

# **I-5 Pavement Reconstruction Projects**

## **Final Existing Transportation Conditions Technical Report**

*Prepared for*

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## **ACRONYMS**

ACO	Average car occupancy
CBD	central business district
CCTV	Closed Circuit Television Cameras
CD	collector-distributor
CT	Community Transit
EWITS	Eastern Washington Intermodal Transportation Study
GP	general purpose
HACs	High Accident Corridors
HALs	High Accident Locations
HAR	Highway advisory radio
HOV	high occupancy vehicle
IRT	Incident Response Team
ITS	Intelligent Transportation System
Metro	King County Metro
MVM	million vehicle miles
PALs	Pedestrian Accident Locations
PT	Pierce Transit
SFTA	Strategic Freight Transportation Analysis
ST	Sound Transit
ST	Sound Transit
TSMC	Traffic Systems Management Center
VMS	Variable message signs
vph	vehicles per hour
WSDOT	Washington State Department of Transportation



# 1. INTRODUCTION

The Washington State Department of Transportation (WSDOT) has identified the need to rehabilitate and/or reconstruct the pavement of I-5 through the City of Seattle between approximately the Boeing Access Road and Northgate Way. This segment of I-5 represents the busiest traffic corridor in the state of Washington, with over 280,000 vehicles traveling on I-5 per day.

As part of the I-5 Pavement Reconstruction Projects study, an evaluation of existing conditions in the I-5 Corridor is needed. This technical report summarizes the initial traffic data collection efforts and existing transportation conditions for the I-5 PRP study. The information in this report will be used to support traffic forecast and modeling work; problem definition, alternatives development, planning, and conceptual design work for the study. Once the scope of the traffic operations element of the project is defined in Phase 2, additional detailed information may be necessary to compile to supplement the information in this report.

The transportation study area is bounded by 220th Street SW (Snohomish County) to the north and Interurban Avenue (King County south of the Seattle city limit) to the south and includes SR 520 between I-5 and the Montlake Boulevard Interchange and I-90 between I-5 and the Mount Baker Tunnel. The study area includes approximately 28 interchanges on I-5 and approximately three signal-controlled ramp termini and arterial street intersections in the vicinity of each interchange.

The report summarizes the following characteristics and services of I-5:

- **Traffic Volumes and Operations.** I-5 currently operates under congested conditions for up to nine hours during an average weekday, with traffic volumes often exceeding 18,000 vehicles per hour (vph) on the Ship Canal Bridge and 16,000 vph south of the Spokane Street interchange. Weekend traffic peaks between 10:00 AM and 6:00 PM with volumes approaching 85 percent of the weekday peak hour volumes. This section summarizes traffic patterns as they fluctuate throughout the year, and during an average week and weekday. This section also summarizes general freeway operations and vehicle occupancy.
- **I-5 Intelligent Transportation System (ITS) Components.** Various intelligent transportation systems, or ITS, exist on the I-5 corridor. Intelligent transportation systems monitor and manage traffic flow, reduce congestion, suggest alternate routes to travelers, and provide tools for transportation professionals to collect and analyze data about system performance ([www.wsdot.wa.gov](http://www.wsdot.wa.gov)).
- **Transit Services.** Transit utilizes I-5 with the highest ridership between the Ship Canal Bridge and I-90. This section of I-5 serves up to 66 transit routes and nearly 50,000 riders per day. Congestion in the corridor affects transit operations and schedule reliability, which impacts travel for thousands of transit riders. This section summarizes existing transit routes that access or utilize portions of I-5 within the study area, collected from King County Metro, Sound Transit, Community Transit and Pierce Transit, as well as major shuttle services such as the University of Washington shuttle to Harborview Medical Center. This information included data for ridership, headways, hours of service, and on-time performance. Routes on parallel highways or that cross I-5 were excluded. Transit facilities in the corridor were also identified, including park and ride lots, transit centers, and flyer stops.

- **Truck and Goods Movement.** Over 12,000 trucks per weekday travel on I-5 in the study area with 75 percent of truck movement occurring between 6:00 AM and 6:00 PM. Since an estimated \$187.2 million in cargo is carried by trucks per day (through the I-5 weigh station at Federal Way), travel time reliability is a significant concern. This section summarizes truck volumes and classification, flammable/hazardous cargo movements in the corridor, travel-time reliability, and commodity flow information. This information is also needed to support assumptions in both the freeway operations and noise modeling efforts.
- **Traffic Safety and Analysis.** I-5 through the study area has an incident rate of 1.4 accidents per million vehicle miles (MVM) northbound and 1.7 accidents per MVM southbound, which is higher than the state average of 1.37 accidents per MVM (year 2002). Accident data for the most recent three-year period on all freeway mainline segments and ramps and arterial roadways within the study area is summarized. This section also identifies accident severity (property damage, injury, fatality) and system delays and lists High Accident Locations (HALs), High Accident Corridors (HACs), and Pedestrian Accident Locations (PALs).
- **Non Motorized Pedestrian and Bicycle Data.** Pedestrian and bicycle paths adjacent to and crossing I-5 within the study area were identified.

## 2. TRAFFIC VOLUMES AND OPERATIONS

I-5 currently operates under congested conditions for up to nine hours during the average weekday. Weekday traffic volumes often exceed 18,000 vph on the Ship Canal Bridge and 16,000 vph south of the Spokane Street interchange. Weekend traffic peaks between 10:00 AM and 6:00 PM with volumes approaching 85 percent of the weekday peak hour volumes.

This section summarizes traffic patterns as they fluctuate throughout the year and during an average week and weekday. The following sections also summarize congestion issues, travel time reliability, and vehicle occupancy.

### 2.1 FREEWAY TRAFFIC VOLUMES

Freeway and ramp data were collected to establish the current volume conditions along I-5 for eventual use in the regional travel demand forecasting and freeway operations models. The data were gathered from the Traffic Systems Management Center (TSMC) of WSDOT's Northwest Region Traffic Office. WSDOT compiles data from all of their loop detectors quarterly and produces compact disks that contain counts in 5-minute increments. Freeway and ramp volume information summarized in this report was based on 5-minute volumes for all Tuesdays, Wednesdays, and Thursdays in October 2004.

October is considered to be a typical month because it has no major holidays and schools are in session (including the University of Washington), which results in typical daily peaking characteristics. However, the October average daily traffic, AM, and PM peaks are compared to the average as reported in WSDOT Ramps and Roadways to adjust for any deviation in the total traffic that occurs. In cases where loop detectors were not functioning properly during this time period, data from October or April of previous years were substituted since traffic conditions in April are similar to October.

In cases where information from the WSDOT 5-minute data compact disks was not available, tube count data were gathered from WSDOT's Northwest Region Traffic Office to estimate average hourly volumes. Tube count locations included:

- I-5 southbound off ramp to westbound Spokane Street
- I-5 southbound off ramp to Columbian Way
- I-5 southbound on-Ramp from South Spokane Street
- I-5 northbound off ramp to westbound Spokane Street
- I-5 northbound off ramp to Columbian Way
- I-5 southbound off ramp to S. Forest Street
- I-5 southbound off ramp to Swift/Albro Place
- I-5 northbound collector-distributor (CD) lanes to South Dearborn Street
- I-5 southbound on-ramp from 6th Avenue South

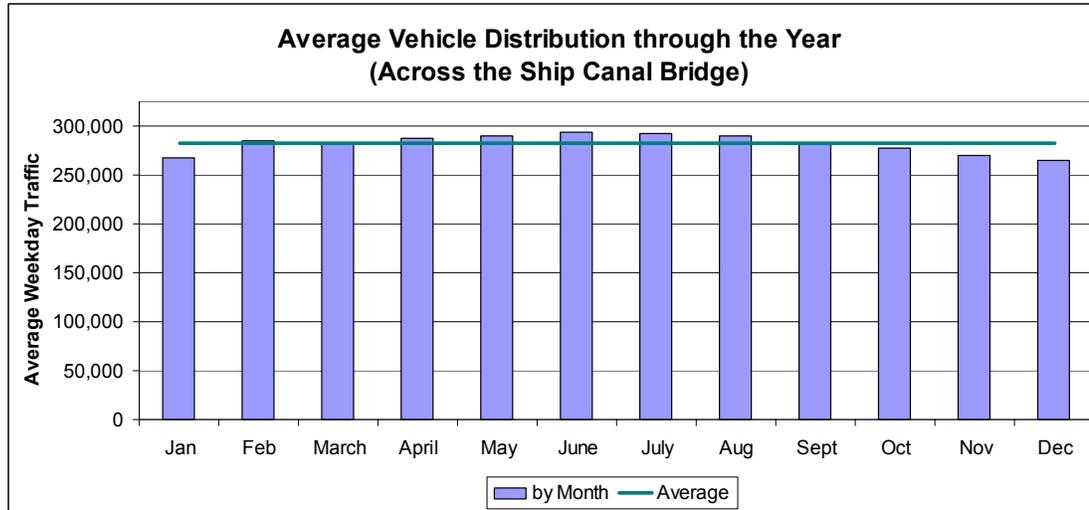
Appendix A includes WSDOT year 2004 Ramps and Roadways traffic volumes. The TSMC count data summarized as average hourly volumes for the mainline and ramp locations along I-5 for a five-hour AM peak period (5:00 AM to 10:00 AM) and five-hour PM peak period (2:30 PM to 7:30 PM) will be available at a later date.

The following two sections summarize general traffic distribution through the year, week, and day and summary information for key locations.

### 2.1.1 GENERAL DISTRIBUTION OF TRAFFIC THROUGH THE YEAR, WEEK, AND DAY

This section summarizes traffic peaking characteristics through the year, week, and day across the Ship Canal Bridge. Several locations were reviewed and showed to have similar peaking characteristics as the Ship Canal Bridge.

Figure 2-1 indicates the average weekday traffic across the Ship Canal Bridge (on I-5 mainline and reversible lanes) varies by up to 10 percent through the year. Traffic increases slightly in the summer months likely due to an increase in recreational trips and decreases in the winter months likely due to holidays.



Source: WSDOT 2003 Annual Traffic Report, page XLI.

**Figure 2-1. Distribution of Traffic through the Year (2003)**

Figures 2-2 and 2-3 depict the distribution of traffic through the week and day on I-5 (mainline and reversible lanes). Less travel occurs on Saturdays and Sundays; however the travel that does occur tends to peak consistently between 10:00 AM and 5:00 PM. Monday travel tends to be light while Friday is heavier. Tuesday through Thursday travel is typical for an average weekday which includes work and school commutes and normalized non-work trips with limited peaks or valleys associated with recreation or holidays. Tuesday through Thursday travel typically peaks 6:00 and 9:00 AM and 2:00 and 6:00 PM.

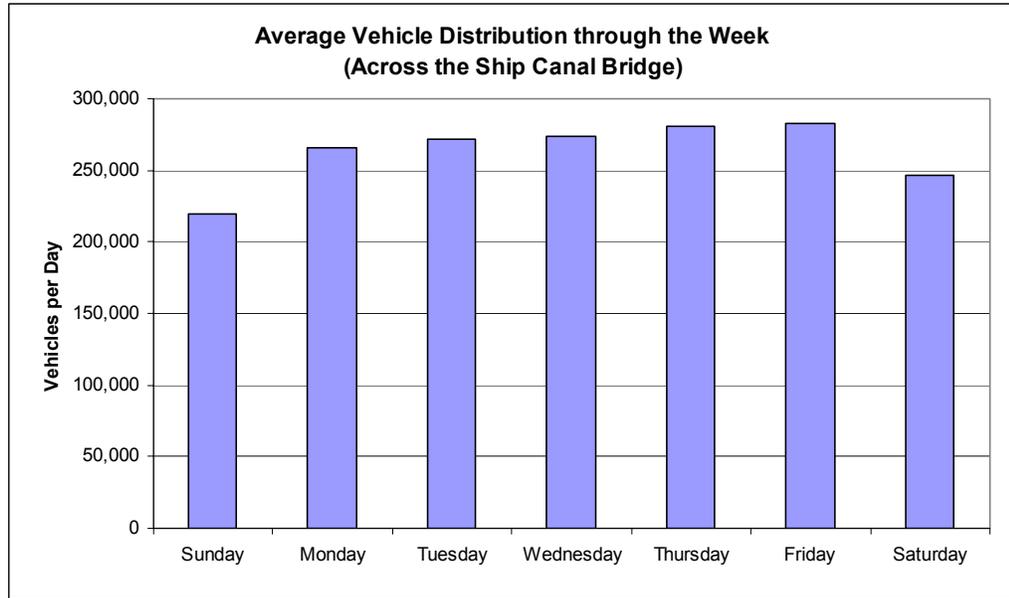


Figure 2-2. Distribution of Traffic through the Week (October 2004)

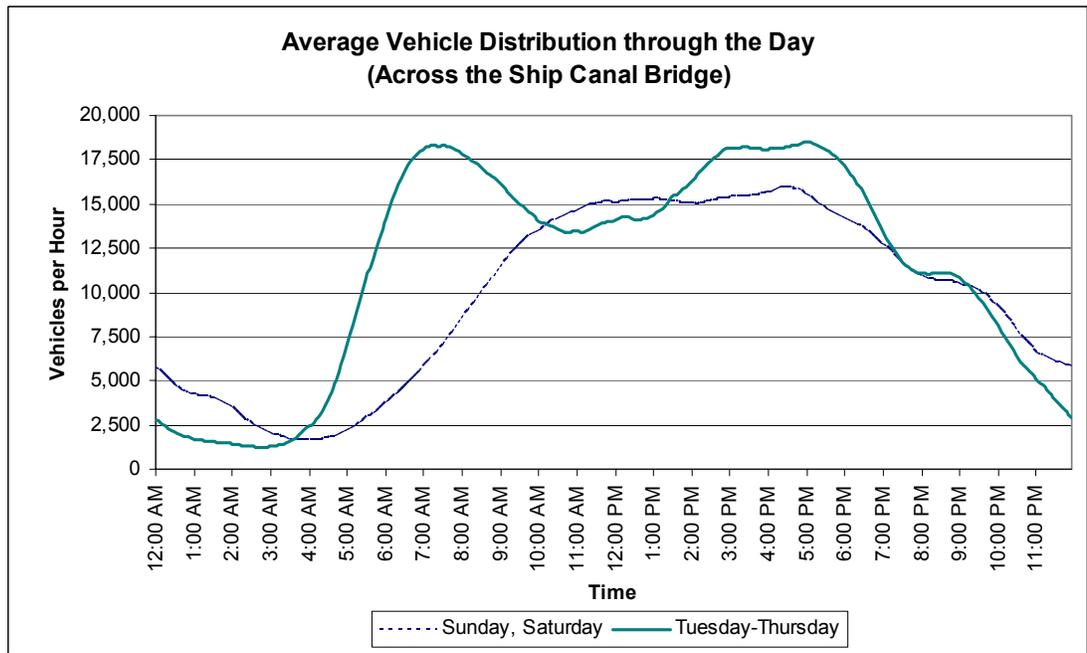


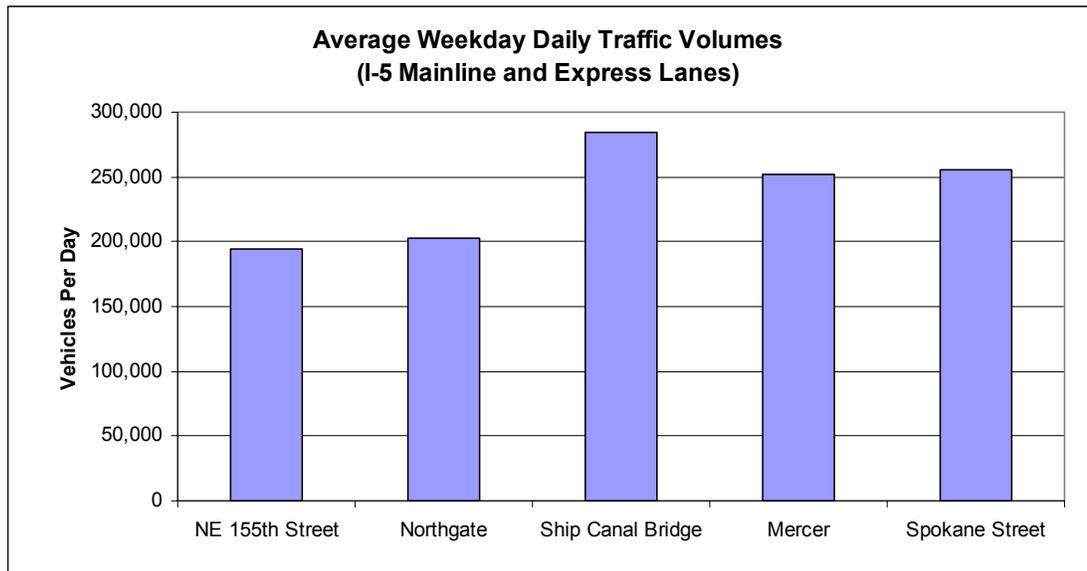
Figure 2-3. Distribution of Traffic through the Day (October 2004)

## 2.1.2 SUMMARY INFORMATION FOR KEY LOCATIONS

The previous section describes general travel peaks that occur through the year, week, and day. The following summarizes the average weekday traffic volumes and hourly volumes by direction for the AM and PM peaks at key locations on I-5 which include:

- NE 155th Street
- Northgate (north of reversible lane termination)
- Ship Canal Bridge
- Mercer Street
- Spokane Street

Over 280,000 vehicles travel I-5 (mainline and reversible lanes) every weekday in the downtown Seattle central business district (CBD). Nearly 200,000 vehicles travel I-5 daily between Northgate and 220th Street SW. Figure 2-4 depicts the traffic volumes on I-5 mainline and the reversible lanes (both northbound and southbound).



**Figure 2-4. Average Weekday Daily Traffic Volumes for Key Locations**

Figures 2-5 and 2-6 illustrate the AM and PM peak hour volumes at key locations on I-5. In the AM peak period, traffic flows heavier into the City of Seattle CBD area (either to access the City of Seattle, I-90, or SR 520). In the PM peak period, traffic flows heavier out of the City of Seattle CBD area (southbound south of I-90 and northbound north of the Ship Canal Bridge).

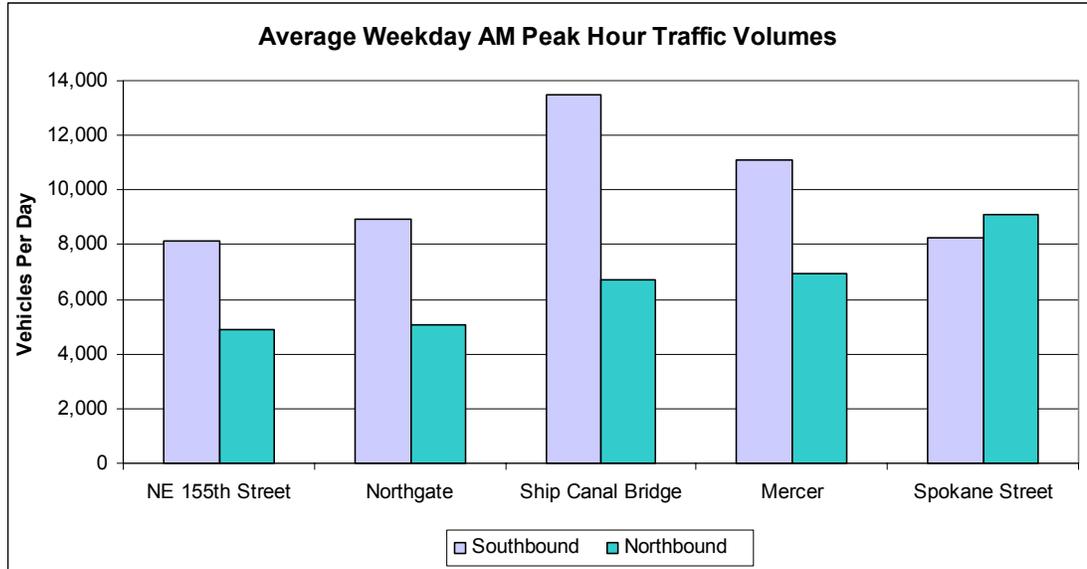


Figure 2-5. Average Weekday AM Peak Hour Volumes for Key Locations

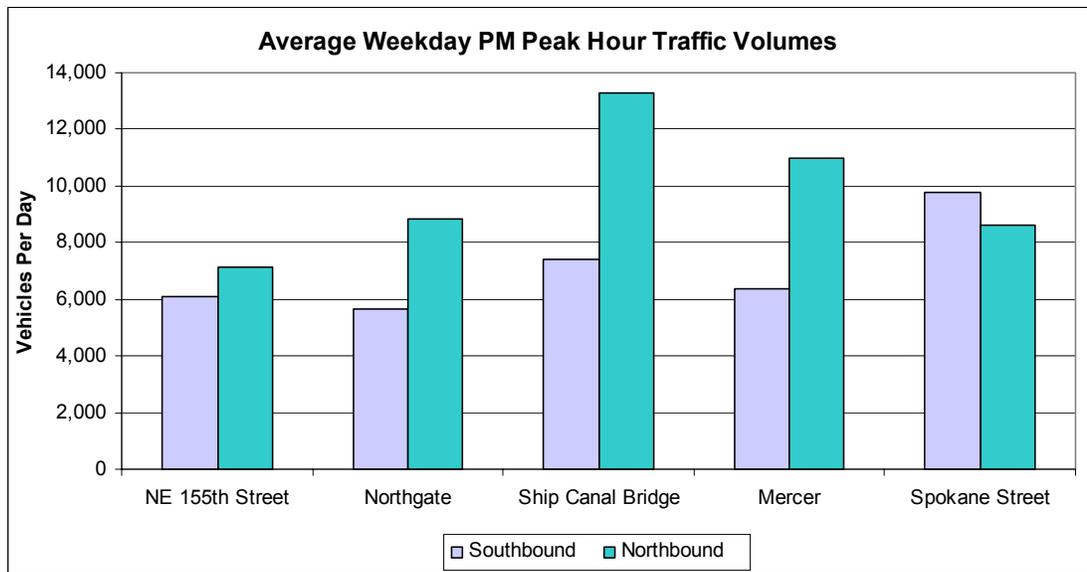


Figure 2-6. Average Weekday PM Peak Hour Volumes for Key Locations

## 2.2 LOCAL TRAFFIC VOLUMES

An inventory of intersection turning movement counts was conducted through WSDOT and City of Seattle staff. The inventory includes approximately 150 arterial intersections, primarily with I-5 interchange ramps. Count data conducted within the past two years is available for 25 percent of the intersections inventoried and data is available within the past five years for 45 percent of the intersections inventoried. Appendix B lists the intersections for which data was requested, where data is available for the past 3 years and historic data (greater than 3 years old), and the month and year the count occurred.

## 2.3 VEHICLE OCCUPANCY DATA

Peak period vehicle occupancy data for the I-5 study area are summarized in this section. The study area boundaries for the existing conditions data collection is from the Snohomish County line at the north end to the Interurban Avenue interchange at the south end. The data were retrieved from the TRAC website (<http://trac29.trac.washington.edu/hov/>). Data were collected for dates between 2000 and 2004. Data were available on I-5 for the following locations:

- N. 185th Street, N. 145th Street.
- S. Michigan Street.
- S. Albro Place.

For all locations, the peak periods are defined as 6:00 AM to 9:00 AM for the morning commute period, and 3:00 PM to 6:00 PM for the afternoon commute period. Weekday data validated by TRAC was used. Average car occupancy (ACO) is calculated using the following equation:

$$\frac{(Single\ Occupant\ Vehicle * 1.0) + (Two\ Person\ Carpool * 2.0) + (Three\ Person\ Carpool * 3.0) + (Four+ Person\ Carpool * 4.1)}{(Single\ Occupant\ Vehicle + Two\ Person\ Carpool + Three\ Person\ Carpool + Four\ Person\ Carpool)}$$

The ACO values presented in the tables below were calculated by averaging the ACO for each data point available from TRAC. The ACO for general purpose (GP) lanes in the corridor ranged from a low of 1.02 to a high of 1.56, with the exception of the northbound GP lanes at Corson Avenue, where an ACO of 2.38 was calculated for one day in 2004. The ACO for HOV lanes in the corridor ranged from a low of 1.70 to a high of 2.25.

### 2.3.1 N. 185TH STREET

The ACO decreased between 2000 and 2001 in the northbound GP lanes during the PM peak period and increased in the southbound GP and HOV lanes during the AM peak period as shown in Table 2-1 below. Between 2001 and 2002, ACO decreased or remained the same at all locations.

**Table 2-1. Average Car Occupancy – N. 185th Street**

Direction and Lane	2000	2001	2002
I-5 Northbound AM GP lane	n/a	n/a	1.45
I-5 Northbound AM HOV lane	n/a	n/a	n/a
I-5 Northbound PM GP lane	1.56	1.45	1.26
I-5 Northbound PM HOV lane	n/a	n/a	n/a
I-5 Southbound AM GP lane	1.02	1.02	1.02
I-5 Southbound AM HOV lane	2.03	2.05	1.99*
I-5 Southbound PM GP lane	n/a	n/a	n/a
I-5 Southbound PM HOV lane	n/a	n/a	n/a

n/a – Data is not available for this location.

\* ACO is less than 2.0 due to violators.

### 2.3.2 N. 145TH STREET

Table 2-2 shows the ACO at N. 145th Street generally increased between 2002 and 2003, except for the northbound HOV lane during the AM peak period and the southbound GP and HOV lanes during the PM peak period. Between 2003 and 2004, ACO generally decreased, except for the southbound GP and HOV lanes during the AM peak period and the southbound HOV lane during the PM peak period.

**Table 2-2. Average Car Occupancy – N. 145th Street**

Direction and Lane	2002	2003	2004
I-5 Northbound AM GP lane	1.08	1.11	1.04
I-5 Northbound AM HOV lane	2.10	2.08	2.08
I-5 Northbound PM GP lane	1.10	1.13	1.09
I-5 Northbound PM HOV lane	2.09	2.10	2.07
I-5 Southbound AM GP lane	1.02	1.04	1.04
I-5 Southbound AM HOV lane	2.00	2.03	2.05
I-5 Southbound PM GP lane	1.23	1.21	1.18
I-5 Southbound PM HOV lane	2.25	2.21	2.22

### 2.3.3 I-5 SOUTH OF SEATTLE CBD (Corson Avenue S., S. Michigan Street, and S. Albro Place)

At the south end of the corridor, data were available S. Michigan Street, and S. Albro Place. Note that limited data were available for Michigan Street — only one date for each location, and for the northbound GP lanes in the AM peak period for S. Michigan Street.

Table 2-3 shows the ACO on I-5 at S. Albro Place decreased between 2002, 2003, and 2004 in the northbound direction during the AM peak period in both the GP and HOV lanes, while it increased during the PM peak period. In the southbound direction, the ACO increased during the AM peak period, but decreased during the PM peak period.

