3	0.2	0.0	0.5
PMPK	0.6	0.4	0.0	1.1
Total	1.6	1.4	0.3	3.3

Box Number: 35

	SOV	HOV2	HOV3+	Total
AMSH	0.5	1.5	0.5	2.5
AMPK	0.4	1.8	0.6	2.9
MD	0.9	2.8	1.0	4.7
PMSH	0.4	0.7	0.2	1.3
PMPK	1.2	1.6	0.7	3.4
Total	3.4	8.4	3.0	14.7



Box Number: 36

	SOV	HOV2	HOV3+	Total
AMSH	0.4	0.5	0.1	1.1
AMPK	1.1	0.8	0.2	2.2
MD	2.9	1.8	0.5	5.1
PMSH	0.6	1.2	0.3	2.1
PMPK	0.4	3.0	0.9	4.4
Total	5.5	7.4	2.0	14.9

Box Number: 37

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.1	0.0	0.2
AMPK	0.3	0.3	0.1	0.6
MD	0.1	0.4	0.1	0.6
PMSH	0.1	0.2	0.1	0.4
PMPK	0.1	0.4	0.2	0.6
Total	0.5	1.4	0.5	2.5

Box Number: 38

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.1	0.0	0.2
AMPK	0.1	0.1	0.0	0.3
MD	0.4	0.7	0.2	1.4
PMSH	0.1	0.4	0.1	0.7
PMPK	0.1	1.1	0.3	1.5
Total	0.8	2.6	0.7	4.1

Box Number: 39

	SOV	HOV2	HOV3+	Total
AMSH	0.4	0.5	0.1	1.1
AMPK	1.3	1.0	0.3	2.6
MD	2.6	1.4	0.4	4.4
PMSH	0.6	1.0	0.3	1.8
PMPK	0.4	2.3	0.7	3.4
Total	5.2	6.2	1.8	13.2

Box Number: 40

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.1	0.0	0.1
AMPK	0.0	0.1	0.0	0.1
MD	0.1	0.1	0.0	0.2
PMSH	0.0	0.1	0.0	0.1
PMPK	0.0	0.4	0.2	0.6
Total	0.2	0.6	0.3	1.1

Box Number: 41

	SOV	HOV2	HOV3+	Total
AMSH	0.2	0.2	0.1	0.4
AMPK	0.4	0.4	0.1	0.9
MD	0.9	0.8	0.2	2.0
PMSH	0.2	0.5	0.0	0.8
PMPK	0.1	1.2	0.0	1.4
Total	1.8	3.3	0.4	5.5

Box Number: 42

	SOV	HOV2	HOV3+	Total
AMSH	0.2	0.4	0.1	0.7
AMPK	0.9	0.6	0.2	1.7
MD	1.7	0.7	0.2	2.5
PMSH	0.4	0.5	0.3	1.1
PMPK	0.3	1.4	0.9	2.6
Total	3.6	3.6	1.6	8.8

LEGEND

1 Express Toll Lane

2 Express Toll Lanes

High Occupancy Vehicle (HOV) Lane

General Purpose (GP) Lane

0.0 Weekday Express Toll Lane Traffic Volumes

AMSH (AM Shoulder) 5:00-6:30 a.m., 8:30-9:30 a.m

AMPK (AM Peak) 6:30-8:30 a.m.

MD (Midday) 9:30 a.m.-2:30 p.m.

PMSH (PM Shoulder) 2:30-3:30 p.m., 6:30-7:00 p.m.

PMPK (PM Peak) 3:30-6:30 p.m.

Total Weekday Express Toll Lane Traffic Volume) 5:00 a.m.-7:00 p.m

SOV (Single Occupant Vehicle)

HOV (High Occupancy Vehicle)

HOV 2 (HOV with two occupants)

HOV 3+ (HOV with three or more occupants)

NOTE: All volumes shown represent thousands of vehicles.