**Table 2-3. Average Car Occupancy – I-5 South of Seattle CBD  
 S. Michigan Street, and S. Albro Place**

Direction and Lane	2002	2003	2004
<b>S. Michigan Street</b>			
I-5 Northbound AM GP Lane	1.05 (year 2000)	n/a	n/a
<b>S. Albro Place</b>			
I-5 Northbound AM GP lane	1.08	1.07	1.03
I-5 Northbound AM HOV lane	1.79	1.70	n/a
I-5 Northbound PM GP lane	1.18	1.19	n/a
I-5 Northbound PM HOV lane	1.91	2.03	n/a
I-5 Southbound AM GP lane	1.06	1.09	n/a
I-5 Southbound AM HOV lane	2.07	2.09	n/a
I-5 Southbound PM GP lane	1.13	1.13	n/a
I-5 Southbound PM HOV lane	2.14	2.12	n/a

n/a – Data is not available for this location.

## 2.4 TRAFFIC OPERATIONS

A series of bottlenecks and congestion points have been identified on I-5 between 220th Street SW and Boeing Access Road that cause congestion on the freeway. Figure 2-7 graphically summarizes the traffic operational issues and needs along I-5 between 220th Street SW and Boeing Access Road by direction. Figure 2-8 depicts congestion on northbound and southbound I-5 between 220th Street SW and Boeing Access Field for the hours between 5:00 AM and 8:00 PM (provided by WSDOT which estimates freeway congestion based on detector occupancy). In Figure 2-8, the red and black areas represent stop-and-go conditions on I-5. The location and duration of the congestion can be determined by the ramp locations listed on the side of the graph and the times of day listed on the bottom of the graph.

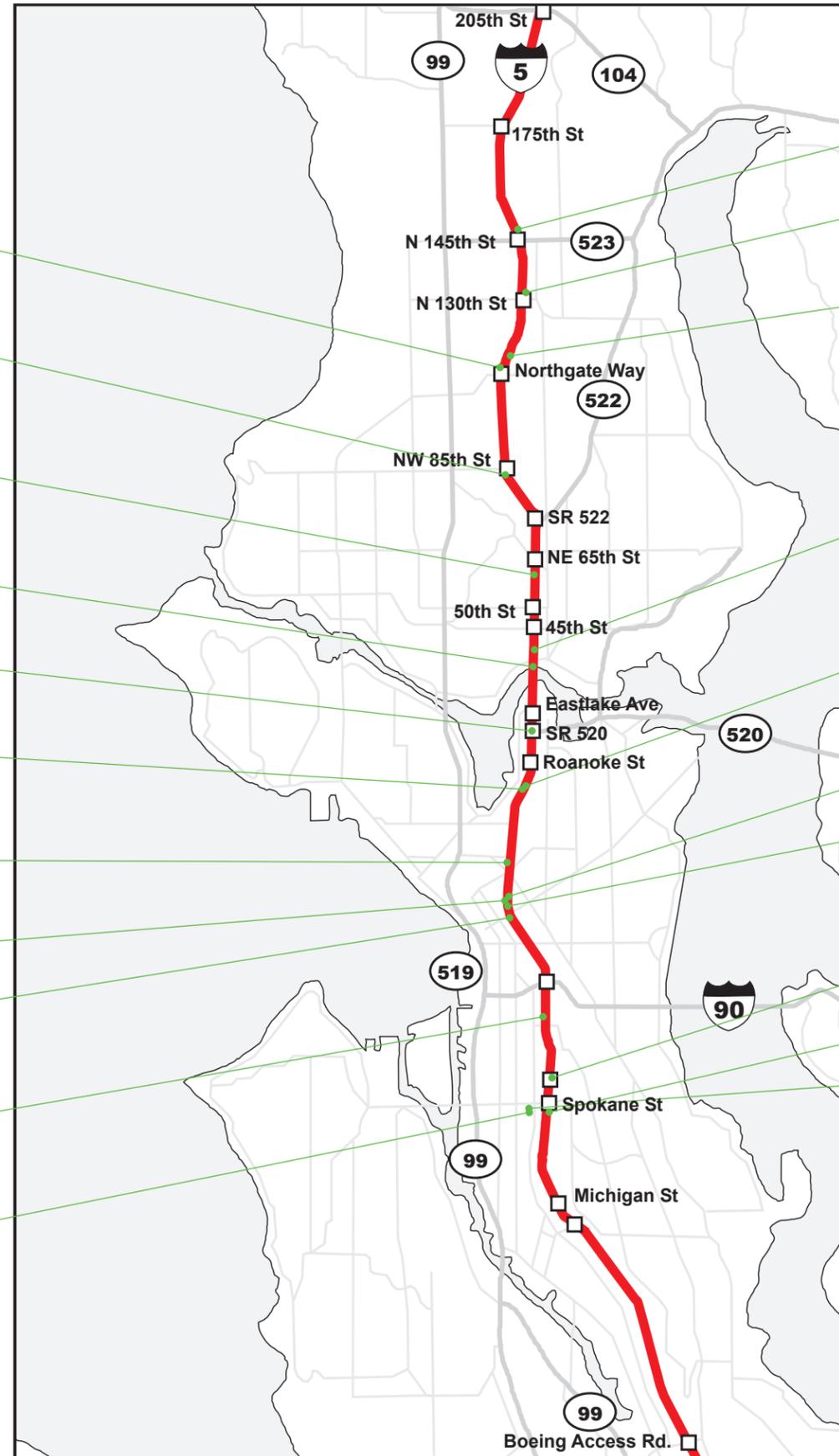
Both directions of I-5 are affected by the following issues:

- Because of space limitations, meters do not exist on ramps between Mercer Street and Spokane Street. This reduces the effectiveness of the ramp metering system.
- Several sections of I-5 have traffic demand that nears the sections capacity which results in congestion. Queues continue to build as traffic demand exceeds capacity.
- Capacity is reduced on several sections of I-5 due to a lack of lane continuity or traffic demand simply exceeding capacity.
  - Lane continuity can be disrupted by series of lanes that “drop” to an off ramp or “add” from an on ramp. For instance when a lane drops to an off ramp, the mainline is reduced by a lane. If the through traffic exceeds the narrowed-mainline capacity after a drop lane or if a high through traffic volume has to merge left out of the drop lane, congestion may occur.
  - Traffic flow can also be disrupted when on ramps enter on the left-side followed by right-side off ramps or vice versa, causing weaving sections across one or more lanes.
  - Lack of HOV lane continuity and conflicts with general purpose traffic reduces service for bus and carpool vehicles.
- Segments of the HOV lane do not meet current performance standards (speeds are below 45 mph) due to the HOV demand and roadway geometrics.

## Southbound Issues

1. Northgate Way: An HOV bypass does not exist at the metered on ramp.
2. NE 85th to Lake City Way:  Congestion occurs due to the series of add and drop lanes, which occurs at NE 85th off & on, 70th off, and Lake City Way on.
3. Ravenna/NE 50th St/45th St: Congestion occurs between Ravenna Blvd and NE 45th St due to weaving movements and the Ravenna left-side on ramp.
4. NE 45th to SR 520: Traffic weaves from right-side NE 45th on ramp to the left-side SR 520 off ramp.
5. SR 520 Interchange: There is no connection to the express lanes for transit or HOV.
6. SR 520 to Mercer St: Congestion occurs as traffic weaves from the left side SR 520 on ramp to the right side Mercer St off ramp.
7. Yale to Union: Congestion occurs as traffic weaves through this section with the on ramp add lane and off  ramp drop lane.
8. Seattle CBD: Congestion occurs as the CD splits the roadway with only two through GP lanes.
9. Express Lanes: Congestion occurs on the express lanes where they terminate in downtown Seattle with only a single lane continuing south.
10. I-90 Collector Distributor:  Congestion occurs where I-90/SR-519 collector distributor merges 3 lanes to 2 lanes.
11. Spokane St: Congestion occurs  where lane drops to Spokane Street.

**Figure 2-7**  
I-5 Operations Study-Project Needs Summary



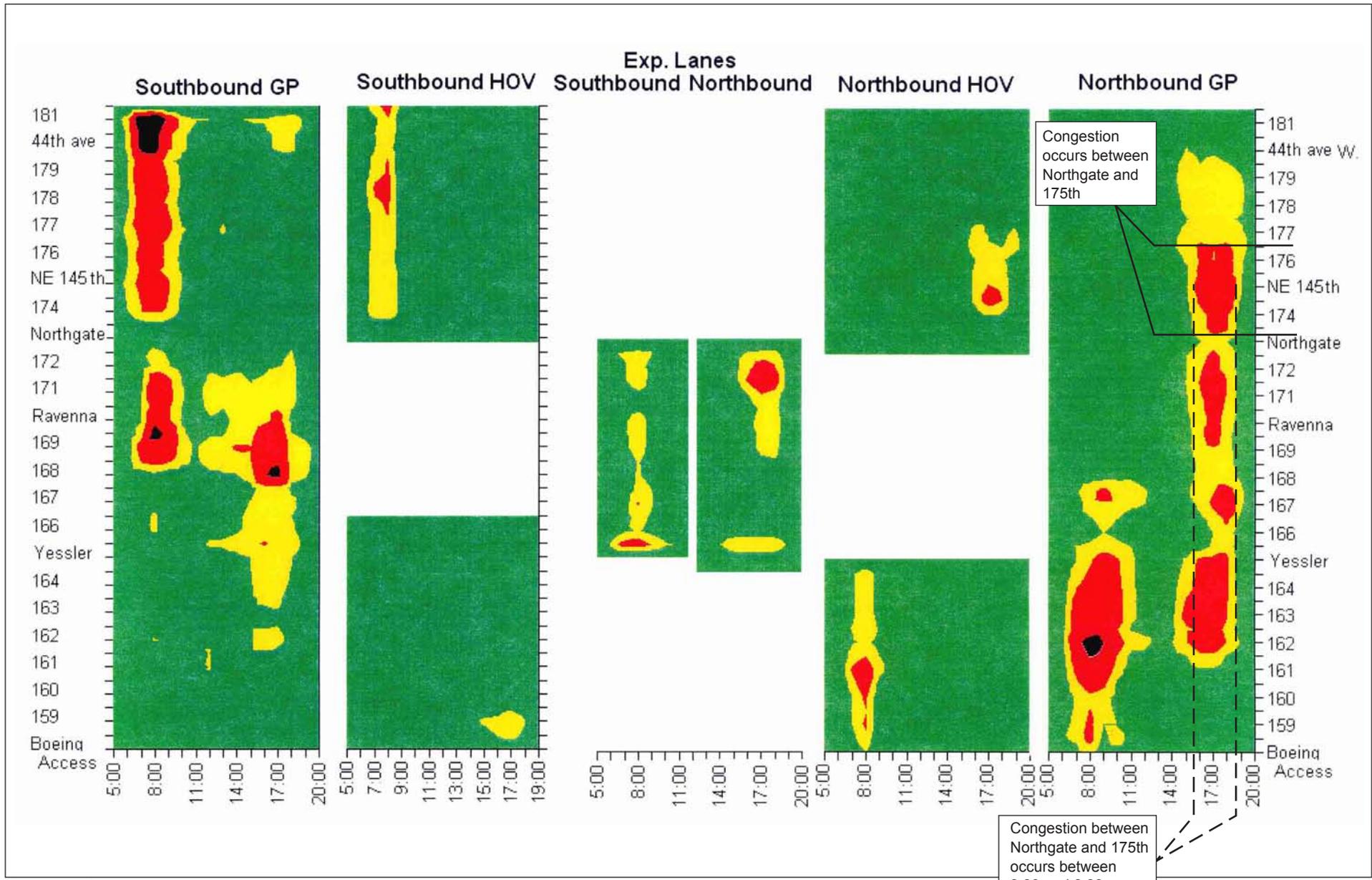
## Northbound Issues

1. NE 145th St: Ramp from I-5 to NE 145th St is over capacity and queues onto the freeway.
2. NE 130th St: Congestion occurs as the off ramp traffic yields to 5th Ave NE and queues onto the freeway.
3. Express Lanes: Both the HOV and GP lane from the express lanes join mainline I-5 as add lanes. However, traffic from the mainline merge across into the express lanes GP lane which causes delay in the express lanes.
4. SR 520 to Lake City Way:  Congestion occurs due to the series of drop and add lanes which occur at 50th on, Ravenna off, Lake City Way off, to 70th on,  85th off & on, and Northgate off.
5. Mercer to SR 520: Traffic weaves between the left side Mercer on to the right side SR 520 off, which causes congestion through this section. In addition, a lane drops to SR 520.
6. Express Lane: A lane drops to the express lanes and to Seneca exit which results in only two northbound GP lanes.
7. I-90 CD: Narrows from three lanes to one, and the section experiences several weaving movements.
8. Spokane St: Congestion occurs between Spokane St and I-90 due to high traffic volumes and weaving movements.
9. Spokane St: A lane drops to the Spokane St off ramp and causes congestion on the main line to the south.
10. Spokane St (on Arterial): Weave and grade on Spokane St ramp causes congestion back to SR 99.

## General (both directions)

1. Because of space limitations, meters do not exist on all ramps. This reduces the effectiveness of of entire ramp metering system.
2. HOV lane performance north of Express Lane terminus falls short of current performance standard.
3. Because of travel pattern changes mainline congestion often occurs throughout the day and on weekends in direction opposite express lane operation.





**Figure 2-8**  
**Congestion Flow Maps**



## 2.4.1 NORTHBOUND I-5 MAINLINE TRAFFIC OPERATIONS

The following summarizes congested areas of northbound I-5 during the AM or PM peak periods.

- **At the Spokane Street/Columbia Way interchange.** A lane drops to the Spokane Street/Columbia Way off ramp and a lane adds onto I-5 from the on ramp. The mainline section after the off ramp is over capacity and congestion builds through the morning peak between 6:30 and 10:00 AM.
- **Between the Spokane Street/Columbia Way and I-90 interchanges.** Congestion occurs for at least 2 to 3 hours in both the morning and evening between the Spokane Street and I-90 interchanges. The traffic demand for the ramps and mainline is near or over capacity which causes this section to operate with congestion. The on ramp from Spokane Street/Columbia Way is a single-add lane, which has a volume of 2,200 vehicles per hour. At the downstream I-90 interchange, the outside lane drops to the two-lane off ramp which has a volume near 3,300 vph during the AM peak hour.
- **Between the reversible lane off ramp and downtown Seattle.** Several movements occur through this section starting with the left-side drop lane to the reversible lanes, then the left-side drop lane to Seneca Street, the right-side I-90 CD on-ramp, and left-side add lane from University Street. The series of closely located ramps on both the right and left-side reduces the through-lane capacity as traffic weaves to and from the various ramps. I-5 is reduced from four lanes south of the reversible lanes to two lanes north of Seneca Street.
- **Between Mercer Street and SR 520.** Congestion occurs south of Mercer Street through the SR 520 interchange for two hours during both the AM and PM peak hours. Congestion begins at the drop lane from I-5 to Mercer Street. This off ramp is often over capacity with a queue that forms on the inside left lane. The Mercer Street on ramp enters on the left side, followed by a right-side drop lane to SR 520 (I-5 narrows from four lanes south of SR 520 to three lanes after the ramp to SR 520). Traffic weaves through the short section between the left-side Mercer on ramp to the right-side SR 520 off ramp conflicting with through-traffic flow. Additionally, congestion on SR 520 sometimes queues back onto the I-5 mainline..
- **Between NE 45th Street/NE 50th Street and Northgate Way.** Congestion occurs in the evening peak period from 3:30 PM to 6:30 PM through this section due to the series of drop and add lanes at the following ramp locations: NE 50th Street on, Ravenna Boulevard off, Lake City Way off, 70th Street on, 85th Street off and on, and Northgate Way off. In addition, the reversible lanes terminate near Northgate as an additional general purpose lane and HOV lane. HOV traffic from mainline I-5 merges across the additional general purpose lane to access the HOV lane which increases conflicts and congestion.
- **North of Northgate Way to NE 175th Street.** Congestion occurs in the PM peak period from 3:30 to 6:30 PM. A lane drops to NE 130th Street, followed by the off-ramp to NE 145th Street. The NE 145th Street off ramp must yield to traffic on 5th Avenue which causes a queue onto the freeway GP lanes. Congestion occurs on both the GP and HOV lanes through this section. Further downstream, a lane drops to NE 175th Street narrowing the mainline to three GP lanes and an HOV lane. Congestion occurs through the PM peak period at this location due to the high volume through-movement and the reduction in mainline lanes.

## 2.4.2 SOUTHBOUND I-5 MAINLINE TRAFFIC OPERATIONS

The following summarizes congested areas of southbound I-5 during the AM or PM peak periods.

- **Between 220th Street SW and Northgate Vicinity.** Congestion occurs in this area between 6:30 and 9:00 AM. Congestion in this area is a result of the Northgate vicinity congestion combined with the high entering traffic volumes onto I-5, especially at the interchange with SR 104 and the full lane of traffic that enters as an add lane at the SR 523/NE 145th Street interchange. Congestion also occurs at the entrance to the reversible lanes at Northgate, especially through the inside two lanes. The HOV lane exits the mainline to access the reversible lanes and the left-most GP lane has the option to exit. HOV traffic not destined to the HOV lanes must merge right. The mainline congestion through this section causes some congestion in the HOV lanes but for a shorter duration (7:00 to 8:00 AM)
- **Northgate Vicinity to NE 45th/50th.** Congestion occurs between the Northgate vicinity and the NE 45th/50th Street interchange between 6:30 and 9:30 AM and between 3:00 and 5:00 PM. Congestion occurs through this section because through-traffic flow is interrupted by a series of add or drop lanes between Northgate and the Ship Canal Bridge that forces traffic to change lanes. Add or drop lanes occur at the NE 85th on and off ramps, the 70th off ramp, and Lake City Way on ramps. Near the NE 45th Street/NE 50th Street interchange, the Ravenna Boulevard on ramp accesses I-5 from the left-side, which increases weaving movements through this section.
- **Between NE 45th/50th Street and the Ship Canal Bridge.** Traffic volumes on I-5 southbound approaching the Ship Canal Bridge are over capacity today, and traffic is congested for several hours in the morning (6:30 to 9:30 AM) and evening (3:00 to 5:30 PM). Congestion is also affected by the weaving activity between the NE 45th Street on-ramp and the left lane exit for SR 520 eastbound. This congestion limits the ability of traffic to access SR 520 and affects upstream traffic.
- **Between SR 520 and Downtown Seattle.** Congestion occurs through downtown Seattle during the PM peak hour due to the left-side SR 520 on ramp, the series of drop and add lanes, as well as the lack of lane continuity. Only a single through-lane continues from the Ship Canal past the I-90 interchange. Traffic not destined to Seattle must merge to the left and weave through the SR 520 left side ramp traffic. Downstream of the left-side SR 520 on ramp, there is a series of right-side add and drop lanes beginning with a drop lane to Mercer Street, add lane from Yale Avenue, drop lane to Union Street, and drop/option to 6th Avenue/James/Cherry. I-5 Reversible Lanes
- **Southbound Through Downtown Seattle.** In the AM peak period, congestion occurs on the southbound I-5 reversible lanes because of a series of drop lanes to the downtown area. Additionally, vehicles traveling in the left-side HOV lane must cross two lanes to access the right-side HOV only Pine Street exit, or cross three lanes to access Mercer or Stewart Street exits, which interrupts through traffic flow. Where the reversible lanes terminate and merge with the I-5 mainline, there is a single general purpose lane, therefore HOV traffic must merge into the GP reversible lane and then merge again onto the I-5 mainline. Traffic operations in the reversible lanes are affected by both this lane merge activity and congestion on mainline I-5.
- **Northbound Near Northgate.** Congestion occurs near Northgate where the reversible lanes terminate. Traffic from mainline I-5 merge across into the add lanes from the reversible lanes.

### 2.4.3 FREEWAY TRAVEL-TIME

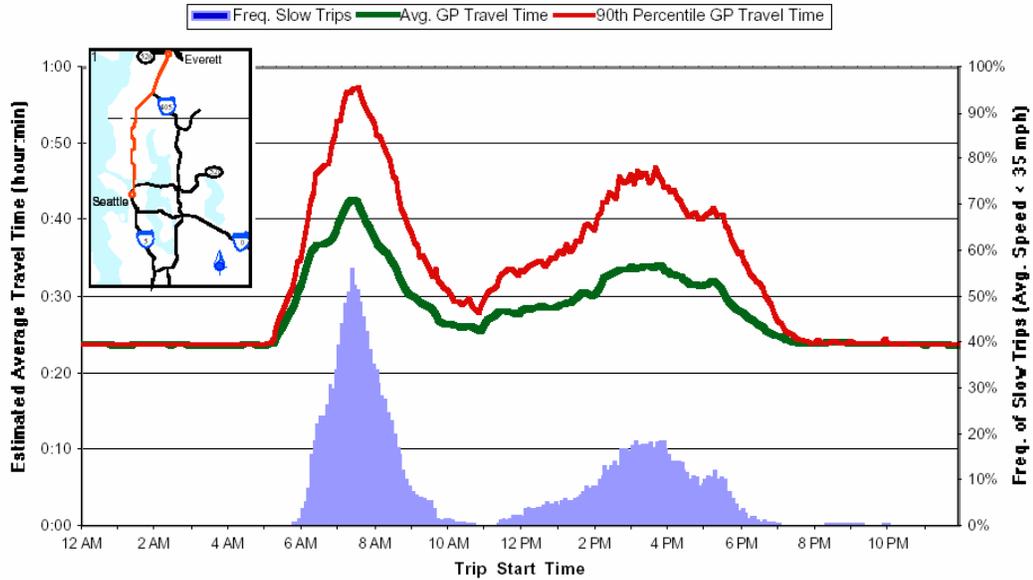
Travel time increases during the peak commute periods as congestion increases (described above). The Central Puget Sound Freeway Network Usage and Performance (1999 Update, Volume 1) authored by TRAC and WSDOT, describes in detail the travel time fluctuations for I-5 between the Seattle CBD and the SR 526 interchange in Everett to the north or SeaTac to the south. This document provides an overview of the use and performance on the primary freeways in the central Puget Sound region and also presents detailed travel time charts for many of these freeways, including I-5.

Average trip travel times were estimated for two sections of I-5—SR 526 interchange in Everett to the Seattle CBD, and Seattle CBD to SeaTac—for both the northbound and southbound directions. As described in Central Puget Sound Freeway Network Usage and Performance, 1999 data were used to estimate three measures for each trip: 1) average travel time, 2) 90th-percentile travel time (e.g., the travel time that nine out of ten trips would be less than), and 3) the likelihood of a “slow” trip, defined to be an average overall trip speed on the freeway of less than approximately 35 mph. All trips assume freeway-only routes on general-purpose mainline lanes and freeway-to-freeway ramps during an average weekday. On-ramps and off-ramps, HOV lanes, and reversible lanes are not included.

Figure 2-9 and 2-10 show the average weekday travel time on I-5 between the SR-526 interchange in Everett and downtown Seattle for the southbound and northbound directions, respectively. The green line represents the average travel time, measured with the left vertical axis, for trips beginning at a certain time. Figure 2-9 shows that it takes an average of about 43 minutes for a vehicle leaving Everett at 7:00 AM to travel 23.7 miles south to the Seattle CBD on the I-5 mainline. The figure indicates that it takes about 28 minutes to make this trip at noon, and about 34 minutes to make this trip at 4:00 PM. The red line on the chart represents the 90th-percentile travel time for this route. These travel times generally reflect a day with higher than normal traffic congestion, and travel times along this route would be less than this amount nine times out of ten. The 90th-percentile travel times for this route are about 57 minutes for a trip beginning at 7:00 AM, about 33 minutes for a trip beginning at noon, and about 46 minutes for a trip beginning at 4:00 PM.

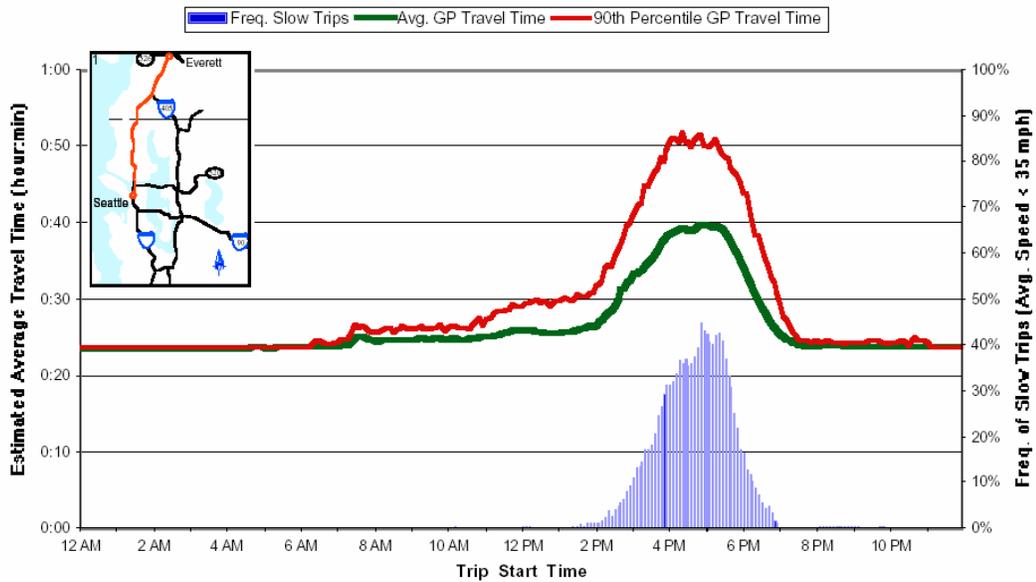
The degree to which a trip’s 90th percentile travel time differs from its average travel time indicates the variability of conditions routinely experienced for that trip. At 7:00 AM, the variability of the Everett-to-Seattle trip is about 14 minutes for a trip beginning at 7:00 AM; this represents an increase in trip time of about 33 percent. The variability for a trip beginning at noon is five minutes (an increase of about 18 percent), and about 12 minutes (and increase of about 35 percent) for someone leaving Everett at 4:00 PM.

Figure 2-10 shows that it takes an average of about 25 minutes for a person leaving Seattle at 7:00 AM to travel 23.7 miles north to Everett on the I-5 mainline. The figure indicates that it takes about 26 minutes to make this trip at noon, and about 39 minutes to make this trip at 4:00 PM. The 90th-percentile travel times for this route are about 27 minutes for a trip beginning at 7:00 AM, about 29 minutes for a trip beginning at noon, and about 51 minutes for a trip beginning at 4:00 PM. At 7:00 AM, the variability of the Seattle-to-Everett trip is about two minutes (an increase of about 8 percent) for a trip beginning at 7:00 AM, three minutes for a trip beginning at noon (an increase of 12 percent), and about 12 minutes (and increase of 31 percent) for someone leaving Seattle at 4:00 PM.



Source: Central Puget Sound Freeway Network Usage and Performance (WSDOT and TRAC, 1999 Update, Volume 1), <http://depts.washington.edu/trac/research/reports.html>

**Figure 2-9. Average Weekday Travel Time on Interstate 5 - SR 526 Interchange to Seattle CBD, General Purpose Lanes (23.7 mi) – Southbound**



Source: Central Puget Sound Freeway Network Usage and Performance (WSDOT and TRAC, 1999 Update, Volume 1), <http://depts.washington.edu/trac/research/reports.html>

**Figure 2-10. Average Weekday Travel Time on Interstate 5 - Seattle CBD to SR 526 Interchange, General Purpose Lanes (23.7 mi) – Northbound**

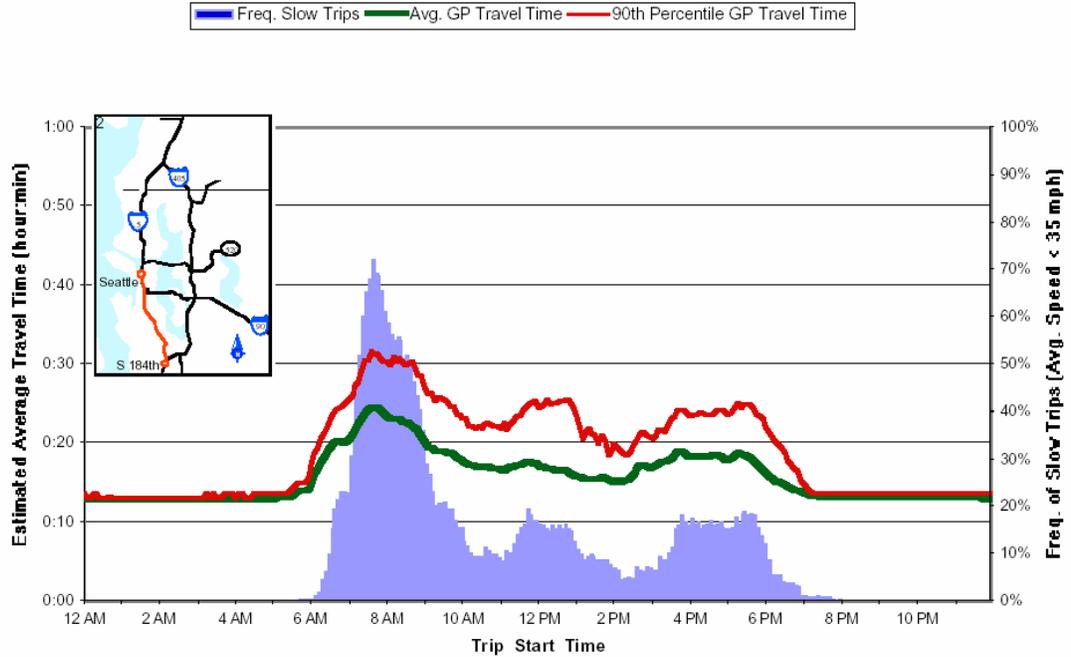
In addition to travel time, Central Puget Sound Freeway Network Usage and Performance report includes a column graph superimposed on the figures, measured along the right vertical axis, which illustrates the estimated frequency of a “slow trip” on the route. This frequency is measured by the likelihood that the average trip speed would be below 35 mph for a given trip start time. In Figure 2-9, the frequency of 57 percent at 7:00 AM indicates that there is about a 57 percent chance that the average overall trip speed would be less than 35 mph when the trip starts at 7:00 AM. In comparison, there is a 5 percent chance of a “slow trip” at noon and a 15 percent chance at 4:00 PM. In Figure 2-10, there is a 0 percent chance of a “slow trip” at 7:00 AM and noon, and a 35 percent chance at 4:00 PM.

Figure 2-11 and Figure 2-12 show the average weekday travel time on I-5 between SeaTac and downtown Seattle for the northbound and southbound directions, respectively. Figure 2-11 shows that it takes an average of about 25 minutes for a person leaving SeaTac at 7:00 AM to travel 12.9 miles north to downtown Seattle on the I-5 mainline. The figure indicates that it takes about 17 minutes to make this trip at noon, and about 19 minutes to make this trip at 4:00 PM. The 90th-percentile travel times for this route are about 31 minutes for a trip beginning at 7:00 AM, about 25 minutes for a trip beginning at noon, and about 24 minutes for a trip beginning at 4:00 PM. At 7:00 AM, the variability of the SeaTac-to-Seattle trip is about six minutes (an increase of 24 percent) for a trip beginning at 7:00 AM, eight minutes for a trip beginning at noon (an increase of 47 percent), and about five minutes (an increase of 26 percent) for someone leaving SeaTac at 4:00 PM.

Figure 2-12 shows that it takes an average of about 15 minutes for a person leaving Seattle at 7:00 AM to travel 12.9 miles south to SeaTac on the I-5 mainline. The figure indicates that it also takes about 15 minutes to make this trip at noon, and about 20 minutes to make this trip at 4:00 PM. The 90th-percentile travel times for this route are about 17 minutes for a trip beginning at 7:00 AM, about 16 minutes for a trip beginning at noon, and about 27 minutes for a trip beginning at 4:00 PM. At 7:00 AM, the variability of the Seattle-to-SeaTac trip is about two minutes (an increase of 13 percent) for a trip beginning at 7:00 AM, one minute (an increase of 7 percent) for a trip beginning at noon, and about seven minutes (an increase of 35 percent) for someone leaving Seattle at 4:00 PM.

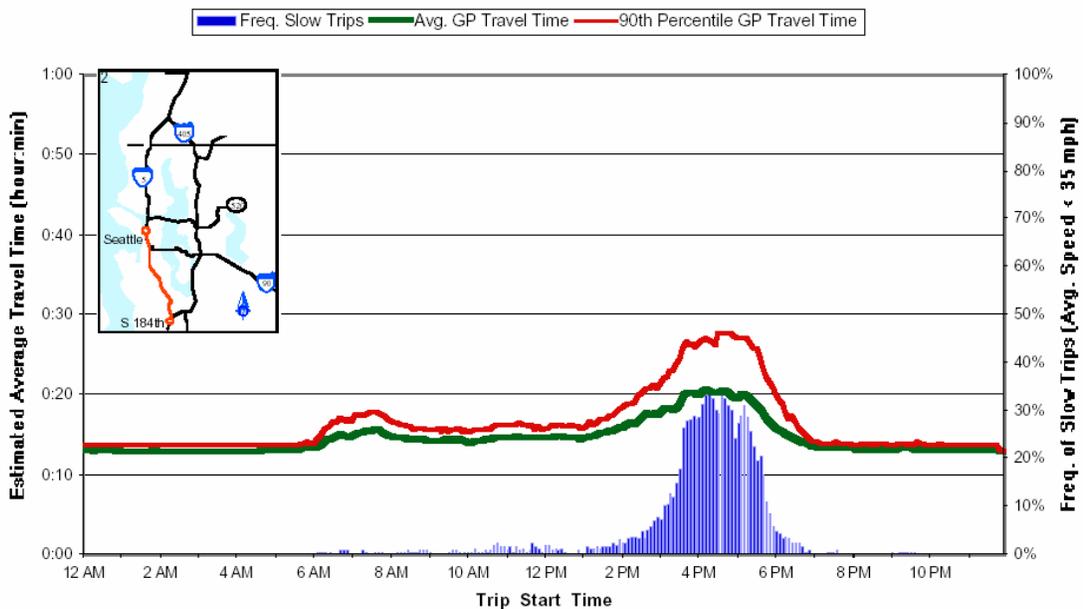
As shown in Figure 2-11, there is about a 70 percent chance that the average overall trip speed would be less than 35 mph for a trip beginning at 7:00 AM, a 15 percent chance at noon, and a 16 percent chance at 4:00 PM. In Figure 2-12, there is a 2 percent chance of a “slow trip” at 7:00 AM, a 5 percent chance at noon, and a 33 percent chance at 4:00 PM.

The variability in travel time during the morning and afternoon commute peaks, while not severe, is one reason why many truck trips are made during off-peak time periods. For comparison, a trucker who is making round trips between Seattle and Everett, the additional 12 minutes in travel time per direction means that one less round trip can be made during the course of an 8-hour day. WSDOT will continue to monitor travel times along the major freeway travel routes through Central Puget Sound. Increases in variability between an average and 90th-percentile trip would show that the system is becoming less reliable for truck movements. Peak spreading, and an increase in travel time variability during the off-peak hours, would also adversely affect the reliability of truck movements.



Source: Central Puget Sound Freeway Network Usage and Performance (WSDOT and TRAC, 1999 Update, Volume 1), <http://depts.washington.edu/trac/research/reports.html>

**Figure 2-11. Average Weekday Travel Time on Interstate 5 - SeaTac to Seattle CBD, General Purpose Lanes (12.9 mi) - Northbound**



Source: Central Puget Sound Freeway Network Usage and Performance (WSDOT and TRAC, 1999 Update, Volume 1), <http://depts.washington.edu/trac/research/reports.html>

**Figure 2-12. Average Weekday Travel Time on Interstate 5 - Seattle CBD to SeaTac, General Purpose Lanes (12.9 mi) - Southbound**

### 3. INTELLIGENT TRANSPORTATION SYSTEM COMPONENTS

Intelligent transportation systems, or ITS, monitor and manage traffic flow, reduce congestion, suggest alternate routes to travelers, and provide tools for transportation professionals to collect, analyze, and archive data about system performance during peak use hours. The I-5 corridor in central King County and southwest Snohomish County has a significant number of ITS investments. For instance, ITS investments in the I-5 corridor now extend from southwest Snohomish County to the south end of King County. Much of the state's investment in ITS began in this section of I-5 and continues to expand.

The following is an inventory of ITS investments in the I-5 corridor between SR 599/Interurban Avenue S. (King County) to the south and 220th Street SW (Snohomish County) to the north. The inventory features the following ITS elements:

- Traffic Data Collection/Traveler Information
- Closed Circuit Television Cameras (CCTV)
- Dynamic Message Signs
- Ramp Meters
- Highway Advisory Radio
- Other non-WSDOT ITS investments

#### 3.1 TRAFFIC SYSTEMS MANAGEMENT CENTER

A central component of the ITS system in the I-5 corridor is WSDOT's Northwest Region Traffic System Management Center, or TSMC. Commonly referred to as the Dayton office, the traffic management center is located in the city of Shoreline, Washington. The TSMC contains the hardware and software needed to operate and maintain various ITS elements. The TSMC houses computers, television monitors and radio dispatch equipment to meet WSDOT's operating requirements for the freeway systems and other systems that indirectly affect freeway operations. From this center, WSDOT staff manages variable-message signs, highway-advisory radio signs, ramp meters, closed-circuit television cameras, radio transmitters, traffic sensors, data accumulators, and hundreds of miles of fiber-optic cable to help them keep track of what's happening on the roads.

Planning is underway to upgrade the Dayton TSMC. The TSMC has effectively reached the end of its useful life and it must be upgraded to meet the demanding needs of the 21<sup>st</sup> century. Key operations functions will continue to require WSDOT to maintain linkages among other WSDOT offices and satellite functions as well as local transportation-related operators and research entities, including, but not limited to King, Snohomish and Pierce counties, local transit agencies, the University of Washington, Washington State University, and local cities and towns.

#### 3.2 COMMUNICATIONS

Maintaining communications during re-paving projects will be critical for WSDOT. The communications backbone upon which all ITS components connect to must remain intact during construction so that ITS data and WSDOT back office functions are not impaired. As shown in Figure 3-1, fiber optic links generally follow the Interstate and major state highway rights-of-way. These fiber lines connect to communications hubs distributed through the Northwest Region area to support ITS operations.



While there is extensive coverage of fiber within King County, WSDOT plans to extend this network throughout western Snohomish County and South King County. Connections are shown to the Dayton TSMC, plus the City of Seattle and City of Bellevue Traffic Operations Centers. Links are extended to the Roanoke Incident Response Team (IRT) center, the Kent Maintenance Facility, the traffic signal shop and Corson office. The map does not reflect connections to the Washington State Patrol, King County Roads and Metro and University of Washington, although those connections are already in place.

Important communications links are provided to WSDOT's IRT to support its traffic incident management functions. The IRT is a group of trained WSDOT maintenance employees who respond to blocking incidents on the state's freeways and highways. Their primary function is to clear roads after incidents occur and assist drivers, helping to restore the normal flow of traffic as safely and quickly as possible. The IRT personnel are available 24-hours a day, seven days per week. They provide traffic control, traffic re-routing, mobile communications in the field, and incident clearance. It's anticipated that the IRT will be used extensively during the I-5 repaving projects.

### 3.3 METHODS TO COLLECT TRAFFIC DATA AND TRAVELER INFORMATION

- **Loop Detectors.** Loop detectors are extensively used in the I-5 corridor for collecting traffic data. In general, the loop detector data stations are located at approximately ½ mile intervals between interchanges. Loops are also installed on freeway ramps to monitor access and to support ramp-metering systems. The state also collects data via other means such as video detection cameras, microwave detectors and other technologies. However, the freeway loop detectors are the primary data collection apparatus used in the I-5 corridor.
- **Traffic Flow Map.** The Seattle area Traffic Flow Map is the web-based central repository site for traveler information. It contains real-time traffic conditions on most of the region's freeway system and provides linkages to CCTV, traffic congestion information, and other traveler information sites. Real-time traffic conditions expressed on the Flow Map are derived from WSDOT's loop detector network.
- **511-Phone Service.** WSDOT provides real-time traffic and weather information through its 511-phone service. The service operates in most parts of the state, including the I-5 study corridor. The 511 system allows callers to receive a variety of information, including:
  - Traffic conditions
  - Construction impacts
  - Incident information
  - Mountain pass conditions
  - State's ferry system information
  - 800 numbers for passenger rail and airlines
  - Weather

The system operates with state-of-the-art speech recognition technology allowing callers to verbally tell the system what they want. The requested information is then "spoken" back to the user. Users can use both landline and cellular phones.

### 3.4 CLOSED CIRCUIT TELEVISION CAMERAS (CCTV)

WSDOT uses CCTV to monitor traffic conditions on the freeway system. Its primary function is to confirm and detect incidents. As a secondary function, video feeds from the camera system are provided to the Washington State Patrol, incident response teams, maintenance forces and the local media.

The following is a list of locations where there are CCTVs operating in the I-5 corridor:

#### **Snohomish County**

- 220th Street SW
- 236th Street SW

#### **King County**

- NE 205<sup>th</sup> Street
- NE 195<sup>th</sup> Street
- NE 175<sup>th</sup> Street
- NE 165<sup>th</sup> (Metro North Base)
- NE 145<sup>th</sup> Street
- NE 130<sup>th</sup> Street
- NE 117<sup>th</sup> Street
- NE Northgate Way (110<sup>th</sup>)
- NE 107<sup>th</sup> Street
- NE 92<sup>nd</sup> Street
- NE 85<sup>th</sup> Street
- NE 77<sup>th</sup> Street
- Lake City Way
- NE Ravenna Blvd.
- NE 50<sup>th</sup> Street
- NE. 45<sup>th</sup> Street (video available)
- NE 42<sup>nd</sup> Street
- Ship Canal Bridge (reversible lanes)
- Roanoke Street
- Boylston Avenue
- Mercer Street (video available)
- Mercer Street (reversible lanes)
- Denny Way
- Olive Way
- Pine Street

- Pike Street (NB & SB)
- Union Street (reversible lanes)
- University Street (NB & SB)
- Seneca Street
- Madison Street (reversible lanes)
- Marion Street
- Yesler Way
- S. Holgate Street
- S. Spokane Street
- Corson Avenue
- Albro Place (video available)
- N. Boeing Field
- S. Othello Street
- Mid Boeing Field
- S. Boeing Field
- Boeing Access Road
- Martin Luther King, Jr. Way
- Duwamish River/S. 130<sup>th</sup> Place
- SR 599/Interurban Avenue S.

### **3.5 VARIABLE MESSAGE SIGNS**

Variable message signs (VMS) are used to provide freeway users with current road and traffic conditions. Also referred to as variable or changeable message signs, VMS can be a valuable tool for informing motorists on unusual conditions such as accidents/incidents, construction and maintenance activities, reversible lane status, and traffic congestion. VMS locations in the I-5 corridor are listed below.

- NE 189<sup>th</sup> Street (southbound traffic/reversible lanes)
- NE 145<sup>th</sup> Street (reversible lanes)
- NE 135<sup>th</sup> Street (northbound)
- NE 130<sup>th</sup> Street (reversible lane lanes)
- NE 120<sup>th</sup> Street (southbound traffic/reversible lane)
- NE 110<sup>th</sup> Street (reversible lanes)
- Northgate (reversible lanes)
- NE 107<sup>th</sup> Street (reversible lanes)
- Lake City Way (reversible lanes)

- NE Ravenna Blvd. on-ramp; (southbound traffic/reversible lanes)
- South of N. 45<sup>th</sup> Street/Ship Canal (southbound traffic)
- NE 42<sup>nd</sup> Street (reversible lanes)
- Lakeview Blvd. (northbound traffic)
- Mercer Street (reversible lanes)
- Denny Way (southbound traffic)
- Howell Street onramp (reversible lanes)
- Pike Street/9<sup>th</sup> Avenue (reversible lanes)
- Columbia Street (reversible lanes)
- Cherry Street (reversible lanes)
- Downtown mainline entrance/entrance ramps (reversible lanes)
- South of S. Holgate Street (northbound traffic)
- Interurban (southbound)

### 3.6 RAMP METERS

Ramp meters are specialized traffic signals used to control the flow rate of traffic entering a freeway or similar facility. Specifically, they control the frequency with which vehicles enter the flow of traffic on the freeway, thereby reducing merge conflicts and backups. A ramp meter consists of two components: a traffic signal and a "loop detector" or traffic sensor. Most metered ramps provide for HOVs (transit vehicles and 2+ carpools/vanpools) to by-pass control of the metered signal.

Table 3-1 lists the existing I-5 on-ramp meter locations within the study corridor.

**Table 3-1. Ramp Meter Locations**

Ramp Location	Northbound		Southbound	
	Metered	HOV Bypass	Metered	HOV Bypass
220 <sup>th</sup> Street SW	✓	✓	✓	✓
236 <sup>th</sup> Street SW			✓	✓
SR 104/NE 205 <sup>th</sup> Street	✓	✓	✓	✓
N. 175 <sup>th</sup> Street	✓	✓	✓	✓
N. 145 <sup>th</sup> Street	✓	✓		
NE 130 <sup>th</sup> Street			✓	✓
Northgate Way - Eastbound	✓	✓	✓	✓
Northgate Way – Westbound	✓		✓	✓
NE 80 <sup>th</sup> Street/NE 85 <sup>th</sup> Street	✓	✓	✓	✓
NE. 70 <sup>th</sup> Street	✓			
NE Ravenna Blvd.			✓	
NE. 45 <sup>th</sup> Street	✓	✓	✓	✓

**Table 3-1. Ramp Meter Locations (continued)**

Ramp Location	Northbound		Southbound	
	Metered	HOV Bypass	Metered	HOV Bypass
E. Roanoke Street				
Boylston Ave E.			✓	
Mercer Street				
Olive Street	✓			
University Street	✓		✓	
S. Dearborn Street/4 <sup>th</sup> Avenue S.	✓		✓	
S. Spokane Street				
Columbia Way	✓	✓	✓	
S. Michigan Street/Corson Avenue	✓	✓	✓	✓
Swift Avenue S./Albro Place	✓	✓		
Boeing Access Road	✓	✓		
MLK Jr. Way			✓	✓
SR 599/Interurban	✓	✓		✓

### 3.7 HIGHWAY ADVISORY RADIO

Highway advisory radio (HAR) systems use car radios to provide information to motorists on special conditions that may impact their trip. These may include mountain pass conditions, traffic incidents or accidents, or special travel restrictions. Warning signs with beacons are placed in the I-5 corridor to direct motorists to a special AM station for further information.

HAR warning signs with beacons are located at the following locations in the I-5 study corridor:

- North of Ship Canal for southbound traffic
- North of SR 520 for northbound traffic
- S. Holgate Street for southbound traffic
- North of S. Lucille Street for northbound traffic
- South of SR 900 for southbound traffic

### 3.8 OTHER NON-WSDOT ITS INVESTMENTS

#### 3.8.1 SEATTLE DOT CCTV

The following CCTV cameras are owned and operated by the City of Seattle Department of Transportation. These cameras provide for viewing of real-time traffic operations on local arterials immediately adjacent to I-5.

- Northgate Way and 1st Avenue NE
- Fairview Avenue and Mercer Street

### 3.8.2 TRANSIT TRAVELER INFORMATION

Transit agencies have implanted the following ITS systems to help transit riders plan their transit trips:

- **Automated Trip Planner.** Trip Planner is a web-based application that provides scheduling information for transit riders using the I-5 corridor. Transit riders use this information to plan their trip by entering approximate start and end time and location information. The Trip Planner then provides the transit rider with the best itinerary for making their trip, based on the quickest route, fewest transfers, or walk distance to the nearest bus stop. Community Transit, King County Metro, and Sound Transit provide bus service in the study corridor. Trip Planner information is based on regularly scheduled service and normal traffic conditions.
- **Tracker, Real-Time Bus Arrival System.** King County Metro's web-based Tracker provides real-time bus location information for a specific time point or geographic area. Unlike traditional bus schedules, Tracker allows the transit rider to view and track the actual status of an arriving bus, so they know if the bus is on-time or late. Transit riders can use Tracker to minimize wait time at the bus stop.

Tracker provides two ways to view bus locations. The location view application provides the transit rider with real-time bus departure predictions at specific time point locations along a bus route. The map view application provides the transit rider with real-time bus location information. It displays an online map of the locations for King County Metro or King County-operated Sound Transit buses currently in service. In addition to showing bus locations, the transit rider can set an alert to notify them when it's time to leave to catch their bus.

## 4. TRANSIT SERVICES

This section describes existing public transportation services and facilities currently in place on the I-5 study corridor. The Snohomish/King County line is the north boundary and Interurban Avenue S. is the south boundary for this information.

The transit inventory addressed the following transit elements:

- Service characteristics for transit routes operating on the corridor; including major markets served, operating periods, and headways.
- Existing ridership levels expressed in terms of average daily ridership as well as average ridership by bus trip.
- On-time performance expressed in terms of minutes late.
- Transit access locations along the corridor
- Transit facilities
- Transit service plans
- Status of high occupancy vehicle (HOV) lane monitoring along the corridor.

### 4.1 CURRENT TRANSIT SERVICES

Numerous bus routes currently serve the study corridor. Appendix C describes each of the routes in terms of several major characteristics including, service markets, the extent of operations on I-5, and access locations along the study corridor. Transit access both within and outside of the downtown Seattle area is included. Appendix C also describes when transit routes operate as well as service start and finish times and service headways.

Four operators, King County Metro (Metro), Community Transit (CT), Sound Transit (ST), and the University of Washington's Health Sciences Express provide the transit routes along the study corridor. ST's routes are operated by Metro, CT, and Pierce Transit (PT). The origin of the route determines the operator. For example, since ST Routes 510, 511, and 513 originate in either Everett or Lynnwood, they are operated by CT, which is the principal public transit operator in Snohomish County.

Table 4.1 summarizes transit service along four major segments of the I-5 study corridor. The table provides the following information for each segment of the I-5 study corridor: transit operators providing service, the number of bus routes, and the total ridership for each segment. The information is grouped under the following four segments:

- NE 220th Street to Northgate
- Northgate to the Ship Canal
- Ship Canal to I-90
- I-90 to Interurban

**Table 4-1. Transit Operators and Routes Serving the I-5 Study Corridor**

Corridor Segment	Operators Serving Each Corridor Segment	Number of Routes Serving Each Corridor Segment	Weekday Ridership for Routes Serving Each Corridor Segment
1. NE 220th St to Northgate <sup>1</sup>	Metro, Community Transit, Sound Transit	8	6,353
2. Northgate to Ship Canal	Metro, Community Transit, Sound Transit, UW Health Sciences Shuttle	27	25,374
3. Ship Canal to I-90	Metro, Community Transit, Sound Transit, UW Health Sciences Shuttle	66	48,738
4. I-90 to Interurban <sup>1</sup>	Metro	14	14,588

<sup>1</sup> Only routes that stop within the corridor segment are included. ST and PT do have routes that go through this corridor segment but because they do not make any stops within the corridor they are not considered as serving the corridor segment.

Available information for existing transit services vary by each operator. Metro has passenger loads and on-time information from automatic passenger counters and updates for the data are provided on a regular basis. CT has passenger and on-time information from field counts. For ST routes operated by Pierce Transit, count information is available but no recent data is available for on-time information. Due to the variety of methods for data gathering, there is some variation in the reporting of on-time information for the transit systems serving the study corridor.

The following sections further describe services provided by Metro, CT, and ST.

#### 4.1.1 METRO

Currently, Metro routes along the study corridor provide service to a variety of markets in King County. While these markets are dispersed, Metro’s service along the study corridor is dominated by access to downtown Seattle. Very few routes operating in the corridor do not access downtown Seattle. For those routes serving downtown Seattle, several access locations are currently being used. Major downtown Seattle bus access locations to and from I-5 include the following:

- Stewart Street/Olive Street (9 routes)
- James Street (6 routes)
- S. Spokane Street (8 routes)
- Seneca Street (5 routes)
- Downtown Seattle Transit Tunnel (5 routes)

Outside of downtown Seattle, several routes access the I-5 corridor at NE 65th Street, NE 45th Street, and SR 520. Very few routes access the study corridor south of downtown Seattle.

Metro service is also characterized by a dominance routes offered only during peak periods. Of the 47 Metro routes serving the I-5 corridor, 34 operate during peak periods only. Six of the 47 routes provide service through the early evening.

Service headways (time between bus trips) for Metro Routes vary considerably – from 5 minutes to one trip per each direction. However, headways on most routes are generally between 25 minutes and 35 minutes.

Table 4-2 describes weekday ridership and average passenger loads for selected Metro routes. These routes have relatively high ridership levels that approach a substantial portion of available capacity for any bus trip. With 40-foot and articulated buses providing approximately 40 seats and 60 seats, respectively. Several of the routes are well beyond 50 percent of capacity even if articulated buses were assumed.

Table 4-3 identifies the extent of late trips on selected Metro routes serving the I-5 corridor. These routes have average late trips that exceed five minutes. Routes serving the north part of the corridor dominate this group.