Figure D-4

Estimated 2030 Average Weekday Mainline and Ingress/Egress Express Toll Lane Traffic Volumes

Box Number: 1

	SOV	HOV2	HOV3+	Total
AMSH	1.7	0.2	0.1	2.0
AMPK	1.4	0.4	0.1	2.0
MD	4.2	0.0	0.0	4.2
PMSH	1.8	0.0	0.0	1.8
PMPK	3.3	0.0	0.0	3.3
Total	12.4	0.7	0.2	13.3

Box Number: 2

	SOV	HOV2	HOV3+	Total
AMSH	1.7	1.9	0.6	4.2
AMPK	1.4	2.5	0.7	4.7
MD	4.2	2.9	1.1	8.2
PMSH	1.8	1.2	0.2	3.3
PMPK	3.3	2.5	0.8	6.6
Total	12.4	11.1	3.4	26.9

Box Number: 3

	SOV	HOV2	HOV3+	Total
AMSH	0.8	0.8	0.3	1.8
AMPK	0.6	0.8	0.3	1.7
MD	1.6	1.1	0.5	3.2
PMSH	0.8	0.4	0.1	1.4
PMPK	1.5	1.1	0.4	3.1
Total	5.3	4.3	1.6	11.1

Box Number: 4

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.1	0.0	0.2
AMPK	0.0	0.2	0.1	0.3
MD	0.1	0.2	0.1	0.4
PMSH	0.0	0.3	0.0	0.4
PMPK	0.1	0.2	0.1	0.3
Total	0.3	1.0	0.3	1.6

Box Number: 5

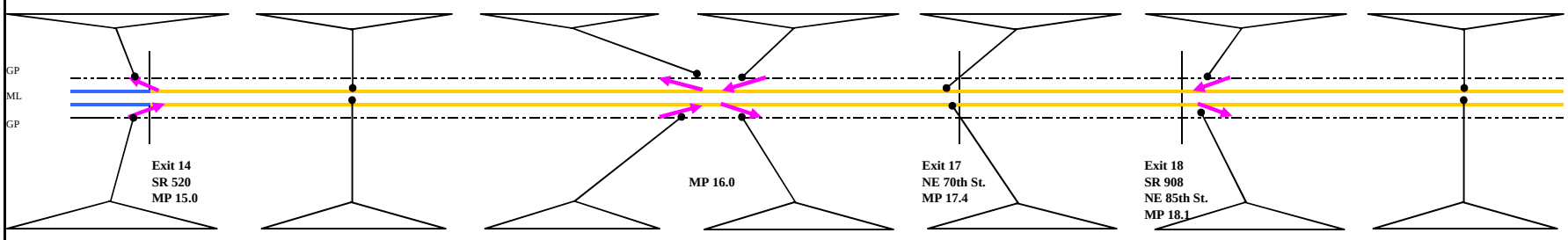
	SOV	HOV2	HOV3+	Total
AMSH	2.4	2.5	0.8	5.8
AMPK	2.0	3.1	1.0	6.0
MD	5.7	3.8	1.5	11.1
PMSH	2.6	1.4	0.3	4.3
PMPK	4.8	3.4	1.1	9.3
Total	17.5	14.3	4.6	36.4

Box Number: 6

	SOV	HOV2	HOV3+	Total
AMSH	0.4	0.2	0.1	0.7
AMPK	0.6	0.4	0.1	1.0
MD	0.2	0.2	0.1	0.5
PMSH	0.4	0.1	0.0	0.6
PMPK	0.9	0.3	0.1	1.3
Total	2.4	1.2	0.4	4.1

Box Number: 7

	SOV	HOV2	HOV3+	Total
AMSH	2.1	2.3	0.7	5.1
AMPK	1.4	2.8	0.8	5.0
MD	5.5	3.7	1.4	10.6
PMSH	2.2	1.2	0.3	3.7
PMPK	3.9	3.1	1.0	8.0
Total	15.0	13.1	4.2	32.3



Box Number: 8

	SOV	HOV2	HOV3+	Total
AMSH	0.5	0.3	0.1	1.0
AMPK	1.1	0.4	0.1	1.5
MD	3.9	0.0	0.0	3.9
PMSH	1.1	0.5	0.1	1.7
PMPK	1.3	1.2	0.4	2.9
Total	7.9	2.4	0.7	11.0