**Table 4-2. Ridership for Selected Metro Routes Serving the I-5 Corridor**

Route	Service Area	Weekday Boardings	Bus Trips per Weekday	Average Boardings per Weekday Trip
41	Lake City, Downtown Seattle	5,928	174	34
71	North Seattle, Downtown Seattle	1,274	41	31
72	Lake City, U-District, Downtown Seattle	2,259	70	32
73	Jackson Park, U-District, Downtown Seattle	1,651	54	31
74	North Seattle, Downtown Seattle	154	5	31
76	North Seattle, Downtown Seattle	670	19	35
77	North Seattle, Downtown Seattle	618	19	33
101	Federal Way, Downtown Seattle	3760	98	38
133	White Center, U-District	94	3	31
143	Black Diamond, Maple Valley, Renton, Downtown Seattle	258	6	43
150	Auburn, Kent, Tukwila, Downtown Seattle	1,660	52	32
152	Enumclaw, Auburn, Federal Way, Downtown Seattle	274	9	30
158	Kent, Downtown Seattle	549	12	46
160	Tukwila, Downtown Seattle	100	3	33
162	Kent, Downtown Seattle	175	5	35
197	Federal Way, U-District	541	16	34
252	Kirkland, Downtown Seattle	220	7	31
306	Bothell, Downtown Seattle	478	11	43
304	Richmond Beach, Downtown Seattle	312	10	31
311	Woodinville, Kirkland, Downtown Seattle	551	17	32
312	Bothell, Downtown Seattle	1,318	33	40
<b>Totals</b>		<b>22,844</b>	<b>664</b>	<b>34</b>

Source: King County Metro, Spring 2004

Notes: These ridership numbers are for two-way (inbound/outbound) trips.

**Table 4-3. Metro Routes Greater than Five Minutes Late**

Route	Service Area	Direction	Highest Average Minutes Late	Affected Portion of Corridor
41	Lake City, Downtown Seattle	Inbound	6	North
72	Lake City, U-District, Downtown Seattle	Inbound	6	North
73	Jackson Park, U-District, Downtown Seattle	Outbound	7	North
76	North Seattle, Downtown Seattle	Inbound Outbound	6 10	North North
101	Federal Way, Downtown Seattle	Inbound	11	South
160	Tukwila, Downtown Seattle	Outbound	7	South
175	Federal Way, Downtown Seattle	Inbound	6	South
191	Federal Way, Sea-Tac, Downtown Seattle	Inbound	6	South
196	Federal Way, Downtown Seattle	Outbound	8	South
205	Mercer Island, U-District	Outbound	8	North
242	Bellevue, Downtown Seattle	Inbound Outbound	10 8	North North
250	Redmond, Downtown Seattle	Outbound	7	North
252	Kirkland, Downtown Seattle	Inbound	6	North
256	Kirkland, Downtown Seattle	Inbound Outbound	6 7	North North
260	Kirkland, Downtown Seattle	Outbound	7	North
261	Redmond, Bellevue, U-District, downtown Seattle	Outbound	6	North
266	Redmond, Downtown Seattle	Inbound	10	North
268	Redmond, Downtown Seattle	Inbound Outbound	6 7	North North
303	Shoreline, Seattle (First Hill)	Inbound	6	North
304	Richmond Beach, Downtown Seattle	Inbound	8	North
306	Bothell, Downtown Seattle	Inbound	6	North
311	Woodinville, Kirkland, Downtown Seattle	Inbound Outbound	7 10	North North
312	Bothell, Downtown Seattle	Inbound Outbound	11 11	North North
355	Shoreline, North Seattle, U-District, Downtown Seattle	Inbound	10	North
<b>Average for Inbound/Outbound</b>				<b>8 minutes</b>

Source King County Metro, Spring 2004 Data

## 4.1.2 SOUND TRANSIT

Currently, ST routes operating along the study corridor connect several urban areas in the region with major trip generators in downtown Seattle, the University District, and Northgate. These routes operate in express mode to allow quick connections from park-and-ride lots and transit centers located in King, Pierce, and Snohomish Counties. The Seattle CBD is the major destination along the corridor, but service is also provided to the University of Washington's Seattle campus and Northgate Mall. For ST routes serving downtown Seattle, the alignments generally follow existing major transit corridors on 2nd (southbound) and 4th Avenues (northbound).

Of the twelve ST routes serving the study corridor, five operate through late evening. Major markets served include Snohomish County and Pierce County as well as Woodinville, Redmond, and Bellevue on the east side of Lake Washington.

Within downtown Seattle, ST primarily serves Stewart Street and Olive Way. ST routes provide limited stops along the study corridor outside of downtown Seattle. Access locations include SR 520, Northgate, and NE 45th Street.

ST headways vary from less than ten minutes in peak periods (Route 590) to 45 minutes (Route 595). However, headways are generally between 20 and 30 minutes.

Table 4-4 identifies the average weekday boardings for ST routes serving the I-5 study corridor. The average load per trip varies; however, the demand is generally averages between 30 and 35 passengers per trip. Table 4-5 summarizes the on-time performance of Sound Transit routes in the corridor.

**Table 4-4. Ridership for Sound Transit Routes Serving the I-5 Corridor**

Route	Service Area	Weekday Boardings	Bus Trips per Weekday	Average Boardings Per Weekday Trip
510	Everett / Downtown Seattle	1,271	51	25
511	Lynnwood / Downtown Seattle	1,738	65	27
513	Everett / Downtown Seattle	370	8	46
522	Woodinville / Bothell / Downtown Seattle	1,888	81	23
545	Redmond / Downtown Seattle	2,740	97	28
555	Eastgate / Northgate	197	24	8
586	Tacoma/U District	419	12	35
590	Tacoma / Seattle	1,837	58	32
591	Lakewood / Tacoma Dome Station / Downtown Seattle	708	19	37
592	Lakewood / Seattle	617	20	31
594	Lakewood / Tacoma / Downtown Seattle	1,392	54	26
595	Gig Harbor/Seattle	241	9	27
	<b>Total</b>	<b>13,418</b>	<b>498</b>	<b>27</b>

2004 data; source – King County Metro, Pierce Transit, and Community Transit  
 Notes: These ridership numbers are for two-way (inbound/outbound) trips.

**Table 4-5. On-Time Information for Sound Transit Routes**

Service Area for ST Routes	Direction	Peak Period	Location	Average Minutes Late
Snohomish County	Inbound	AM Peak	Downtown Seattle	5
Snohomish County	Outbound	PM Peak	Misc. Locations	4
King County	Inbound	AM Peak	Downtown Seattle	
King County	Outbound	PM Peak	Misc. Locations	
Pierce County	Inbound	AM Peak	Downtown Seattle	9
Pierce County	Outbound	PM Peak		(information not available )

On-Time Performance (this data is incomplete; waiting for information from King County Metro for peak period information on ST routes)

### 4.1.3 COMMUNITY TRANSIT

CT serves downtown Seattle and the University District via I-5 from several communities in Snohomish County. As is the case with Metro, CT routes in the I-5 study corridor are dominated by peak period service only. Of the 31 CT routes operating in the study corridor, only three (414, 810, and 871) operate beyond the peak periods.

CT access to downtown Seattle from I-5 is primarily via Howell and Terrace Streets. Within downtown Seattle, CT routes operate along the 2nd Avenue/4th Avenue one-way couplet. All access for routes serving the University District is provided at NE 45th Street. CT routes serving the University District do not serve downtown Seattle.

For most CT routes serving downtown Seattle, headways are generally between 20 and 30 minutes. Some routes, such as No. 402, provide service every 15 minutes while others have more limited availability. For example, Route 405 provides one trip in the AM peak period and one trip every 30 minutes in the PM peak between 4:30 and 5:00.

Table 4-6 identifies the average weekday boardings for CT routes serving the study corridor. The average load per trip varies; however, the demand is generally between 20 and 40 passengers per trip on average. Table 4-7 summarizes the on-time performance of Community Transit routes in the corridor.

**Table 4-6. Ridership on Community Transit Routes Serving the I-5 Corridor**

Route	Service Area	Weekday Boardings	Bus Trips per Weekday	Average Boardings Per Weekday Trip
401	Lynnwood, Downtown Seattle	741	22	34
402	Lynnwood transit center, downtown Seattle	743	23	32
404	Edmonds, downtown Seattle	251	13	19
405	Edmonds P&R, downtown Seattle	49	3	16
406	Edmonds, Downtown Seattle	179	11	16
408	Mountlake Terrace, Downtown Seattle	335	16	21

**Table 4-6. Ridership on Community Transit Routes Serving the I-5 Corridor  
 (continued)**

Route	Service Area	Weekday Boardings	Bus Trips per Weekday	Average Boardings Per Weekday Trip
410	South Everett P&R, Downtown Seattle	343	14	25
411	South Everett, Downtown Seattle	314	12	26
412	Silver First, Downtown Seattle	703	18	39
413	Ash Way P&R, downtown Seattle	739	19	39
414	South Everett, Mountlake Terrace, Downtown Seattle	230	21	11
415	North Lynnwood, Downtown Seattle	192	15	13
416	Edmonds, Downtown Seattle	321	17	19
417	Mukilteo, Downtown Seattle	373	12	31
421	Marysville, Downtown Seattle	485	17	29
422	Stanwood, Downtown Seattle	194	6	32
424	Snohomish, Monroe, Downtown Seattle	159	7	23
435	Mays Pond, Bothell, Downtown Seattle	364	14	26
477	Brier, Mountlake Terrace, Downtown Seattle	328	14	23
810	McCollum Park, Lynnwood, Edmonds, Mountlake Terrace, U-District	325	10	33
812	McCollum Park, U-District	109	8	14
821	Marysville, U-District	109	8	14
851	Edmonds, Mountlake Terrace, U-District	317	12	26
855	Lynnwood, U-District	770	18	43
860	South Everett and U-District	543	13	42
870	Edmonds, Aurora Village, U-District	284	9	32
871	Edmonds, Mountlake Terrace, U-District	156	5	31
880	Mukilteo, Lynnwood, U-District	254	9	28
881	Mukilteo, Lynnwood, U-District	58	3	19
<b>Total</b>		<b>7,897</b>	<b>312</b>	<b>25</b>

Source: Community Transit; average weekday boardings in 2004

Notes: These ridership numbers are for two-way (inbound/outbound) trips.

**Table 4-7. On-Time Information for Community Transit Routes**

Direction	Peak Period	Location	Average Minutes Late
Inbound	AM	Downtown Seattle	6
Inbound	AM	University District	3
Outbound	PM	Misc. Locations	5

#### 4.1.4 HEALTH SCIENCES EXPRESS

The Health Sciences Express service connects the University of Washington Medical Center with Harborview Medical Center. Peak period and midday service is provided between 6:00 AM and 6:30 PM. Starting with the 6:00 AM trip, service operates every 15 minutes. The one exception is at 4:00 PM when no service is available.

The Health Sciences Express route travels on the I-5 reversible lanes. In the University District, the route accesses I-5 at NE 42nd Street while in the downtown Seattle area, access is provided at Columbia Street.

Ridership for the Health Sciences Express in 2004 averaged approximately 1,200 boardings per day. With 94 one-way bus trips per day provided by the service, there were 13 average boardings per trip. With regard to on-time performance, no information is currently available. Also, there are no current plans for expansion of the Health Sciences Express service.

#### 4.2 PARK-AND-RIDE FACILITIES

This section identifies the park-and-ride lot facilities along the study corridor and current utilization. Eight park-and-ride lots are located along the corridor, including one leased lot at Calvary Christian Assembly. Table 4-8 identifies the utilization of each lot. In total, almost 90 percent of available park-and-ride lot capacity in the I-5 study corridor is currently being used.

**Table 4-8. Park-and-Ride Lot Utilization Along I-5 Study Corridor**

Location	Percent Utilization	Spaces Available	Spaces Used
Calvary Christian Assembly Leased Lot	92%	75	69
Northgate - Transit Center Carpool Lot	89%	75	67
Northgate - Transit Center Extension	99%	417	414
Northgate Transit Center	95%	296	282
Northgate - Garage	57%	63	36
Northgate - Main Lot	82%	418	342
NE 65th St	86%	411	355
North Seattle (west of 1st Avenue NE at NE 100th Street)	60%	143	86
<b>Total</b>	<b>87%</b>	<b>1,898</b>	<b>1,651</b>

(Source: King County Metro; Park-and-Ride Lot Utilization Survey, 2nd Quarter of 2004)

### 4.3 HOV LANE PERFORMANCE

HOV lanes are provided in both directions along most of the corridor as shown in Figure 4-1. Between Northgate and I-90, the HOV lanes are included in the I-5 reversible lanes. The availability of the reversible lanes is determined by direction of peak travel. The following describes the I-5 reversible lane schedule:

#### Monday-Friday

Southbound: 5:00 to 11:00 AM

Northbound: Noon to 11:00 PM

#### Saturday and Sunday

Southbound: 7:00 AM to Noon

Northbound: 1:00 to 11:00 PM

HOV lane performance standards require operating speeds of 45 mph or greater. The HOV lane performance is summarized in terms of travel time and reliability data in the Washington Transportation Research Center's 2000 Report on HOV Lane Performance identified. The following summarizes the key findings:

- The HOV lane provides a travel time advantage (compared to the travel time in the GP lanes) between approximately 4:30 AM and 7:00 PM. The travel-time savings are greatest in the morning and decrease in midday.
- Traffic speeds in both the HOV and general-purpose lanes are low for much of the AM peak period. HOV speed and reliability falls below the state standard for about 90 minutes on average during the AM peak period.
- The HOV lane provides travel time advantages (compared to travel in the GP lanes) for southbound traffic although the advantage is less than in the northbound HOV lane. Average vehicle speed in the HOV lane slows to less than 45 miles an hour for half of the peak commute periods. In off-peak hours, the HOV lane performs with a high degree of speed and reliability.



Figure 4-1. HOV Lanes along the Study Corridor

## 5. TRUCK AND GOODS MOVEMENT

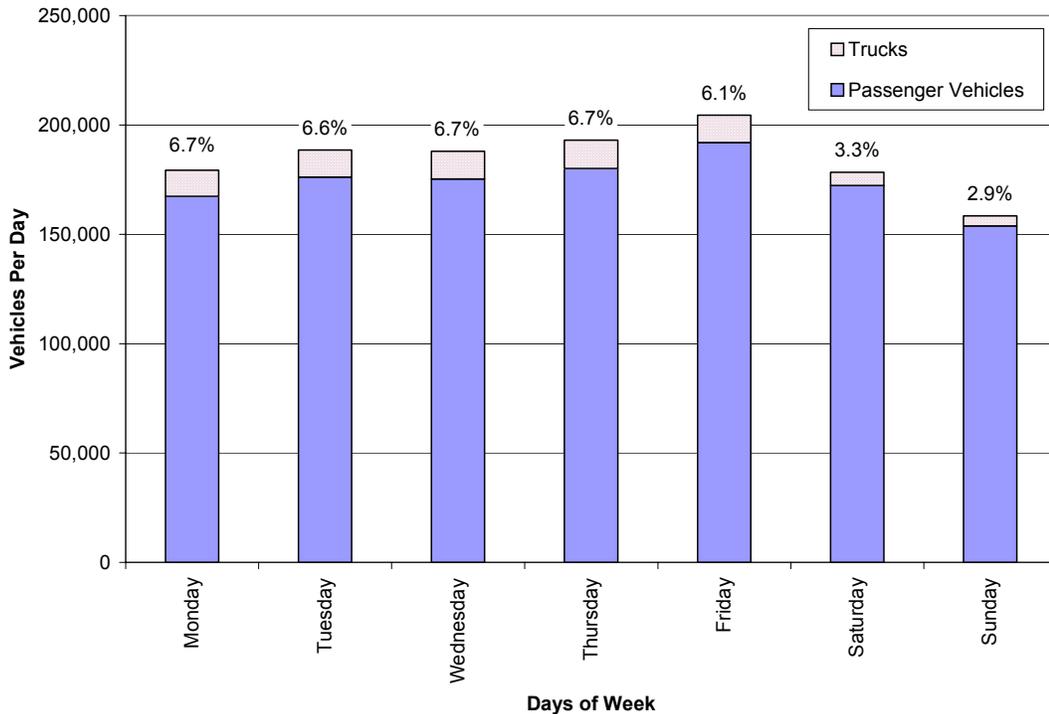
Over 12,000 trucks per weekday travel up and down I-5 in the study area with three quarters of truck movement occurring between 6:00 AM and 6:00 PM. Travel time reliability is a significant concern. With an estimated \$187.2 million in cargo per day on trucks through the I-5 weigh station at Federal Way, a reduction in delay or travel time fluctuations reduces operating cost.

### 5.1 EXISTING TRUCK VOLUMES

The WSDOT has one permanent traffic data recording station that collects traffic and truck classification data on I-5 within the study area. This station is located at NE 185th Street in Shoreline near the north end of the study area. Data collected at this station include traffic volumes and truck classifications for each hour of the day. WSDOT's traffic counts were available for October 2003.

#### 5.1.1 DAILY TRUCK VOLUMES BY DAY OF WEEK

Figure 5-1 shows the percentage of daily truck trips on I-5 by day of week. These figures show that the percentage of trucks on I-5 ranges from 6.1 percent to 6.7 percent of the total traffic volume during the week. On weekends, the truck percentage is about half of a weekday. These percentages relate to about 12,600 trucks traveling on I-5 on an average weekday (Tuesday through Thursday).



Source: Truck classification counts performed by WSDOT Permanent Traffic Recording Station P3 (I-5 at NE 185th Street), October 2003.

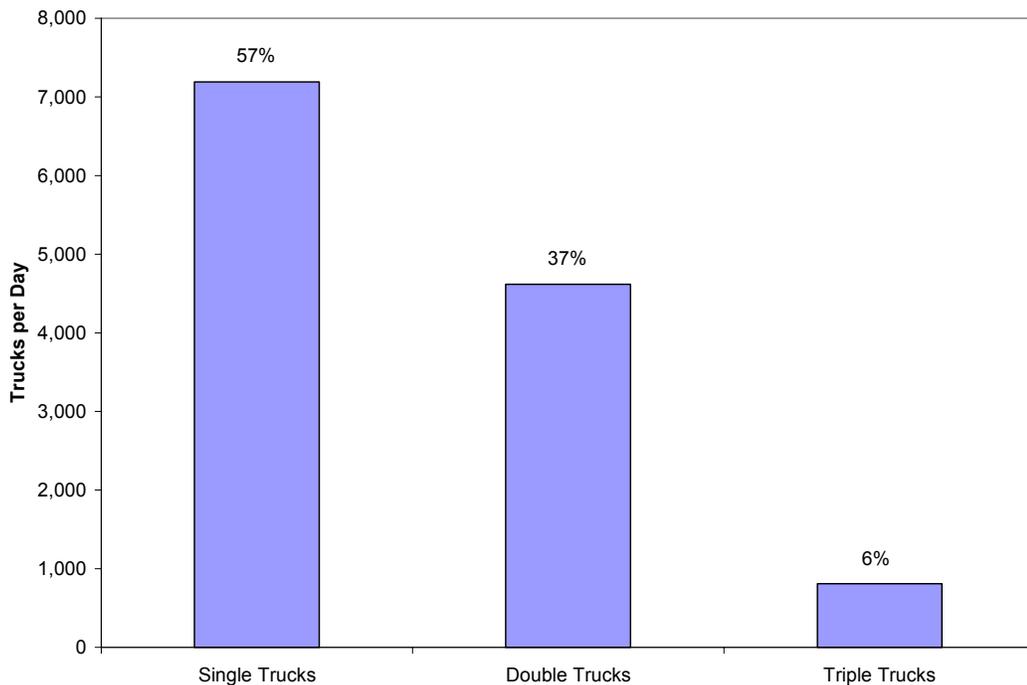
**Figure 5-1. Daily Truck Volumes per Day of Week - I-5 at NE 185th Street (October 2003)**

### 5.1.2 TRUCK VOLUMES BY TYPE

Truck volumes on I-5 are made up of three primary truck classifications:

- Single trucks with 2-to-4+ axles,
- Double trucks with 4-to-6+ axles,
- Triple trucks with 5-to-7+ axles.

Figure 5-2 shows the number of truck trips by type on an average weekday (Tuesday through Thursday) on I-5 at NE 185th Street. The data for NE 185th Street represent October 2003. The figure shows that most truck trips traveling on I-5 at these three locations are made by single trucks (11,900 or 42 percent), followed by double trucks (9,500 trucks or 33 percent), and then triple trucks (7,100 trucks or 25 percent).

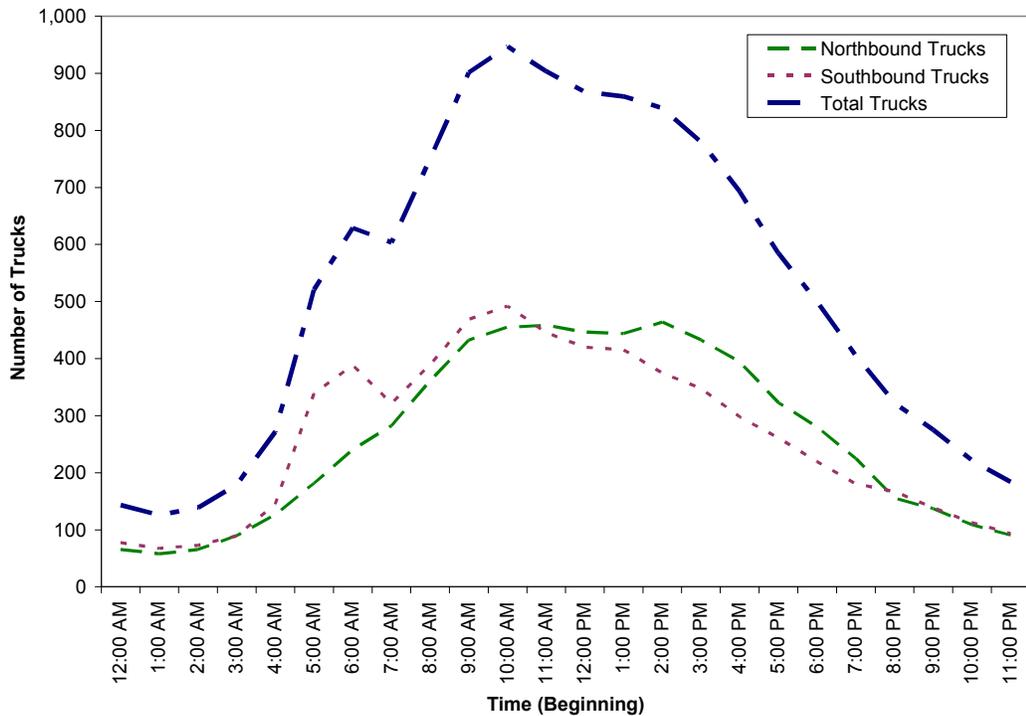


Source: Truck classification counts performed by WSDOT Permanent Traffic Recording Station P3 (I-5 at NE 185th Street) for weekdays (Tuesday, Wednesday, Thursday) in October 2003.

**Figure 5-2. Average Weekday Truck Volumes by Type**

### 5.1.3 TRUCK VOLUMES BY TIME OF DAY

Figure 5-3 displays average weekday truck volumes by time of day, and by direction, on I-5 at NE 185th Street. This figure shows that trucks are moving on I-5 primarily during regular business hours, with approximately 75 percent of all truck movements occurring between 6:00 AM and 6:00 PM. Truck volumes on I-5 begin to build around 5:00 AM, peak between about 9:00 and 11:00 AM, and then gradually diminish over the rest of the day. Southbound truck traffic surges between 5:00 and 7:00 AM, peaks between 10:00 and 11:00 AM, and then decreases over the rest of the day. Northbound truck volumes increase and then plateau between about 9:00 AM and 5:00 PM.

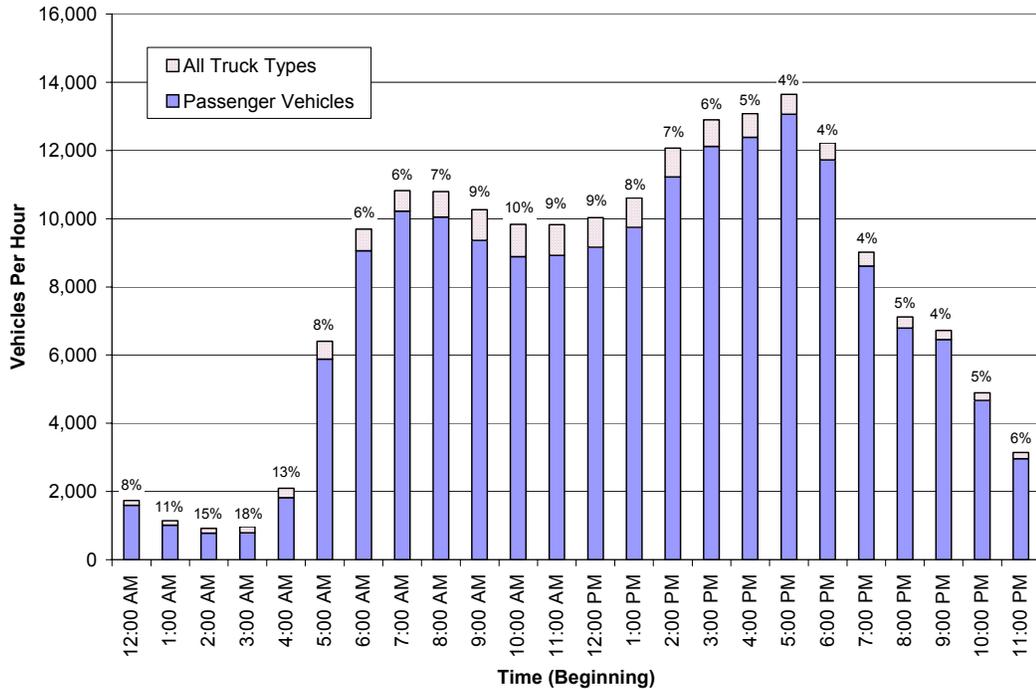


Source: Truck classification counts performed by WSDOT Permanent Traffic Recording Station P3 (I-5 at NE 185th Street for weekdays (Tuesday, Wednesday, Thursday) in October 2003.

**Figure 5-3. Average Weekday Truck Volumes by Time of Day - I-5 at NE 185th Street (October 2003)**

Figure 5-4 shows how all traffic fluctuates over the course of an average weekday on I-5 at NE 185th Street. The figure also shows the truck volumes and percentage of trucks compared to the total traffic volume. During the AM peak period (6:00 to 9:00 AM), trucks account for 6 to 7 percent of the total traffic volume; during the PM peak period (3:00 to 6:00 PM), trucks range from 4 to 6 percent of the total volume. During the middle of the day, trucks on the study area highways represent up to 10 percent of total traffic. The highest percentage of trucks occurs in the early morning hours between 1:00 and 4:00 AM, when trucks can comprise up to 18 percent of the total traffic volume.

Table 5-1 shows the number of southbound and northbound passenger vehicles and trucks (by type), and the percentage of trucks on I-5 at NE 185th Street for both the AM and PM peak hours. In addition, information from a manual count performed at Olive Way is included. This count was performed in September 2003 during the AM and PM peak periods as part of a data collection effort performed for the SR-520 Bridge Replacement project. Table 5-1 shows that there are a similar number of trucks (about 1,000) traveling southbound on I-5 at Olive Way and at NE 185th Street during the AM peak period (6:00 to 9:00 AM). However, there are about twice as many trucks traveling northbound on I-5 at Olive Way compared to NE 185th Street during the AM peak period—about 1,800 versus about 900, respectively.



Source: Truck classification counts performed by WSDOT Permanent Traffic Recording Station P3 (I-5 at NE 185th Street for weekdays (Tuesday, Wednesday, Thursday) in October 2003.

**Figure 5-4. Average Weekday Traffic Volumes and Percent Trucks by Time of Day - I-5 at NE 185th Street (October 2003)**

During the PM peak period (3:00 to 6:00 PM), there are more trucks traveling southbound on I-5 at Olive Way compared to NE 185th Street—about 1,400 versus about 900, respectively. However, northbound truck volumes are lower on I-5 at Olive Way compared to NE 185th Street during the PM peak period—about 700 versus about 1,150, respectively.

**Table 5-1. Peak Hour Volumes and Truck Percentages on I-5**

Time Interval begins at	Southbound				Northbound			
	Passenger Vehicles	Single Trucks	Double/ Triple Trucks	% Trucks	Passenger Vehicles	Single Trucks	Double/ Triple Trucks	% Trucks
<b>AM Peak Hour</b>								
<u>at NE 185th Street</u>								
6:00 AM	6444	303	85	5.7%	2621	127	114	8.4%
7:00 AM	6083	228	93	5.0%	4140	156	126	6.4%
8:00 AM	5994	251	139	6.1%	4053	208	153	8.2%
<b>Total AM Peak Period</b>	<b>18521</b>	<b>782</b>	<b>317</b>	<b>5.6%</b>	<b>10814</b>	<b>491</b>	<b>393</b>	<b>7.6%</b>
<u>at Olive Way</u>								
6:00 AM	6255	152	114	4.1%	4386	235	307	11.0%
7:00 AM	7975	191	129	3.9%	5626	298	366	10.6%
8:00 AM	7185	221	195	5.5%	5080	386	202	10.4%
<b>Total AM Peak Period</b>	<b>21415</b>	<b>564</b>	<b>438</b>	<b>4.5%</b>	<b>15092</b>	<b>919</b>	<b>875</b>	<b>10.6%</b>

**Table 5 1. Peak Hour Volumes and Truck Percentages on I-5 (continued)**

Time Interval begins at	Southbound				Northbound			
	Passenger Vehicles	Single Trucks	Double/ Triple Trucks	% Trucks	Passenger Vehicles	Single Trucks	Double/ Triple Trucks	% Trucks
<b>PM Peak Hour</b>								
<u>at NE 185th Street</u>								
3:00 PM	4831	211	136	6.7%	7291	302	130	5.6%
4:00 PM	5113	182	116	5.5%	7280	275	119	5.1%
5:00 PM	5582	157	104	4.5%	7486	222	101	4.1%
<b>Total PM Peak Period</b>	<b>15526</b>	<b>551</b>	<b>356</b>	<b>5.5%</b>	<b>22058</b>	<b>800</b>	<b>351</b>	<b>5.0%</b>
<u>at Olive Way</u>								
3:00 PM	7541	364	201	7.0%	5325	161	89	4.5%
4:00 PM	7423	306	150	5.8%	5631	112	138	4.3%
5:00 PM	7398	208	149	4.6%	6803	89	126	3.1%
<b>Total PM Peak Period</b>	<b>22362</b>	<b>878</b>	<b>500</b>	<b>5.8%</b>	<b>17759</b>	<b>362</b>	<b>353</b>	<b>3.9%</b>

Source: Truck classification counts at NE 185th Street from WSDOT, October 2003, and at Olive Way from Parametrix, September 17, 2003.

## 5.2 TRAVEL-TIME RELIABILITY

One of the most significant concerns in the trucking industry today is schedule reliability (source: Access Duwamish Truck Mobility Report, January 16, 1998, Heffron Transportation). Reliability is defined as, “a measure of the variability in delivery time for the same trip on different days.” Reliability is critical to businesses that operate with “just-in-time” delivery. It reduces the need to maintain large inventories and thus reduces costs related to storage, spoilage, and obsolescence. Just-in-time delivery only works if a business can reliably predict when the goods may arrive at the desired location.

TRAC and WSDOT recently authored Central Puget Sound Freeway Network Usage and Performance (1999 Update, Volume 1), which provides an overview of the use and performance on the primary freeways in the central Puget Sound region. This document also presents detailed travel time charts for many of these freeways, including I-5. The findings of this report are summarized in Chapter 2 (Traffic Volumes and Operations) and apply to the reliability of truck movements.

The variability in travel time during the morning and afternoon commute peaks, while not severe, is one reason why many truck trips are made during off-peak time periods. For comparison, a trucker who is making round trips between Seattle and Everett, the additional 12 minutes in travel time per direction means that one less round trip can be made during the course of an 8-hour day. WSDOT will continue to monitor travel times along the major freeway travel routes through Central Puget Sound. Increases in variability between an average and 90th-percentile trip would show that the system is becoming less reliable for truck movements. Peak spreading, and an increase in travel time variability during the off-peak hours, would also adversely affect the reliability of truck movements.

### 5.3 VALUE OF TRUCK MOVEMENTS

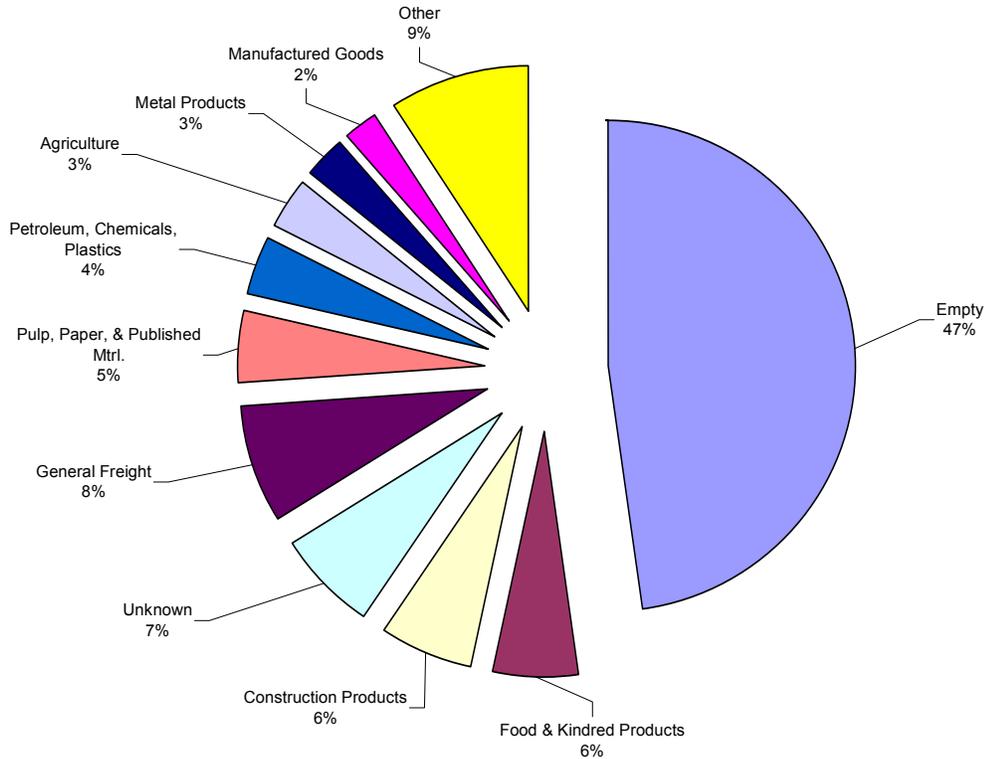
The value of cargo carried by trucks through the I-5 weigh station at Federal Way was estimated to be \$187.2 million per day in 2003. This information is based on a study performed by the WSDOT and Washington State University entitled, *Freight Movements on Washington State Highways: Results of the 2003-2004 Origin and Destination Study* (October 2004), that was performed as part of the larger *Strategic Freight Transportation Analysis (SFTA)* study. This study follows up on the *Eastern Washington Intermodal Transportation Study (EWITS)* completed in 1993/1994, which estimated that the value of trucked cargo to be approximately \$161 million per day at the Federal Way location on I-5 in 1993.

The updated report presents the findings of an extensive year-long survey assessment of freight truck movements on highways in the state of Washington. It is based upon approximately 24,000 personal interviews with truck drivers completed at 28 interview locations across the state, including Washington State Patrol weigh stations, ports of entry to the state, and Canadian border crossings. Interviews were conducted during a four-week period in each season between spring 2002 and winter 2003. When possible, data collection at each location was performed over a 24-hour period in order to develop a comprehensive freight movement profile. In the brief interviews, data were collected regarding time of day, vehicle configuration, trucking company location, trip origin, trip destination, cargo category, vehicle and cargo weight, use of intermodal facilities, and route traveled. Data obtained through the surveys were adjusted to reflect all truck trips passing each interview location and to prevent over-counting trucks with routes that pass through multiple interview locations.

The WSU/WSDOT study explored the cargo content on major Washington freight corridors, including Interstate 5, Interstate 90, Interstate 82, SR 97, and SR 395. Of these corridors, I-5 had the most diverse range of commodities being transported, reflecting the more diversified economy and larger population of western Washington. The value of this cargo is estimated based on the Bureau of the Census' 1997 Commodity Flow Survey.

The updated study found that, on an average day, there were 6,420 southbound and 5,380 northbound trucks that pass through the weigh stations near Federal Way on I-5 in 2003. This is about 45 percent more than the number of trucks traveling through these weigh stations in 1993 (a total of 8,100 trucks—3,640 southbound and 4,460 northbound), which is equivalent to an annual truck growth rate of 3.8 percent. About 48 percent of all trucks at this location were empty in 2003 (5,640), which is almost a two-fold increase compared to 1993 (2,840 empty trucks).

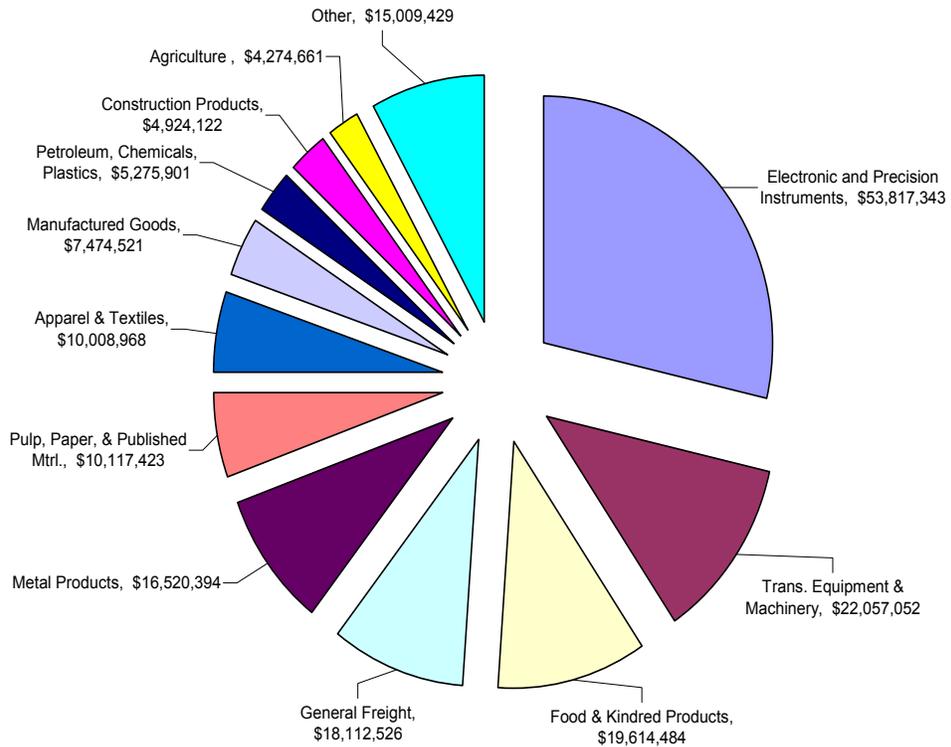
Of those trucks carrying cargo, the most significant single cargo category in 2003 was general freight. Other commodity categories accounting for a relatively high volume of trucks include food and kindred products, construction products, pulp and paper products, and petroleum and chemicals. The median cargo weight for the various commodity categories ranges from approximately 300 pounds (electronics and precision instruments) to almost 35 tons (sand and rock). Figure 5-5 shows the number of trucks by commodity on I-5 at Federal Way.



Source: Freight Movements on Washington State Highways: Results of the 2003-2004 Origin and Destination Study (WSDOT, Washington State University, and Strategic Freight Transportation Analysis Study [[www.sfta.wsu.edu](http://www.sfta.wsu.edu)], October 2004)

**Figure 5-5. Truck Movements by Commodity - I-5 at Federal Way**

In 2003, the value of the cargo carried by trucks through the Federal Way weigh stations each day was estimated to be \$94.7 million in the southbound direction and \$92.5 million in the northbound direction. This value was estimated by multiplying the total cargo tonnage by the average tonnage values for each commodity. In terms of cargo value, the most significant single cargo category is electronic and precision instruments. Other commodity categories that contribute significantly to the value of cargo moving through the area include transportation equipment and machinery, food and kindred products, general freight, metal products, pulp and paper products, apparel and textiles, and manufactured goods. Figure 5-6 shows the value of the commodities moved.



Source: Freight Movements on Washington State Highways: Results of the 2003-2004 Origin and Destination Study (WSDOT, Washington State University, and Strategic Freight Transportation Analysis Study [[www.sfta.wsu.edu](http://www.sfta.wsu.edu)], October 2004)

**Figure 5-6. Value of Truck Movements by Commodity - I-5 at Federal Way**

## 5.4 HAZARDOUS MATERIAL TRUCK MOVEMENTS

The surveys performed for the 2003-2004 Origin and Destination Study (October 2004), which were performed as part of the larger Strategic Freight Transportation Analysis (SFTA) Study (see description above), also included information about trucks carrying hazardous materials. On an average day, there were about 215 southbound trucks with hazardous materials placards that passed through the weigh station near Federal Way on I-5 in 2003, or 3.4 percent of the total number of trucks passing through the weigh station. There were about 170 trucks with hazardous material placards passing through the northbound weigh station on I-5 near Federal Way, or 3.1 percent of the total. This shows that hazardous materials are moving essentially equally from the north and the south.

## 6. TRAFFIC SAFETY AND ANALYSIS

The I-5 study corridor exceeds the Washington State average accident rate for an urban interstate, which is 1.37 accidents per MVM. An estimated accident rate of 1.4 MVM and 1.7 MVM were calculated for the northbound and southbound I-5 mainline and ramps, respectively.

WSDOT data was received for I-5 between Boeing Access Road and 220th Street SW for the years 2001 to 2003. The following summarizes the accident data by occurrences per MVM and severity of accidents for I-5 mainline, ramps, and the reversible lanes as well as some arterial intersections in the City of Seattle.

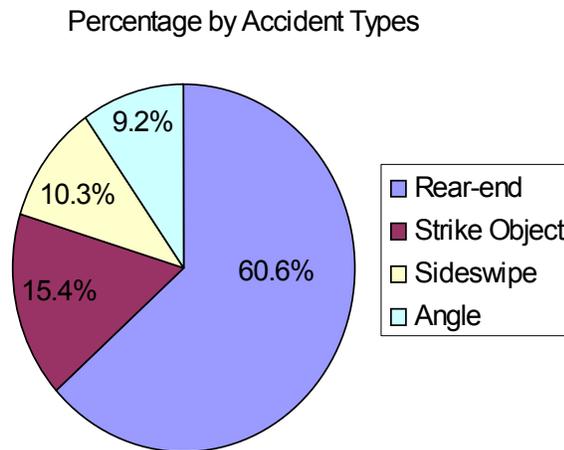
### 6.1 WSDOT SAFETY DATA

A total of 10,445 collision record summaries were received and reviewed. Twenty of those collisions, or 0.19 percent, resulted in fatalities. The most accidents in any single year during the three-year study period occurred in 2001. Also, over half of the fatalities during the study period occurred in 2001. The highest number of property damage only collisions was recorded in 2002. Table 6-1 summarizes the WSDOT accident history by year.

**Table 6-1. WSDOT Accident History - Year 2001 to 2003 between 220th Street SW and Boeing Access Road**

Year	Total Collisions	Property Damage Collisions	Total Injury Collisions	Fatal Collisions
2001	3,646	2,135	1,500	11
2002	3,479	2,221	1,252	6
2003	3,320	2,125	1,192	3
Total	10,445	6,481	3,944	20

The predominant collision type cited was rear-end (60.6%), with striking an object (15.4%) as the second most frequent collision type. Rear-end collisions are most commonly associated with congested traffic operations and hitting an object is most commonly associated with speeding.



**Figure 6-1. Percentage by Accident Type**

According to the 1996 Washington State Highway Accident Report, accident rates are reported as accidents per million vehicle miles (MVM), which is a function of the number of accidents divided by the section length and AADT per year per million vehicles traveled. Specifically, the equation used for calculating rates is:

$$\text{Accident rate} = [(\text{number of accidents}) * (1 \text{ million})] / [(\text{section length}) * (\text{AADT}) * (365 \text{ days})]$$

The average accident rate for a Washington state interstate in an urban area has steadily decreased from 1.47 in 1999 to 1.37 in 2002, while vehicle miles traveled has increased.

Table 6-2 lists calculated accident rates for various interchange areas in the study corridor. From Table 6-2, it is evident that much of the study corridor's accident rate operates above the State's average of 1.37 for an interstate located in an urban area. The area between Northgate and I-90 has an accident rate above the state average in both the northbound and southbound directions. The accident rate is particularly high for the segment between Mercer and I-90. The segment area of Northgate Way to 220<sup>th</sup> Street SW, and Interurban to I-90 operate below the State's 2002 average.

**Table 6-2. Accident Rates along the I-5 Study Corridor (Year 2001 to 2003)**

Location	Accidents per MVM	Accident per year	Length (miles)	ADT
<i>Northbound Mainline &amp; Ramps</i>				
Northgate Way to 220th Street SW	0.9	186	5.9	93,000
Mercer to Northgate Way	1.4	310	6.4	95,500
I-90 to Mercer	2.1	376	4.8	103,500
Interurban to I-90	1.3	307	6.6	96,500
<b>Total</b>	<b>1.4</b>	<b>1,179</b>	<b>24.0</b>	<b>97,125</b>
<i>Southbound Mainline &amp; Ramps</i>				
Northgate Way to 220 <sup>th</sup> Street SW	0.8	161	5.9	93,000
Mercer Street to Northgate Way	2.1	462	6.4	95,500
I-90 to Mercer Street	3.2	578	4.8	103,500
Interurban Avenue S. to I-90	0.8	194	6.6	96,500
<b>Total</b>	<b>1.7</b>	<b>1,395</b>	<b>24.0</b>	<b>97,125</b>

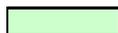
The Washington State Department of Transportation categorizes highway accident data in the following manner:

- **High Accident Location.** Spot locations less than a mile long with a higher than average rate of severe accidents in the past 2 years.
- **Pedestrian Accident Location.** Spot locations (0.10 mi or less) that have 4 accidents in a 6-year period.
- **High Accident Corridor.** Sections of state highway one of more miles long, with a higher than average number of severe accidents over a continuous period of time.

Table 6-3 lists the High Accident Locations identified for the year 2004 within the I-5 study area.

**Table 6-3. I-5 High Accident Locations**

Year	Type	SR	Mi. Begin	Mi. End	Location Title
2004	HAC	005	154.500	156.490	Southcenter I/C to NPS Duwamish River Br
2004	HAL	005	154.520	154.670	WB Off Ramp to Southcenter Blvd from I-405 Ramp to I-5 NB
2004	HAL	005	160.630	160.920	NB Off Ramp to Swift Ave
2004	HAL	005	160.920	161.010	Swift Ave between Off and On Ramps
2004	HAL	005	161.000	161.390	NB On Ramp from Swift Ave
2004	HAL	005	161.230	161.650	NB Off Ramp to Corson Ave
2004	HAL	005	161.250	161.770	NB On Ramp from Corson Ave/Michigan St
2004	HAL	005	161.430	162.240	SB Off Ramp to Corson Ave/Michigan St
2004	HAL	005	162.790	162.900	SB On Ramp from 6th Ave
2004	HAL	005	162.910	163.300	NB On Ramp from Columbian Way
2004	HAL	005	164.220	164.500	NB Off Ramp to WB I-90
2004	HAL	005	164.620	164.780	SB Off Ramp to S Dearborn St
2004	HAL	005	164.800	164.870	NBCD Vic Ramps from EB & WB I-90
2004	HAL	005	164.900	167.520	SB Mainline - S King St to N of Boylston Ave
2004	HAL	005	165.650	166.060	NB On Ramp from University St
2004	HAL	005	166.400	167.020	SB On Ramp from Mercer St
2004	HAL	005	166.420	167.000	NB Off Ramp to Mercer St
2004	HAL	005	166.620	167.160	SB Off Ramp to Mercer St
2004	HAL	005	168.980	169.380	SB On Ramp from NE 45th
2004	HAL	005	170.540	171.040	NB Reversible Off Ramp to SR 522
2004	HAL	005	171.260	171.560	SB On Ramp from NE 85th
2004	HAL	005	171.490	171.500	NE 85th St within I-5 I/C
2004	HAL	005	171.500	171.760	SB Off Ramp to WB N 85th St
2004	HAL	005	172.440	172.790	SB On Ramp from Northgate Way
2004	HAL	005	172.760	172.940	SB Off Ramp to WB Northgate Way
2004	HAL	005	173.510	173.830	NB Off Ramp to NE 130th
2004	HAL	005	173.830	173.830	NE 130th I/C within I-5 I/C
2004	HAL	005	174.560	174.810	SB Off Ramp to NE 145th
2004	HAL	005	174.600	175.000	NB On Ramp from 5th Ave NE
2004	HAL	005	175.790	176.160	NB Off Ramp to NE 175th
2004	HAL	005	176.130	176.600	NB On Ramp from NE 175th
2004	HAL	005	177.170	178.270	SB On Ramp from 236th St SW
2004	HAC	005	179.000	179.990	220th St SW I/C Vic
2004	HAL	005	179.280	179.520	SB Off Ramp to 220th St SW

 Project Area

The following provides a summary of the collision data by area along the I-5 mainline. The sub areas include:

- Interurban Avenue S. to I-90
- I-90 to Mercer Street
- Mercer Street to Northgate Way
- Northgate Way to 220th Street SW

Besides the I-5 mainline, other facilities evaluated included the reversible lanes and the CD roadway.

For most sub areas, the data were separated by direction (northbound or southbound) and area (ramp or mainline). A ramp area was designated as 0.06 miles upstream and downstream from the actual ramp milepost number (state milepost log). This is based on the assumption that accidents due to ramp friction occur within the area of the ramp, rather than at an exact milepost. The reversible lanes and CD areas were separated by direction only.

For a complete summary of the accident data, refer to Appendix D.

### 6.1.1 I-5 NORTHBOUND MAINLINE AND RAMPS

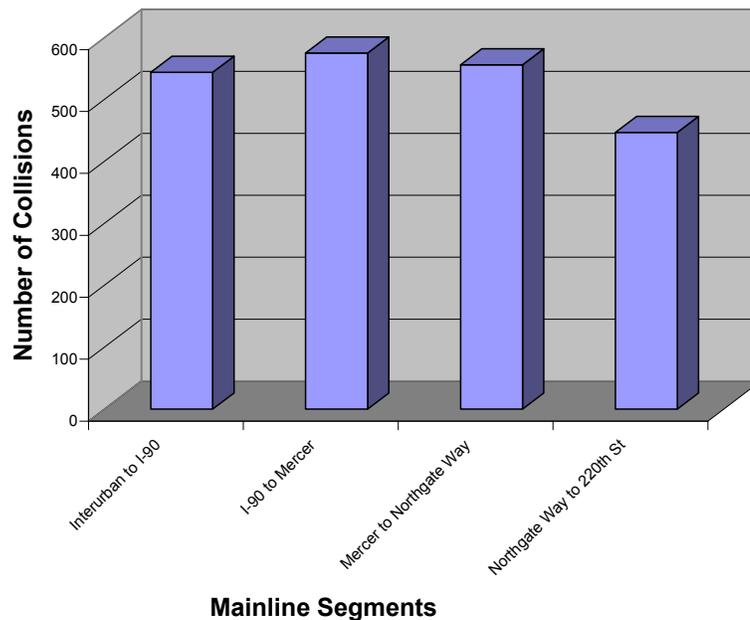
For the four segment areas of Interurban Avenue S. to I-90, I-90 to Mercer Street, Mercer Street to Northgate Way, and Northgate Way to 220th Street SW nearly 1,200 collisions were reported per year in the northbound direction during the three-year period. Table 6-4 summarizes the northbound mainline and ramp accident history.

**Table 6-4. I-5 Northbound Mainline and Ramp Accident Summary**

Location	Accidents per MVM	Accident per year	Length (miles)	ADT
Northgate Way to 220th Street SW	0.9	186	5.9	93,000
Mercer to Northgate Way	1.4	310	6.4	95,500
I-90 to Mercer	2.1	376	4.8	103,500
Interurban to I-90	1.3	307	6.6	96,500
Total	1.4	1,179	24.0	97,125

The northbound mainline segment with the highest accident rate is between I-90 and Mercer Street. This subarea falls within the Seattle central business district where high traffic volumes and congested facilities are observed often. This segment area has a large number of ramps within a short distance, left-hand exits, add- and drop-lanes, poor signage at the Seneca Street off-ramp, a mainline bottleneck to two through lanes, and substandard shoulder widths.

For the Carleton/Michigan to Spokane Street area, congestion can be observed frequently. High weaving volumes can also be seen in this area. Currently there is a drop lane at the West Seattle Bridge and an add-lane from the West Seattle Bridge which then becomes a drop lane at I-90. Figure 6.2 shows the number of mainline collisions per segment of I-5.



**Figure 6-2. Northbound I-5 Mainline Accidents**

Similar to the mainline, the highest number of accidents was observed in the segment between I-90 and Mercer Street. The numerous ramps that are closely spaced, coupled with high volumes could contribute to the larger number of accidents reported. Figure 6.3 shows the number of ramp related collisions per the segment of I-5.