Box Number: 9

	SOV	HOV2	HOV3+	Total
AMSH	0.5	1.4	0.4	2.3
AMPK	1.1	2.0	0.5	3.6
MD	3.9	4.7	1.6	10.3
PMSH	1.1	2.5	0.6	4.3
PMPK	1.3	5.6	1.7	8.6
Total	7.9	16.3	4.8	29.0

Box Number: 10

	SOV	HOV2	HOV3+	Total
AMSH	0.1	0.2	0.1	0.4
AMPK	0.2	0.3	0.1	0.5
MD	0.5	0.8	0.3	1.5
PMSH	0.2	0.4	0.2	0.8
PMPK	0.3	1.1	0.3	1.7
Total	1.3	2.8	0.8	4.9

Box Number: 11

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.1	0.0	0.2
AMPK	0.0	0.2	0.0	0.3
MD	0.1	0.6	0.2	0.9
PMSH	0.0	0.3	0.1	0.4
PMPK	0.1	0.7	0.3	1.1
Total	0.2	2.0	0.6	2.8

Box Number: 12

	SOV	HOV2	HOV3+	Total
AMSH	0.6	1.5	0.4	2.5
AMPK	1.2	2.0	0.5	3.8
MD	4.3	4.9	1.7	10.9
PMSH	1.4	2.6	0.7	4.7
PMPK	1.5	6.0	1.7	9.2
Total	8.9	17.1	5.1	31.1

Box Number: 13

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.6	0.2	0.9
AMPK	0.0	0.9	0.3	1.2
MD	0.1	1.6	0.7	2.4
PMSH	0.3	0.5	0.2	0.9
PMPK	0.5	1.0	0.4	1.9
Total	1.0	4.7	1.7	7.4

Box Number: 14

	SOV	HOV2	HOV3+	Total
AMSH	0.5	0.9	0.2	1.6
AMPK	1.2	1.2	0.2	2.6
MD	4.2	3.3	1.0	8.5
PMSH	1.1	2.2	0.5	3.8
PMPK	1.0	5.0	1.3	7.3
Total	7.9	12.4	3.4	23.7

Box Number: 15

	SOV	HOV2	HOV3+	Total
AMSH	0.3	0.7	0.3	1.3
AMPK	0.2	0.8	0.3	1.2
MD	0.1	1.1	0.4	1.6
PMSH	0.2	0.3	0.1	0.6
PMPK	0.3	0.7	0.2	1.2
Total	1.1	3.6	1.2	5.9

Box Number: 16

	SOV	HOV2	HOV3+	Total
AMSH	2.3	3.1	1.0	6.4
AMPK	1.6	3.5	1.1	6.2
MD	5.7	4.8	1.8	12.2
PMSH	2.4	1.5	0.4	4.3
PMPK	4.2	3.8	1.2	9.2
Total	16.1	16.7	5.5	38.3

Box Number: 17

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.5	0.2	0.7
AMPK	0.0	0.8	0.2	1.0
MD	0.3	1.5	0.5	2.3
PMSH	0.0	0.5	0.2	0.7
PMPK	0.3	1.2	0.4	1.8
Total	0.7	4.4	1.4	6.6

Box Number: 18

	SOV	HOV2	HOV3+	Total
AMSH	0.1	0.6	0.2	0.9
AMPK	0.0	0.9	0.3	1.3
MD	0.0	1.3	0.4	1.8
PMSH	0.0	0.6	0.2	0.8
PMPK	0.1	1.0	0.3	1.4
Total	0.2	4.4	1.5	6.2

Box Number: 19

	SOV	HOV2	HOV3+	Total
AMSH	2.4	3.1	1.0	6.5
AMPK	1.6	3.7	1.2	6.5
MD	5.4	4.6	1.7	11.7
PMSH	2.4	1.6	0.4	4.4
PMPK	3.9	3.6	1.2	8.8
Total	15.6	16.7	5.5	37.8