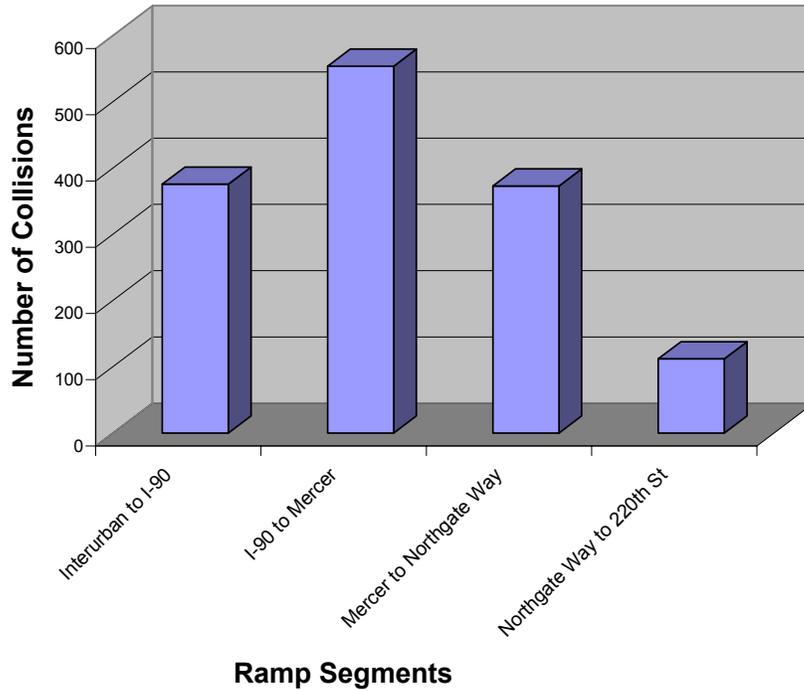


Figure 6-3. Northbound I-5 Accidents within the Vicinity of Ramp Termini

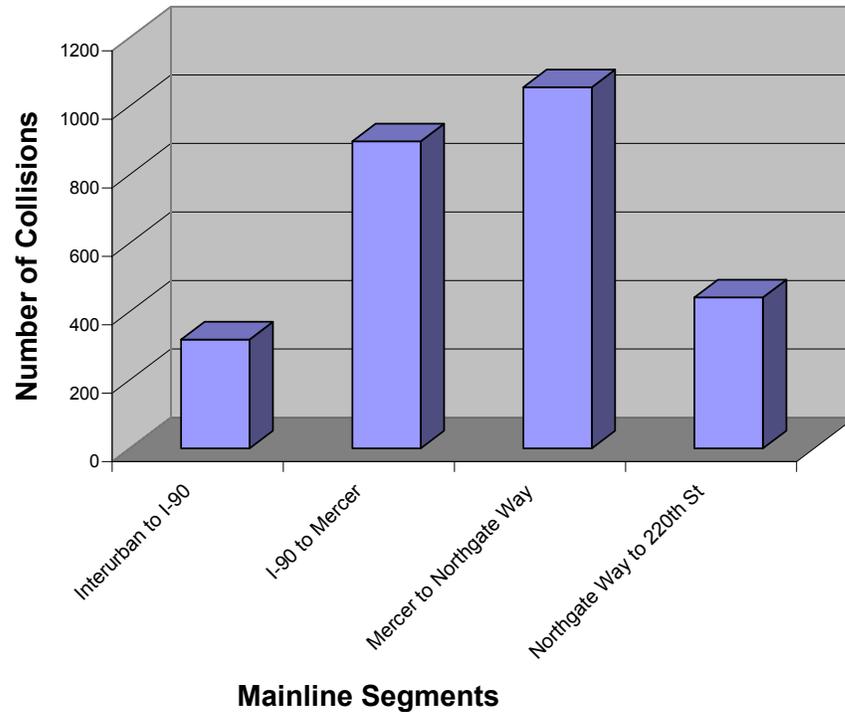
### 6.1.2 I-5 SOUTHBOUND MAINLINE AND RAMPS

For the four segment areas of Interurban Avenue S. to I-90, I-90 to Mercer Street, Mercer Street to Northgate Way, and Northgate Way to 220th Street SW nearly 1,400 collisions were reported per year. Table 6-5 summarizes the accident rate per MVM for these segments. Table 6-5 summarizes the southbound mainline and ramp accident history.

Table 6-5. I-5 Southbound Mainline and Ramp Accident Summary

Location	Accidents per MVM	Accidents per year	Length (miles)	ADT
Northgate Way to 220th Street SW	0.8	161	5.9	93,000
Mercer Street to Northgate Way	2.1	462	6.4	95,500
I-90 to Mercer Street	3.2	578	4.8	103,500
Interurban Avenue S. to I-90	0.8	194	6.6	96,500
Total	1.7	1,395	24.0	97,125

Similar to the northbound mainline, I-90 to Mercer Street has the highest accident rate per MVM. The area has several ramp merge and diverge sections as well as left and right side ramps, which increases conflict points. Figure 6.4 shows the number of mainline collisions per segment of I-5.



**Figure 6-4. Southbound I-5 Mainline Accidents**

The segment from Mercer Street to Northgate Way had the highest number of collisions when compared to the other subareas. This area consistently has high volumes during the peak periods and contains several weaving areas. Weaving areas include the interchanges at Northgate Way, Lake City Way/Ravenna, NE 45th/50th Streets, SR 520 and Mercer Street, the existing infrastructure layout likely contributes to a congested facility and higher collision occurrences. At the Northgate interchange area, a forced merge to the right occurs during closed reversible lane operations.

Similar to the mainline, the segment with the highest number of ramp-related collisions related to on-and off- ramps is from Mercer Street to Northgate Way. Figure 6.5 shows the number of ramp related collisions per segment of I-5.

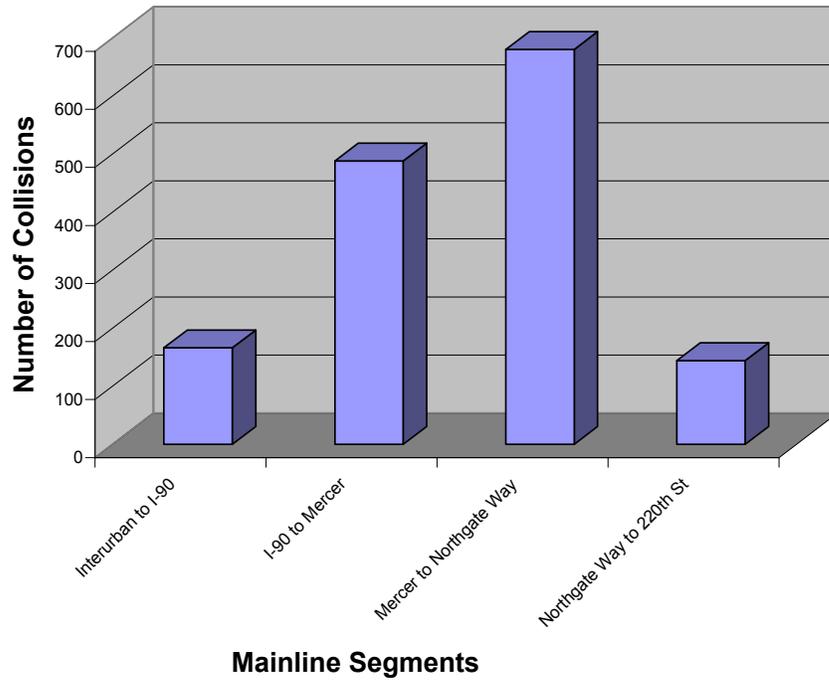
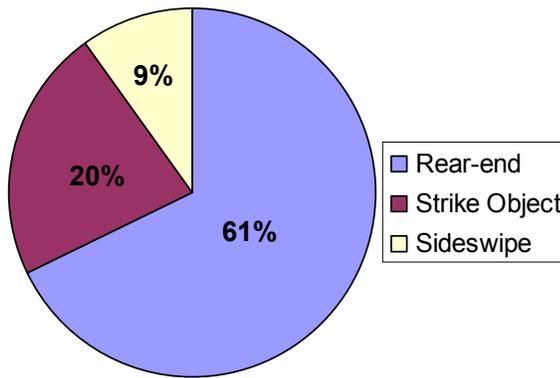


Figure 6-5. Southbound Accident within the Vicinity of Ramp Termini

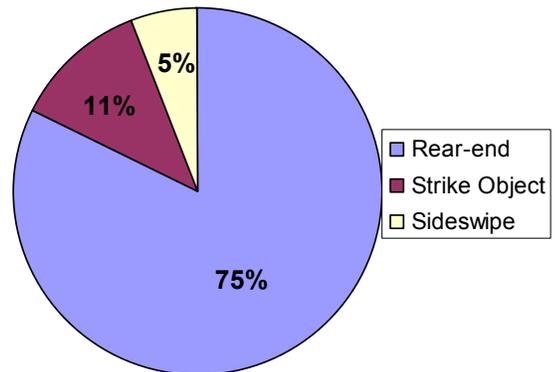
### 6.1.3 REVERSIBLE LANES

The reversible lanes operate in the northbound direction during the PM peak period and in the southbound direction during the AM peak period. Figure 6-6 depicts accident types by percent of total accidents for the northbound and southbound reversible lanes.

Northbound Reversible Lanes



Southbound Reversible Lanes



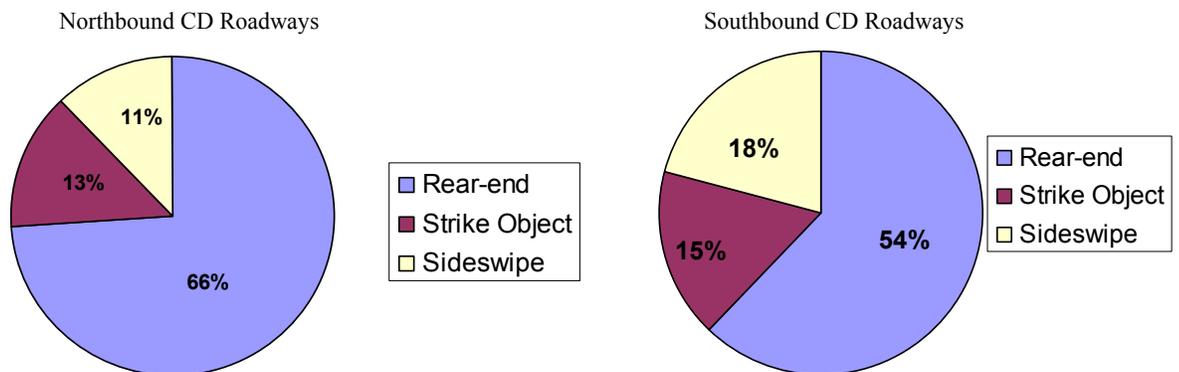
Figures 6-6. Percent Accident Type, Reversible Lanes

Over 75 percent of the accidents occurring on the reversible lanes in the southbound direction are rear-end related accidents. This is primarily due to congested facilities. Many of the accidents occurred in the downtown area, where there are high traffic volumes, but also where the reversible lanes terminate and merge into general-purpose lanes. This area is often congested and likely contributes to the high number of rear-end collisions observed.

Most of the accidents occurring in the northbound direction along the reversible lanes occur near the terminus of the lanes, in the vicinity of Northgate Way. The reversible lane traffic merges back into the general-purpose lanes and substantial queues are often observed near the terminus of the reversible lanes. The predominant accident type of rear-end collisions suggests that these collisions are related to congestion.

### 6.1.4 COLLECTOR-DISTRIBUTOR ROADWAY

Several CD roadway facilities are located in the study corridor. The most significant system is the downtown Seattle CD, located in the heart of downtown Seattle and serves a key function providing access to and from downtown Seattle. Other highly utilized CD roadways include Northgate Way (southbound direction only), SR 104 (northbound direction only), and the Boeing Access Road (northbound direction only). Figure 6-7 depicts accident types by percent of total accidents for the northbound and southbound CD roadways.



Figures 6-7. Percent Accident Type, CD Roadways

The CD roadway system in downtown Seattle is the longest and highest volume CD system in the study corridor. The downtown CD provides access to many of the downtown Seattle on- and off-ramps, and high volumes exist during peak periods.

In both the northbound and southbound direction, the predominate accident type was rear-end collisions, which is often associated with congested facilities.

Northgate CD roadway operates in the southbound direction and over the three-year period, had just over twenty collisions reported. Rear-end and striking an object had the highest frequency of accident types, just fewer than 30 percent.

The most frequent collision type for the SR 104 CD roadway was rear-end, and for the Boeing Access Rd CD it was striking an object. The SR 104 collision type could be due to congestion; however the Boeing Access Rd CD may have design issues such as sight distance or non-standard lane/shoulder widths that may contribute to the high number of collision with objects.

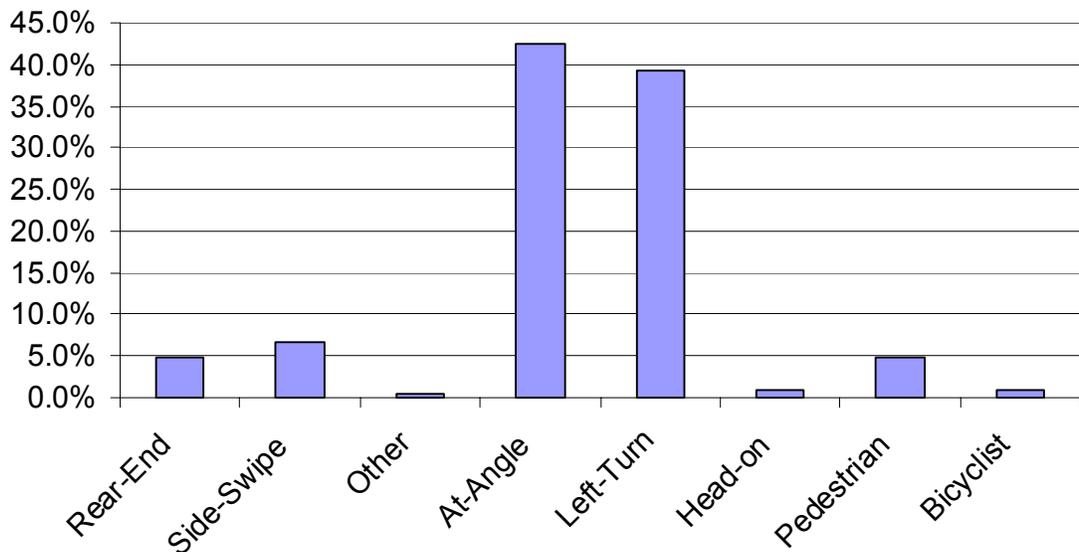
## 6.2 CITY OF SEATTLE

The City of Seattle’s Department of Transportation provided accident data for signalized and unsignalized intersections within the study area considered to be HALs. Data were collected for 2001, 2002, and 2003. Although accident type was listed in the report, it was not stated whether the accident was caused by a red light violation or if any injuries and/or fatalities occurred.

Data was supplied for seven signalized intersections. These intersections are all located near an interchange with I-5. A combined total of 212 collisions were reported during the three periods for all signalized intersections. There were no fixed objects accidents reported here. The signalized intersections were:

- I-5 Corliss NR RP and N Northgate Way
- Boren Avenue and Olive Way
- 5th Avenue and Spring Street
- 6th Avenue and Cherry Street
- 6th Avenue and James Street
- Airport Way S. and Corson Avenue S
- Corson Avenue S. and Michigan Street

Figure 6-8 shows it becomes evident that the highest accident type observed was at-angle and left-turn related accidents. The high occurrence of both types of accidents is likely due to red-light violation.



**Figure 6-8. Signalized Intersections: Percentage by Accident Type**

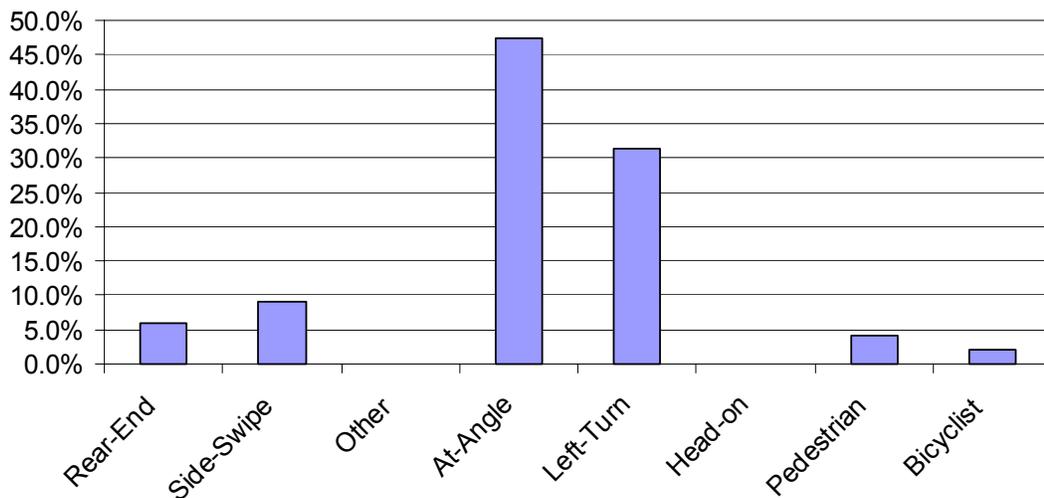
The signalized intersection with the highest number of accident in the three-year period was at 6th Avenue and James Street, which is located within the Seattle CBD and near the I-5 interchange. Most of the accidents involving pedestrians and bicyclists occurred in the Seattle CBD, where non-motorized activity is highest in relation to other areas in the study corridor. Please refer to Table 6-6 for a breakdown of accidents by location, year and type for signalized intersections.

Data were also supplied for eight unsignalized intersections. These intersections are all located near an I-5 interchange. A combined total of 99 collisions were reported during the three periods for all the unsignalized intersections. There were no fixed objects accidents reported here. The unsignalized intersections were:

- Meridian Avenue N. and N. 107th Street
- Roosevelt Way NE and NE 73rd Street
- 8th Avenue NE and 70th Street on ramp to I-5
- 8th Avenue NE and NE 45th Street
- 6th Avenue and Yesler Way
- 7th Avenue and Spring Street
- John Street and Yale Avenue
- 13th Avenue S. and Airport Way S

Similar to the signalized intersections, the most frequent accident types were at-angle and left-turn collisions. These are likely due to disregarding right-of-way rules at unsignalized intersections.

For the three-year period, the Meridian Avenue/107th Street intersection experienced the highest number of accidents with 17. Although a small number of pedestrian related collisions were reported, these collisions occurred either in the Seattle CBD or near the University of Washington. Both of these areas are considered to generate high non-motorized activity. Figure 6-9 shows the percent of total accidents by accident type for unsignalized intersections.



**Figure 6-9. Unsignalized Intersections: Percentage by Accident Type**

**Table 6-6. Accident Rates by Year and Type at Select Signalized Intersections**

	Year	Total	Rear-End	Side-Swipe	Other	At-Angle	Left-Turn	Head-on	Pedestrian	Bicyclist
5TH AVE AND SPRING ST	2001	13				10			2	1
	2002	12	1			7	2		2	
	2003	14				10	2		2	
	total	39	2.6%	0.0%	0.0%	69.2%	10.3%	0.0%	15.4%	2.6%
6TH AVE AND CHERRY ST	2001	3		1	1	1				
	2002	11		2		6	1		1	1
	2003	7	1	1		3	1		1	
	total	21	4.8%	19.0%	4.8%	47.6%	9.5%	0.0%	9.5%	4.8%
6TH AVE AND JAMES ST	2001	12	1			1	10			
	2002	16				5	10	1		
	2003	32	3	3		4	22			
	total	60	6.7%	5.0%	0.0%	16.7%	70.0%	1.7%	0.0%	0.0%
AIRPORT WAY S AND CORSON AVE S	2001	10		2		1	7			
	2002	2					2			
	2003	5					5			
	total	17	0.0%	11.8%	0.0%	5.9%	82.4%	0.0%	0.0%	0.0%
BOREN AVE AND OLIVE WAY	2001	10				9			1	
	2002	12				8	3	1		
	2003	14	1			11	2			
	total	36	2.8%	0.0%	0.0%	77.8%	13.9%	2.8%	2.8%	0.0%
CORSON AVE S AND MICHIGAN ST	2001	4				3	1			
	2002	11		1		4	6			
	2003	7				1	6			
	total	22	0.0%	4.5%	0.0%	36.4%	59.1%	0.0%	0.0%	0.0%
I5 CORLISS NR RP AND N NORTHGATE WAY	2001	11	2	3		5	1			
	2002	1				1				
	2003	5	1	1			2		1	
	total	17	17.6%	23.5%	0.0%	35.3%	17.6%	0.0%	5.9%	0.0%
<b>GRAND TOTAL - SIGNALIZED US</b>		<b>212</b>	<b>10</b>	<b>14</b>	<b>1</b>	<b>90</b>	<b>83</b>	<b>2</b>	<b>10</b>	<b>2</b>

**Table 6-6. Accident Rates by Year and Type at Select Signalized Intersections (continued)**

	Year	Total	Rear-End	Side-Swipe	Other	At-Angle	Left-Turn	Head-on	Pedestrian	Bicyclist
13TH AVE S AND AIRPORT WAY S	2001	5		1		1	3			
	2002	7					7			
	2003	4				1	3			
	total	16	0.0%	6.3%	0.0%	12.5%	81.3%	0.0%	0.0%	0.0%
6TH AVE AND YESLER WAY	2001	7		1		3	1		2	
	2002	4				3	1			
	2003	1				1				
	total	12	0.0%	8.3%	0.0%	58.3%	16.7%	0.0%	16.7%	0.0%
7TH AVE AND SPRING ST	2001	4				4				
	2002	7		1		6				
	2003	2				1	1			
	total	13	0.0%	7.7%	0.0%	84.6%	7.7%	0.0%	0.0%	0.0%
8TH AVE NE AND I5 70TH ST ON	2001	5	1			3				1
	2002	3		1		2				
	2003	4	1			1	2			
	total	12	16.7%	8.3%	0.0%	50.0%	16.7%	0.0%	0.0%	8.3%
8TH AVE NE AND NE 45TH ST	2001	6	1	3			2			
	2002	2	2							
	2003	3	1				1		1	
	total	11	36.4%	27.3%	0.0%	0.0%	27.3%	0.0%	9.1%	0.0%
JOHN ST AND YALE AVE	2001	5				4	1			
	2002	1				1				
	2003	2				2				
	total	8	0.0%	0.0%	0.0%	87.5%	12.5%	0.0%	0.0%	0.0%
MERIDIAN AVE N AND N 107TH ST	2001	6				3	2			1
	2002	5				4	1			
	2003	6				4	2			
	total	17	0.0%	0.0%	0.0%	64.7%	29.4%	0.0%	0.0%	5.9%
ROOSEVELT WAY NE AND NE 73RD ST	2001	2					2			
	2002	2				1	1			
	2003	6		2		2	1		1	
	total	10	0.0%	20.0%	0.0%	30.0%	40.0%	0.0%	10.0%	0.0%
<b>GRAND TOTAL - UNSIGNALIZED I/S</b>		<b>99</b>	<b>6</b>	<b>9</b>	<b>0</b>	<b>47</b>	<b>31</b>	<b>0</b>	<b>4</b>	<b>2</b>

## 7. NON MOTORIZED PEDESTRIAN AND BICYCLE DATA

Bicycle and pedestrian paths, trails, or routes provide mobility between communities. The following summarizes the regional trails within the study area and non-motorized crossings of I-5 within the communities.

### 7.1 REGIONAL TRAILS WITHIN THE I-5 PRP STUDY AREA

Regional bicycle trails are classified as Class I, II, and III bicycle trails within the Project area.

- Class I bicycle facilities are paved and for the use of bicycles and pedestrians and have exclusive rights-of-way. Class I bicycle trails are required to be at least 10 feet wide.
- Class II bicycle facilities are within the paved area of arterials for the use of bicycles. These paved bicycle areas, or bike lanes, are striped with widths varying between 4 and 12 feet and are signed as designated bikeways.
- Class III bicycle facilities are located along existing arterials (without striping) and are intended to provide continuity within the bikeway system. Class III bicycle facilities may be supported with signs indicating their status as components of the regional bicycle system.

The region's bicycle system is shown in the King County Cycling Guide Map published by the King County Department of Transportation and the Draft Snohomish County Bicycle Plan, March 2002. Both plans are included in Appendix E.

There are seven major Class I regional bicycle facilities within the project area: the Interurban Trail, Burke-Gilman Trail, Elliott Bay Trail, Alki Trail, Duwamish Trail, I-90 Trail, and the Green River Trail. These trails are shown in Appendix E in the Cycling in King County maps and are summarized below.

- The interurban trail is located in the northern limits of the study area in Snohomish County and extends between Lake Ballinger near 226th Street SW to Madison Street in the City of Everett.
- The Burke-Gilman Trail extends from Gasworks Park in Seattle to Redmond (connecting to the Sammamish Trail).
- The Elliot Bay Trail extends between Magnolia Park and Myrtle Edwards Park approximately a mile west of I-5.
- The Alki Trail serves the Alki neighborhood and across the Duwamish Waterway to SR 99. The Duwamish Trail connects to the Alki Trail and extends south, approximately half a mile north of SR 509.
- The I-90 trail extends more than four miles from the Dearborn Street and Rainier Avenue area in Seattle to Mercer Slough in Bellevue.
- The Green River Trail crosses I-5 at Interurban Avenue at the south end of the study area and continues to Auburn.

## **7.2 NON MOTORIZED FACILITIES IN COMMUNITIES NEAR THE I-5 CORRIDOR**

The Cities of Mountlake Terrace, Shoreline, and Seattle non-motorized plans include inventories of bicycle and pedestrian paths, and bicycle lanes. The cities non motorized plans are included in Appendix F.

### **7.2.1 CITY OF MOUNTLAKE TERRACE**

The City of Mountlake Terrace land use is primarily residential but includes commercial near the I-5 corridor. The City of Mountlake Terrace Comprehensive Plan, adopted August 2003, includes a sidewalk inventory and non-motorized travel map. SR 104 and three arterials, 220th Street SW, 228th Street SW, and 236th Street SW, cross I-5 within the City and study area limits. Sidewalks exist on at least one side of the three arterials crossing I-5 as well as most the arterials within the City.

### **7.2.2 CITY OF SHORELINE**

In the City of Shoreline, the land use ranges from commercial to residential near the I-5 corridor. Sidewalk crossings of I-5 are provided at three locations: N.180th Street, N. 175th Street, and N. 155th Street. There are not any existing bicycle lanes crossing I-5 in the City of Shoreline. The existing sidewalk inventory from the 2004 City of Shoreline Draft Transportation Master Plan is shown in Appendix F. The review of bicycle lanes was provided from the Bicycling in King County maps.

### **7.2.3 CITY OF SEATTLE**

The City of Seattle publishes the Seattle Bicycling Guide Map that depicts the shared use paths, bicycle lanes, and pedestrian paths. There are four shared use paths or bicycle lanes crossings of I-5 in the City of Seattle, which occur at Ravenna Boulevard (bicycle lane), Burke Gilman Trail (shared use path), Pine Street (bicycle lane), and S. Dearborn Street (bicycle lane).

**APPENDIX A**  
**Freeway Traffic County Data**

## 2004 TRAFFIC VOLUMES

# RAMP & ROADWAY



Interstate 5



State Route 18



Interstate 90



State Route 99



State Route 167



Interstate 405



State Route 509



State Route 518



State Route 520



State Route 522



State Route 525



State Route 526



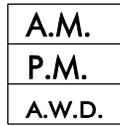
State Route 599



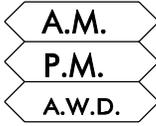
**Washington State Department of Transportation**

Northwest Region - Traffic Systems Management Center

# LEGEND



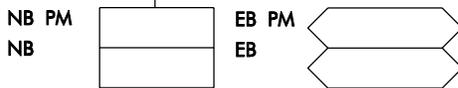
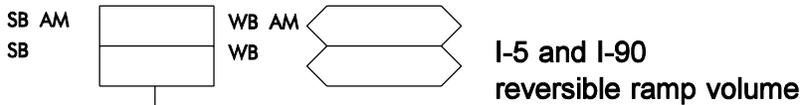
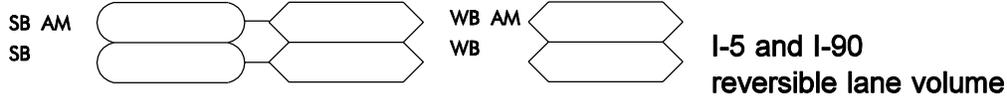
ramp volume



high-occupancy vehicle (HOV) lane volume



mainline volume  
(does not include HOV lane volume)



HOV facility



beginning or end of HOV facility



metered ramp shoulder



peak hour occurred outside of normal peak hour  
(6 to 9:45 AM or 2:30 to 6:45 PM; See Appendix)

S

speed data available at this location

T

data obtained from tube counters

A.M.

am peak hour volume

P.M.

pm peak hour volume

CONSTR

data not available due to construction

A.W.D.

average weekday volume

N.A.