Box Number: 20

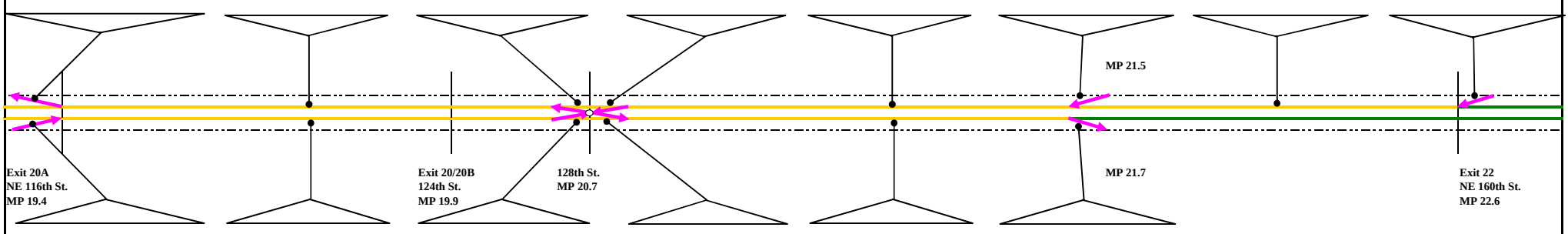
	SOV	HOV2	HOV3+	Total
AMSH	0.1	0.2	0.1	0.5
AMPK	0.1	0.4	0.1	0.6
MD	0.2	0.2	0.1	0.6
PMSH	0.1	0.2	0.1	0.4
PMPK	0.2	0.3	0.1	0.6
Total	0.8	1.3	0.4	2.6

Box Number: 21

	SOV	HOV2	HOV3+	Total
AMSH	2.2	2.9	0.9	6.1
AMPK	1.5	3.3	1.1	5.9
MD	5.1	4.4	1.6	11.1
PMSH	2.3	1.4	0.4	4.0
PMPK	3.7	3.3	1.1	8.1
Total	14.8	15.4	5.1	35.3

Box Number: 22

	SOV	HOV2	HOV3+	Total
AMSH	1.4	1.1	0.3	2.8
AMPK	1.0	1.5	0.5	3.0
MD	2.9	1.1	0.5	4.5
PMSH	1.4	0.4	0.1	1.9
PMPK	2.3	1.2	0.4	3.9
Total	9.0	5.3	1.8	16.2



Box Number: 23

	SOV	HOV2	HOV3+	Total
AMSH	0.1	0.1	0.0	0.3
AMPK	0.2	0.1	0.0	0.3
MD	0.2	0.6	0.2	1.0
PMSH	0.0	0.5	0.2	0.7
PMPK	0.1	1.1	0.4	1.6
Total	0.6	2.4	0.8	3.9

Box Number: 24

	SOV	HOV2	HOV3+	Total
AMSH	0.6	1.0	0.2	1.9
AMPK	1.4	1.3	0.3	2.9
MD	4.4	3.9	1.2	9.5
PMSH	1.1	2.7	0.7	4.5
PMPK	1.0	6.1	1.8	8.8
Total	8.5	14.8	4.2	27.6

Box Number: 25

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.3	0.1	0.3
AMPK	0.0	0.2	0.1	0.3
MD	0.0	1.4	0.4	1.8
PMSH	0.1	0.8	0.2	1.1
PMPK	0.1	1.2	0.4	1.7
Total	0.2	3.8	1.2	5.2

Box Number: 26

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.3	0.1	0.4
AMPK	0.1	0.3	0.1	0.5
MD	0.0	1.1	0.4	1.5
PMSH	0.0	0.6	0.2	0.9
PMPK	0.0	1.4	0.5	2.0
Total	0.1	3.8	1.3	5.3

Box Number: 27

	SOV	HOV2	HOV3+	Total
AMSH	0.6	1.1	0.3	2.0
AMPK	1.4	1.4	0.3	3.1
MD	4.4	3.6	1.2	9.2
PMSH	1.0	2.5	0.7	4.3
PMPK	1.0	6.2	1.9	9.1
Total	8.5	14.9	4.3	27.7

Box Number: 28

	SOV	HOV2	HOV3+	Total
AMSH	0.1	0.4	0.1	0.6
AMPK	0.1	0.4	0.1	0.6
MD	1.4	1.5	0.5	3.4
PMSH	0.6	1.2	0.3	2.1
PMPK	0.7	3.1	1.0	4.8
Total	2.8	6.6	2.0	11.5

Box Number: 29

	SOV	HOV2	HOV3+	Total
AMSH	0.8	1.9	0.6	3.3
AMPK	0.4	1.8	0.6	2.9
MD	2.2	3.2	1.1	6.6
PMSH	0.9	1.0	0.2	2.1
PMPK	1.4	2.2	0.7	4.3
Total	5.8	10.0	3.3	19.1

Box Number: 30

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.2	0.1	0.3
AMPK	0.0	0.2	0.1	0.3
MD	0.1	0.7	0.2	0.9
PMSH	0.1	0.2	0.0	0.3
PMPK	0.2	0.3	0.1	0.7
Total	0.4	1.6	0.6	2.6

Box Number: 31

	SOV	HOV2	HOV3+	Total
AMSH	0.2	0.5	0.2	0.9
AMPK	0.1	0.7	0.2	1.0
MD	0.6	0.8	0.3	1.7
PMSH	0.2	0.3	0.1	0.6
PMPK	0.2	0.7	0.2	1.1
Total	1.3	3.1	1.0	5.3

Box Number: 32

	SOV	HOV2	HOV3+	Total
AMSH	0.7	1.6	0.5	2.7
AMPK	0.4	1.3	0.4	2.2
MD	1.7	3.1	1.0	5.8
PMSH	0.7	0.8	0.2	1.8
PMPK	1.4	1.8	0.6	3.9
Total	4.9	8.6	2.8	16.4

Box Number: 33

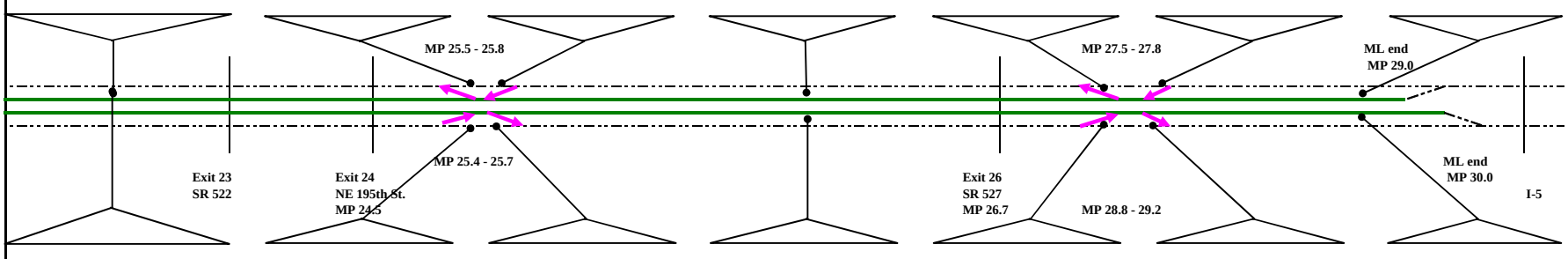
	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.2	0.1	0.4
AMPK	0.0	0.4	0.1	0.6
MD	0.1	0.4	0.2	0.6
PMSH	0.0	0.2	0.1	0.2
PMPK	0.1	0.3	0.2	0.6
Total	0.2	1.5	0.6	2.4

Box Number: 34

	SOV	HOV2	HOV3+	Total
AMSH	0.2	0.3	0.1	0.6
AMPK	0.0	0.1	0.0	0.1
MD	0.6	0.5	0.2	1.3
PMSH	0.3	0.2	0.0	0.5
PMPK	0.6	0.4	0.0	1.0
Total	1.7	1.5	0.3	3.5

Box Number: 35

	SOV	HOV2	HOV3+	Total
AMSH	0.5	1.5	0.5	2.5
AMPK	0.4	1.7	0.6	2.7
MD	1.2	2.9	1.1	5.1
PMSH	0.4	0.8	0.3	1.5
PMPK	0.9	1.7	0.8	3.4
Total	3.4	8.6	3.2	15.2



Box Number: 36

	SOV	HOV2	HOV3+	Total
AMSH	0.5	0.6	0.2	1.4
AMPK	1.3	0.9	0.2	2.5
MD	3.0	2.1	0.7	5.9
PMSH	0.5	1.4	0.3	2.2
PMPK	0.3	3.2	0.9	4.3
Total	5.7	8.2	2.3	16.2

Box Number: 37

	SOV	HOV2	HOV3+	Total
AMSH	0.1	0.2	0.1	0.4
AMPK	0.4	0.4	0.1	0.9
MD	0.2	0.5	0.2	0.8
PMSH	0.0	0.3	0.1	0.4
PMPK	0.1	0.4	0.2	0.7
Total	0.8	1.7	0.6	3.1

Box Number: 38

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.2	0.1	0.3
AMPK	0.1	0.2	0.0	0.3
MD	0.4	0.9	0.3	1.6
PMSH	0.1	0.5	0.2	0.8
PMPK	0.0	1.2	0.3	1.5
Total	0.7	3.0	0.8	4.5

Box Number: 39

	SOV	HOV2	HOV3+	Total
AMSH	0.6	0.7	0.2	1.4
AMPK	1.6	1.1	0.3	3.1
MD	2.8	1.7	0.6	5.0
PMSH	0.4	1.1	0.3	1.8
PMPK	0.3	2.4	0.8	3.5
Total	5.7	7.0	2.1	14.8

Box Number: 40

	SOV	HOV2	HOV3+	Total
AMSH	0.0	0.1	0.0	0.1
AMPK	0.1	0.1	0.0	0.2
MD	0.1	0.1	0.1	0.2
PMSH	0.0	0.1	0.0	0.1
PMPK	0.0	0.5	0.3	0.8
Total	0.2	0.8	0.4	1.4

Box Number: 41

	SOV	HOV2	HOV3+	Total
AMSH	0.2	0.3	0.1	0.5
AMPK	0.5	0.5	0.0	1.0
MD	0.9	0.9	0.3	2.1
PMSH	0.2	0.5	0.0	0.7
PMPK	0.1	1.3	0.0	1.4
Total	1.9	3.5	0.3	5.7

Box Number: 42

	SOV	HOV2	HOV3+	Total
AMSH	0.4	0.5	0.1	1.0
AMPK	1.2	0.8	0.3	2.2
MD	1.9	0.9	0.4	3.2
PMSH	0.3	0.6	0.3	1.2
PMPK	0.2	1.6	1.0	2.8
Total	4.0	4.3	2.2	10.5

LEGEND

	1 Express Toll Lane	AMSH (AM Shoulder) 5:00-6:30 a.m., 8:30-9:30 a.m.	SOV (Single Occupant Vehicle)
	2 Express Toll Lanes	AMPK (AM Peak) 6:30-8:30 a.m.	HOV (High Occupancy Vehicle)
	High Occupancy Vehicle (HOV) Lane	MD (Midday) 9:30 a.m.-2:30 p.m.	HOV 2 (HOV with two occupants)
	General Purpose (GP) Lane	PMSH (PM Shoulder) 2:30-3:30 p.m., 6:30-7:00 p.m.	HOV 3+ (HOV with three or more occupants)
0.0	Weekday Express Toll Lane Traffic Volumes	PMPK (PM Peak) 3:30-6:30 p.m.	
		Total Weekday Express Toll Lane Traffic Volume) 5:00 a.m.-7:00 p.m.	

NOTE: All volumes shown represent thousands of vehicles.