data not available

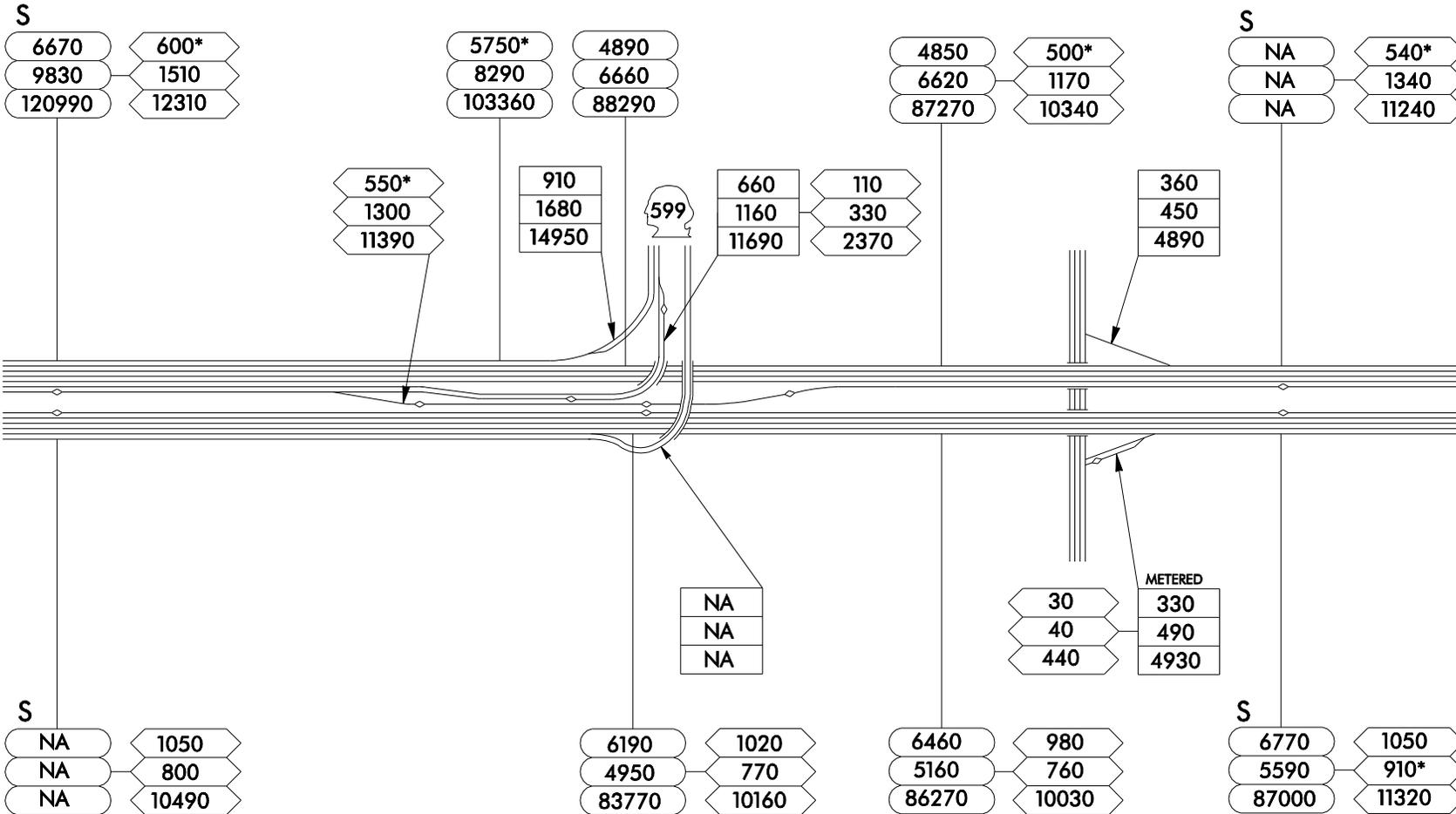


S 144TH ST

EXIT 156  
SR 599

EXIT 156  
INTERURBAN  
AVE

S 129TH ST



**EXIT 157**  
 SR 900  
 M L KING JR WAY S

**EXIT 158**  
 S BOEING  
 ACCESS RD

S NORFOLK ST

S BOEING FIELD

S THISTLE ST



4440  
5830  
77820

570\*  
1250  
11110

4990  
6760  
86640

590\*  
1290  
11420

S  
5780  
7220  
95340

1510  
1980  
24220

S  
6020  
7740  
102200

940\*  
1630  
16900

S  
6300  
7800  
98940

NA  
NA  
NA

METERED

680\*  
1110  
12930

50\*  
140  
1050

610  
990  
9210

1020\*  
2020  
20400

NA  
NA  
NA

NA  
NA  
NA

970  
2030  
17600

900

1780  
870  
13140

660  
850  
10780

600  
400  
4960

1730  
850  
12780

860  
800  
10160

METERED  
470  
690  
7010

10\*  
20  
110

510  
720  
7790

800  
430\*  
5380

5910  
4670  
79040

1120  
880  
11670

NA  
NA  
NA

1020  
800  
10610

S  
7770  
6070  
98030

1320  
820  
12070

S  
NA  
NA  
NA

1340  
960  
12680

S  
7260  
6130  
97340

1450  
850  
12570



Washington State  
 Department of Transportation



7  
 OF  
 25

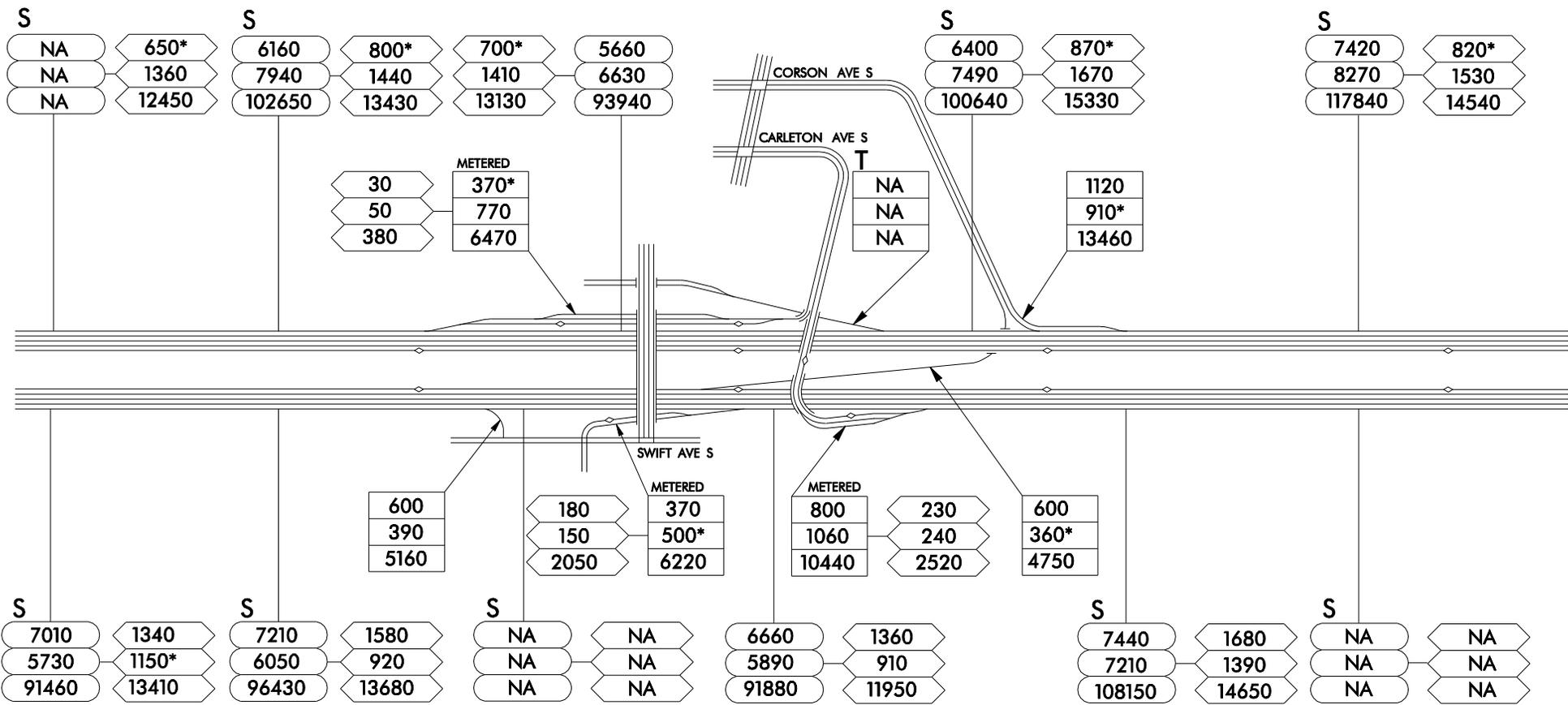


NORTH BOEING  
FIELD

EXIT 161  
ALBRO PL  
SWIFT AVE S

EXIT 162  
CORSON AVE S  
S MICHIGAN ST

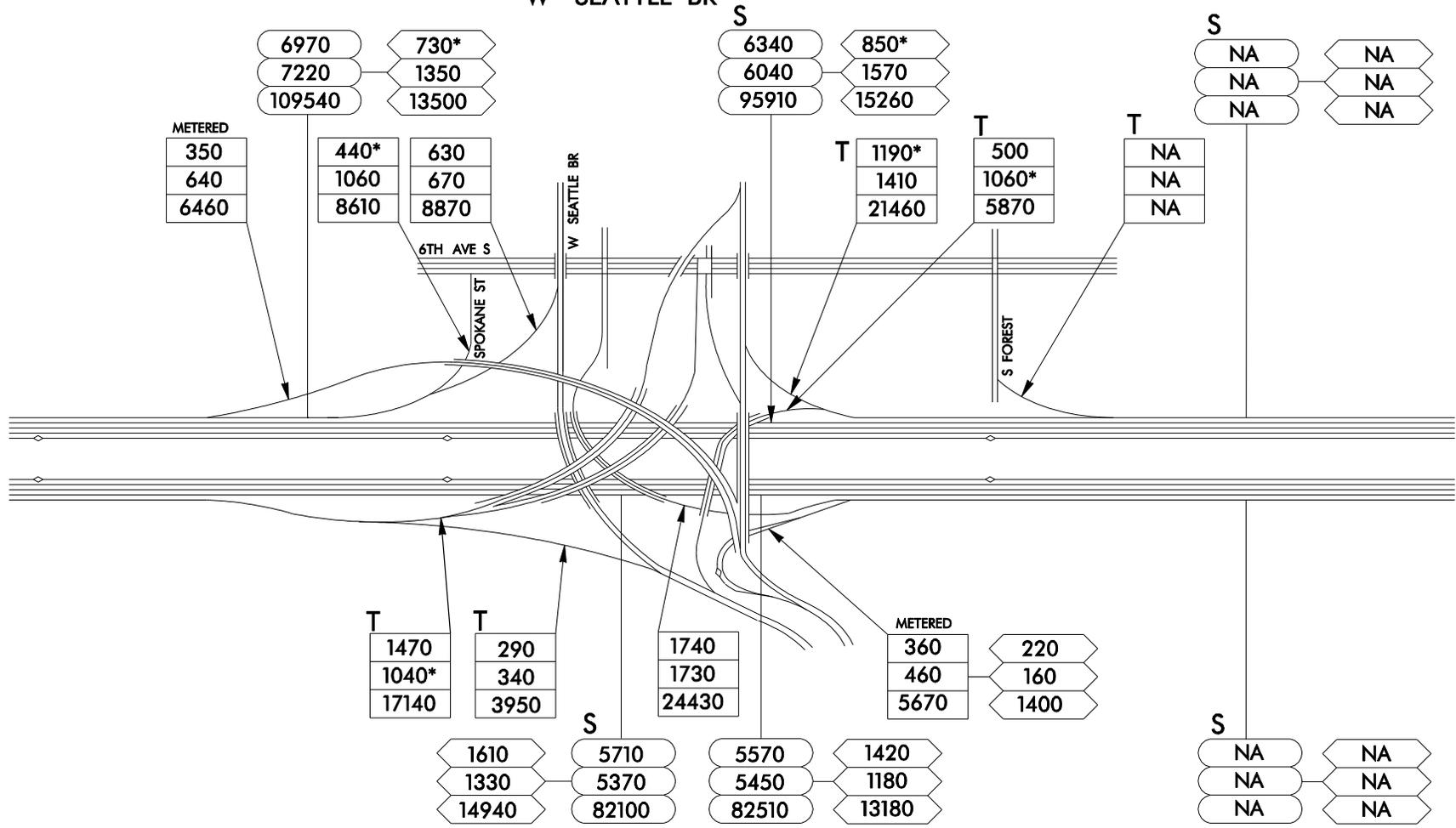
S OREGON ST



**EXIT 163\163A**  
 S SPOKANE ST  
 COLUMBIAN WY  
 W SEATTLE BR

**EXIT 163B**  
 S FOREST ST

S HOLGATE ST

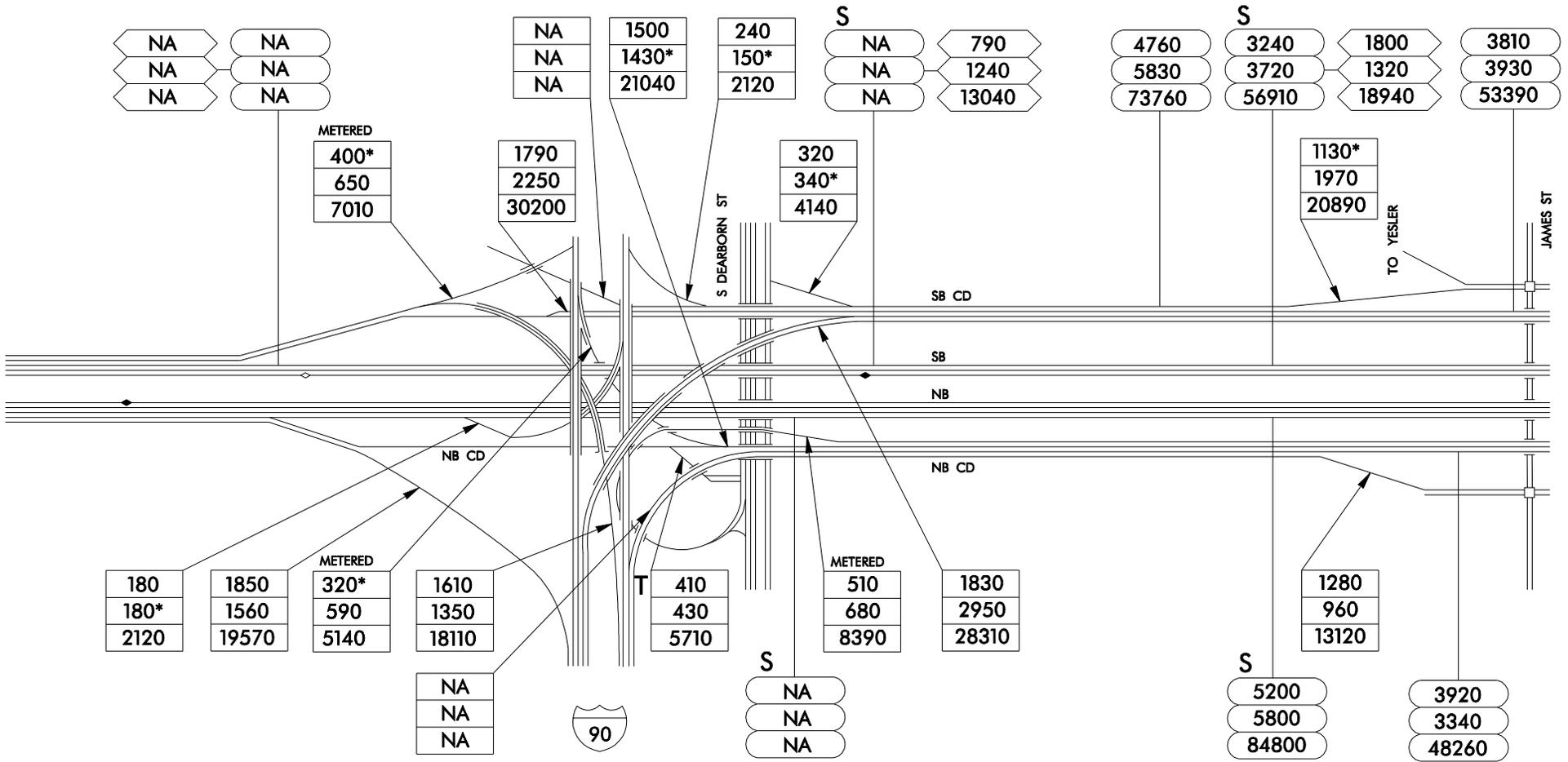


**EXIT 164A**  
COLLECTOR-DISTRIBUTOR

**EXIT 164B**  
4TH AVE S DEARBORN ST

YESLER WAY

JAMES ST



Washington State  
Department of Transportation

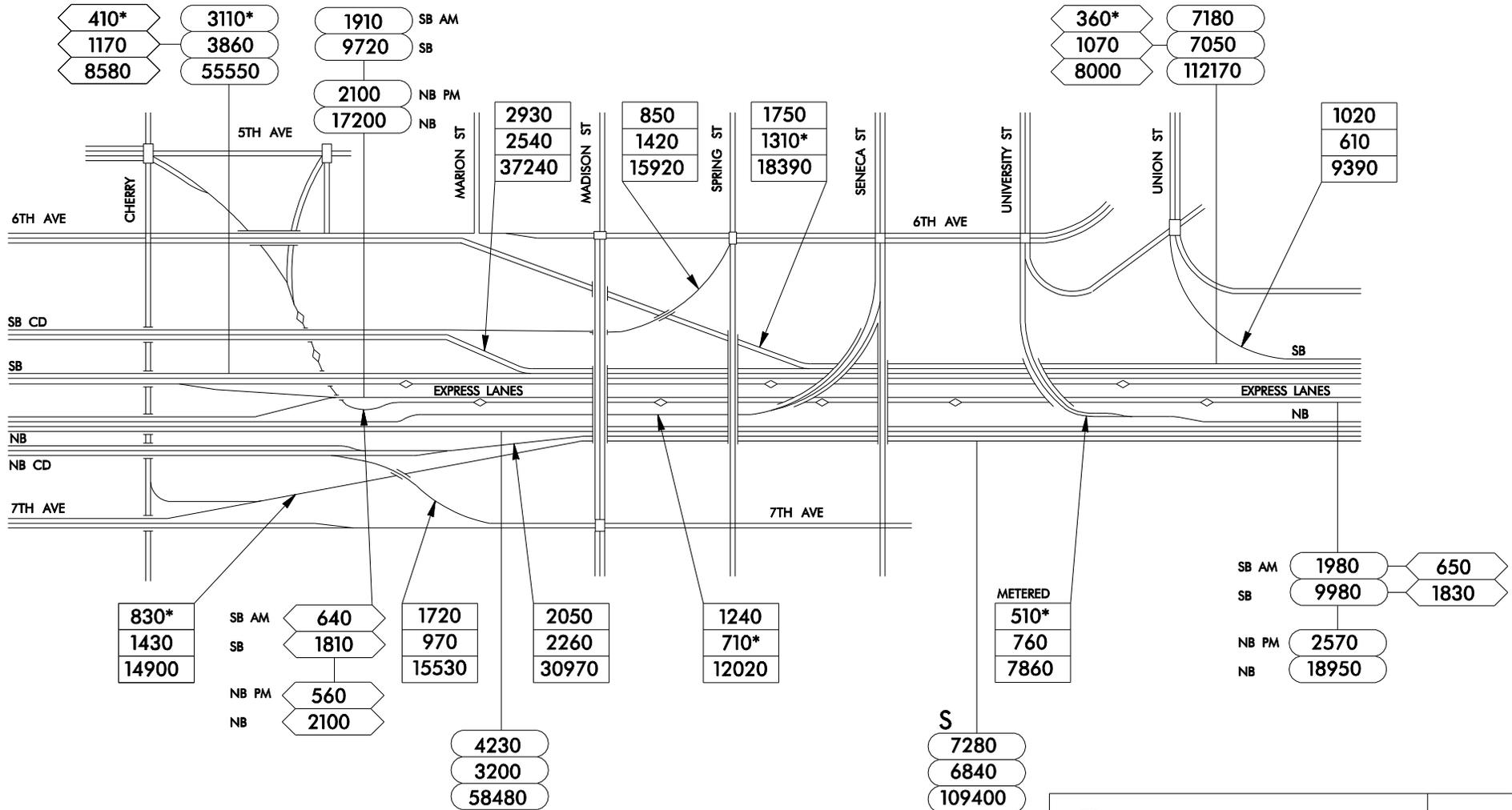


10  
OF  
25

CHERRY ST

MADISON ST

UNIVERSITY ST

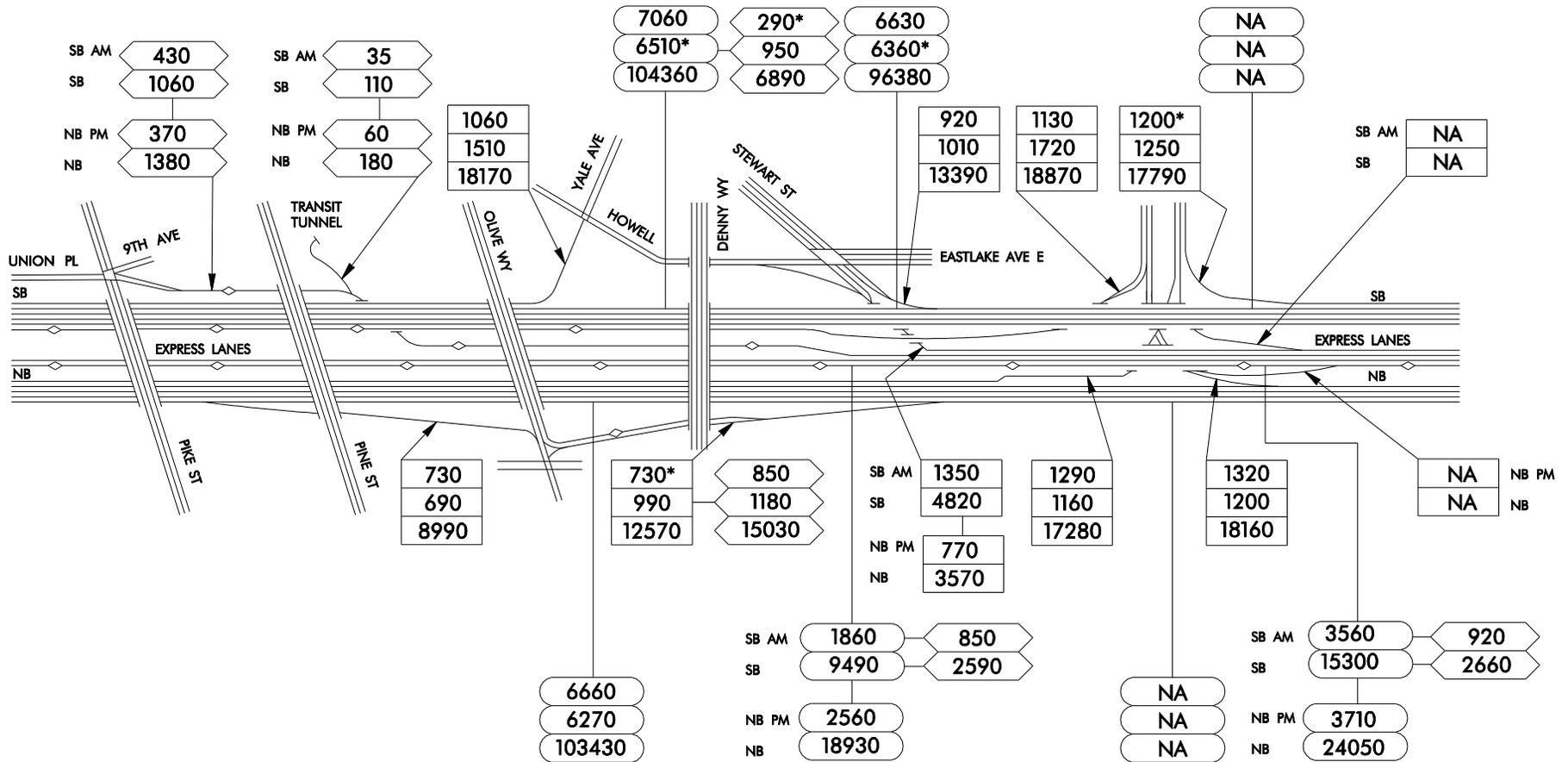


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EXIT 166  
DENNY WAY

EXIT 167  
MERCER ST



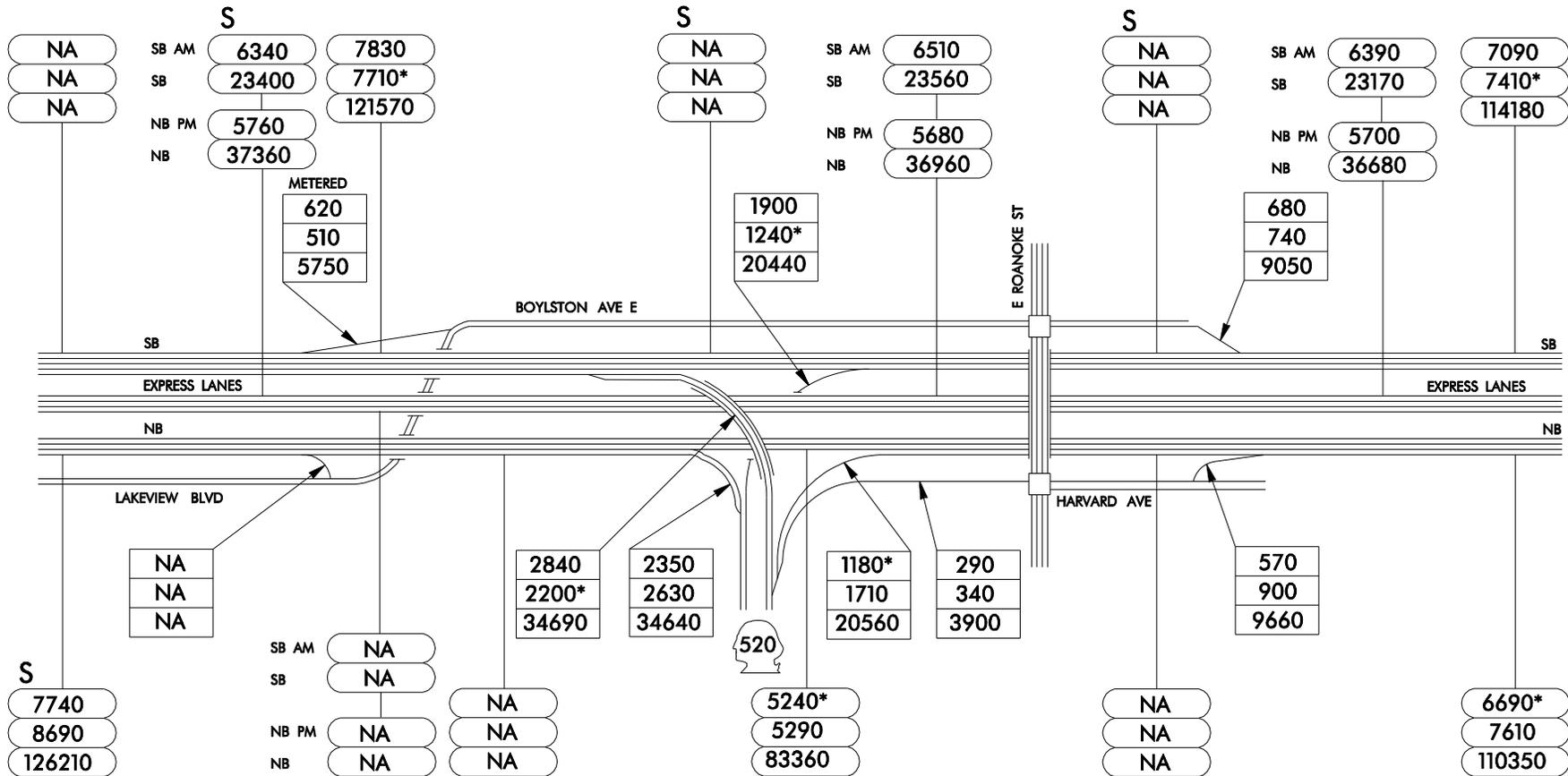
E GALER ST

EXIT 168A  
BOYLSTON AVE  
LAKEVIEW BLVD

EXIT 168B  
ROANOKE ST  
SR 520

EXIT 168A  
HARVARD AVE  
ROANOKE ST

SHIP CANAL  
BRIDGE

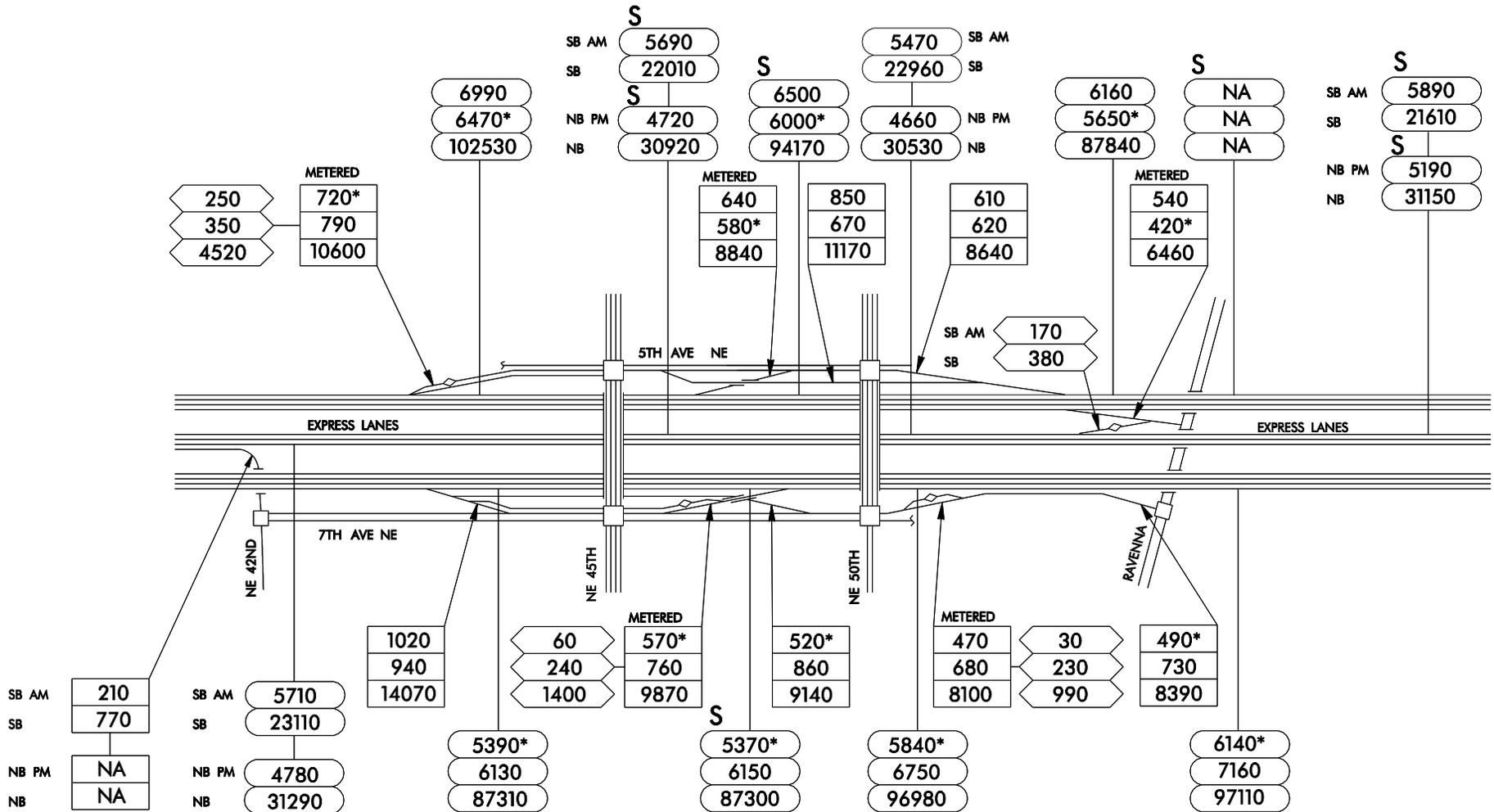


NE 42ND ST

EXIT 169

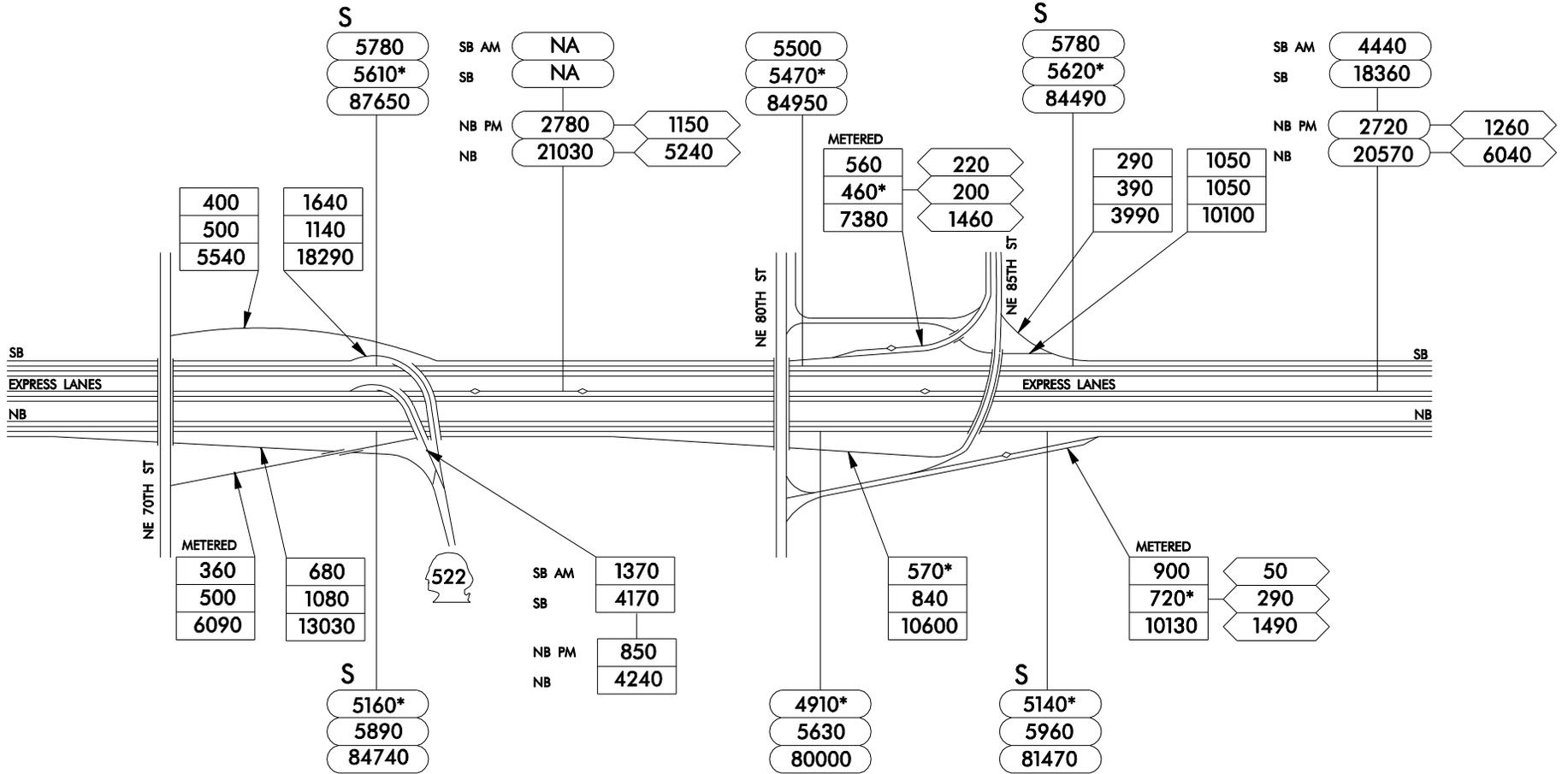
NE 45TH ST  
NE 50TH ST

RAVENNA BLVD



**EXIT 171**  
NE 70TH ST  
LAKE CITY WY

**EXIT 172**  
NE 80TH ST  
NE 85TH ST



NE 92ND ST



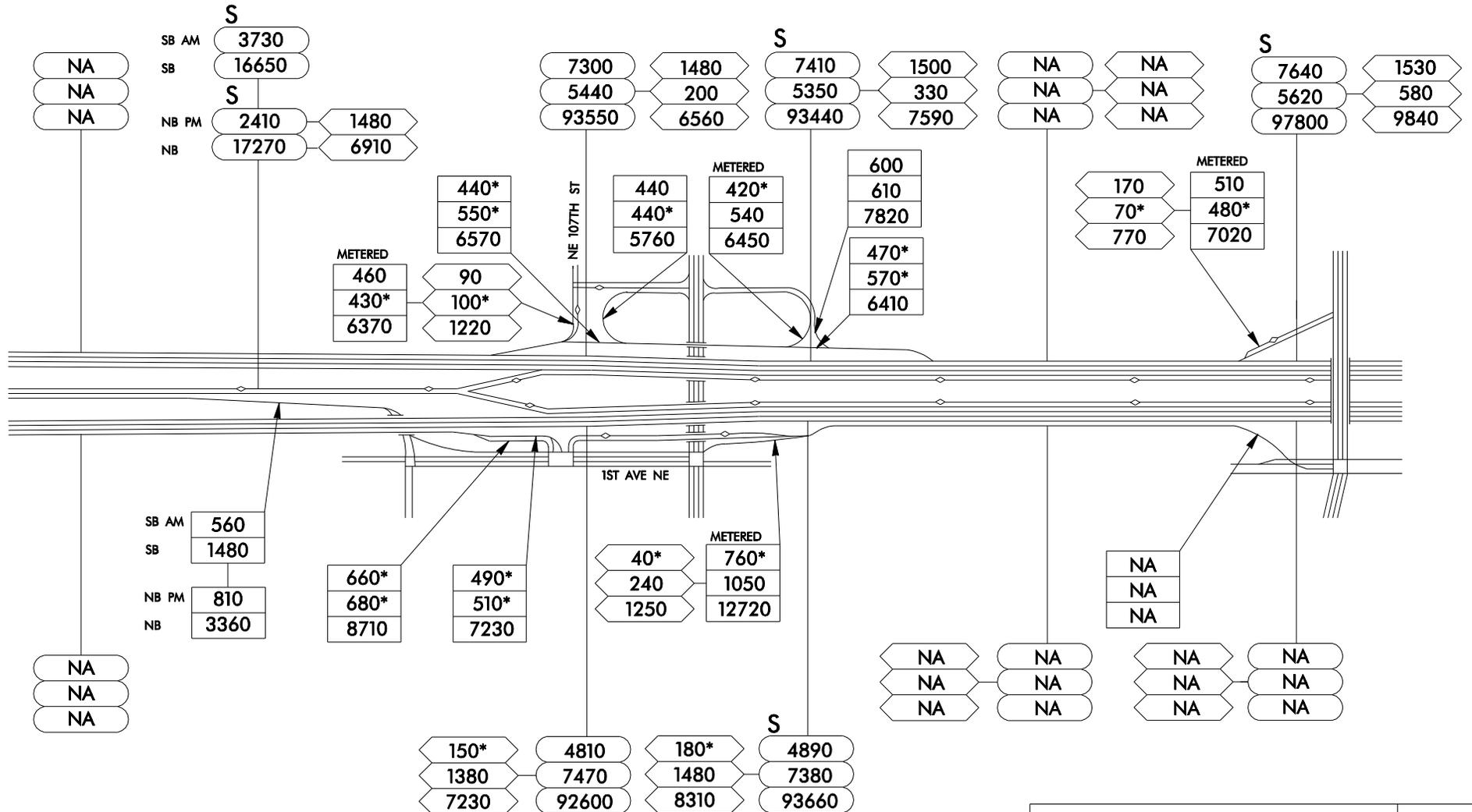
EXIT 173

NE NORTHGATE WY

EXIT 174

NE 120TH ST

NE 130TH ST



Washington State Department of Transportation



16 OF 25

NE 137TH ST      **EXIT 175**      SR 523      NE 145TH ST      NE 155TH ST      METRO NORTH BASE      **EXIT 176**      NE 175TH ST      NE 185TH ST

NA 1560  
NA 650  
NA 11060

S 6280 1720  
4780 750  
81880 12340

6420 1710  
5330 780  
89080 12580

S 6460 1760  
5390 790  
89860 12690

1660 5820 1730 6210  
790 4790 830 5570  
12420 79160 12630 89030

1840  
790  
13310

523

680 10  
860 10  
10960 100

METRO ONLY  
80\*  
50  
600

METRO ONLY  
60\*  
60  
560

METERED  
670  
540\*  
8600  
250  
90  
1560

500  
610  
7620

5TH AVE NE

710  
1100  
13020

10  
10  
20

METERED  
550 50\*  
650 240  
8330 1470

METRO ONLY  
50  
50  
490

METRO ONLY  
40  
40  
400

EXIT TO NE 175TH ONLY  
560\*  
1010  
10950

METERED  
460\*  
610  
7830

40\*  
220  
1250

S 4990 250\* 4300 270\*  
7590 1570 6590 1600  
96370 9360 83410 9710

4880 270\*  
7160 1610  
93050 9720

S 4940 270\*  
7130 1680  
93790 9980

300\* 4300 320\* 4870  
1720 5920 1390 6880  
10410 79830 7490 91950

EXIT 177

EXIT 178

EXIT 179

NE 195TH ST

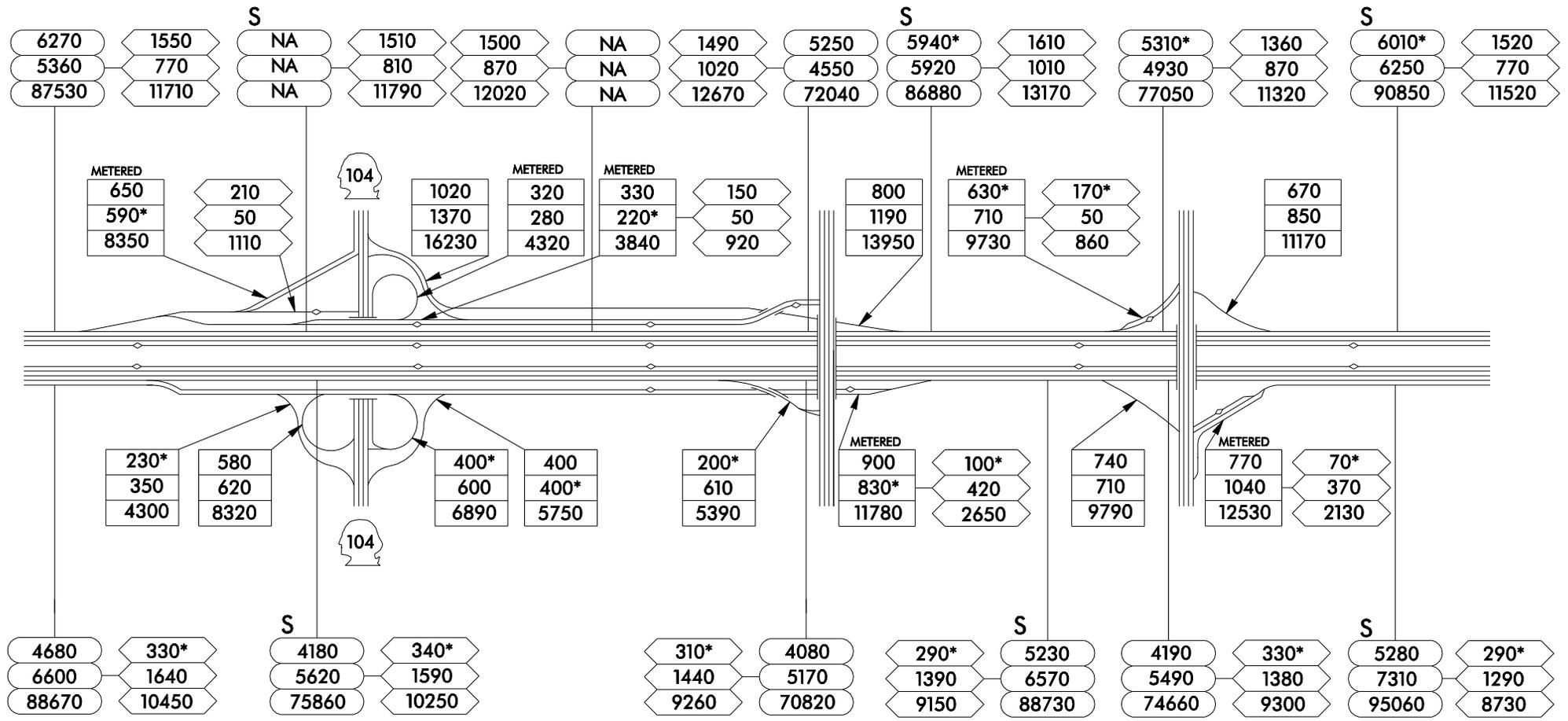
SR 104  
NE 205TH ST

236TH ST SW

228TH ST SW

220TH ST SW

213TH ST SW



## **APPENDIX B**

### **Local Traffic Count Data**

#	S.No	City	Freeway	Interchange Area	Major ST	Minor ST	Data source	Counts 1/2003 to 1/2005			Counts Prior to 1/2003			
								AM Count Date (Time)	PM Count Date (Time)	Other Count Date (Time)	AM Count Date (Time)	PM Count Date (Time)	Other Count Date (Time)	
1		Mountlake Terrace	I-5	220th ST SW	220th ST SW	I-5 SB Ramps	WSDOT Traffic		12/04 330-6			4/02 630-830		
2		Mountlake Terrace	I-5	220th ST SW	220th ST SW	I-5 NB Ramps	WSDOT Traffic					5/02 630-830	5/02 330-6	
3		Mountlake Terrace	I-5	220th ST SW	220th ST SW	66th Ave W								
4		Mountlake Terrace	I-5	220th ST SW	220th ST SW	56th Ave W								
5		Mountlake Terrace	I-5	236th ST SW	236th ST SW	I-5 SB On Ramp	WSDOT Traffic					10/01 330-6		
6		Mountlake Terrace	I-5	236th ST SW	236th ST SW	I-5 NB Off Ramp	WSDOT Traffic					10/01 330-6		
7		Mountlake Terrace	I-5	236th ST SW	236th ST SW	56th Ave W								
9		Mountlake Terrace/Shoreline	I-5	NE 205th ST/SR 104/lake Ballinger Way	SR 104/NE 205th ST	I-5 SB Ramps								
10		Mountlake Terrace/Shoreline	I-5	NE 205th ST/SR 104/lake Ballinger Way	SR 104/NE 205th ST	I-5 NB Ramps								
11		Mountlake Terrace/Shoreline	I-5	NE 205th ST/SR 104/lake Ballinger Way	SR 104/NE 205th ST	5th Ave NE								
12		Mountlake Terrace/Shoreline	I-5	NE 205th ST/SR 104/lake Ballinger Way	SR 104/NE 205th ST	15th Ave NE								
13		Mountlake Terrace/Shoreline	I-5	NE 205th ST/SR 104/lake Ballinger Way	244th St SW	19th Ave NE								
14		Shoreline	I-5	NE 175th Street	NE 175th ST	I-5 SB Ramps	WSDOT Traffic					1/00 630-830	1/00 330-6	1/00 1130-1
15		Shoreline	I-5	NE 175th Street	NE 175th ST	I-5 NB Ramps	WSDOT Traffic					1/00 630-830	1/00 330-6	1/00 1130-1
16		Shoreline	I-5	NE 175th Street	NE 175th ST	Meridian Ave N								
17		Shoreline	I-5	NE 175th Street	NE 175th ST	5th Ave NE								
18		Seattle/Shoreline	I-5	NE 145th Street	NE 145th ST	I-5 SB Ramps								
19		Seattle/Shoreline	I-5	NE 145th Street	5th Ave NE	I-5 NB Off Ramp at 5th Ave NE	I-5 Ops Study							
20		Seattle/Shoreline	I-5	NE 145th Street	NE 145th ST	1st Ave NE								
21		Seattle/Shoreline	I-5	NE 145th Street	5th Ave NE	I-5 NB On Ramp	WSDOT Traffic	6/04 330-6					8/02 130-2	
22		Seattle/Shoreline	I-5	NE 145th Street	NE 145th ST	5th Ave NE	WSDOT Traffic							
23		Seattle	I-5	NE 130th Street	NE 130th ST	I-5 SB On Ramp		5/4/2005 6:30-8:30	5/04 3:30-6:00	5/04 11:45-12:45				
24		Seattle	I-5	NE 130th Street	NE 130th ST	1st Ave NE		3/04 6:30-8:30	3/04 3:30-6:00	3/04 OFF PEAK				
25		Seattle	I-5	NE 130th Street	5th Ave NE	I-5 NB Off Ramp	I-5 Ops Study							
26		Seattle	I-5	NE 130th Street	5th Ave NE/NE Roosevelt Way	NE 130th ST	I-5 Ops Study							
27		Seattle	I-5	Northgate	N Northgate Way	I-5 SB Ramps								
28		Seattle	I-5	Northgate	N Northgate Way	Meridian Ave N								
29		Seattle	I-5	Northgate	N Northgate Way	1st Ave NE/I-5 NB On Ramp								
30		Seattle	I-5	Northgate	1st Ave NE	I-5 NB Ramps	WSDOT Traffic	8/04 330-6						
31		Seattle	I-5	Northgate	Corliss Ave N	107th ST/I-5 SB On Ramp	WSDOT Traffic					7/02 330-6		
32		Seattle	I-5	Northgate	1st Ave NE	I-5 EL Off Ramp								
33		Seattle	I-5	NE 80th/85th Street	NE 85th ST	I-5 SB Ramps								
34		Seattle	I-5	NE 80th/85th Street	NE 80th ST	I-5 SB Off Ramp								
35		Seattle	I-5	NE 80th/85th Street	NE 85th ST/Banner Way NE	I-5 NB Ramps								
36		Seattle	I-5	Lake City Way SR 522	NE 70th ST	I-5 SB Off Ramp								
38		Seattle	I-5	Lake City Way SR 522	NE 70th ST	I-5 NB On Ramp								
39		Seattle	I-5	NE 65th Street/Ravenna	NE Ravenna Blvd	I-5 NB Off Ramp	WSDOT Traffic							
40		Seattle	I-5	NE 65th Street/Ravenna	NE Ravenna Blvd	I-5 SB On Ramp/I-5 EL Ramp								
41		Seattle	I-5	NE 65th Street/Ravenna	NE Ravenna Blvd	NE 65th ST								
42		Seattle	I-5	NE 65th Street/Ravenna	Roosevelt Way NE	NE Ravenna Blvd								
43		Seattle	I-5	NE 50th Street	NE 50th ST	I-5 NB Ramps/7th AVE NE								
44		Seattle	I-5	NE 50th Street	NE 50th ST	I-5 SB Ramps/5th AVE NE								
45		Seattle	I-5	NE 50th Street	7th AVE NE	I-5 NB Off Ramp								
46		Seattle	I-5	NE 50th Street	7th AVE NE	I-5 NB On Ramp								
1	47	Seattle	I-5	NE 45th Street	NE 45th ST	I-5 NB Ramps/7th AVE NE	SR520 BR&HOV					1/98 7:45-8:45am	1/98 4:45-5:45pm	1/98 1-2pm
2	48	Seattle	I-5	NE 45th Street	NE 45th ST	I-5 SB Ramps/5th AVE NE	SR520 BR&HOV					1/99 8-9am	1/99 5-6pm	1/99 1-2pm
3	49	Seattle	I-5	NE 45th Street	I-5 NB Off-Ramp	7th AVE	SR520 BR&HOV	12/03 7-9am	12/03 4-6pm					
4	50	Seattle	I-5	NE 45th Street	7th AVE NE	I-5 NB On-Ramp		12/03 7-9am	12/03 4-6pm					
5	51	Seattle	I-5	NE 45th Street	I-5 SB On-Ramp	5th AVE NE	SR520 BR&HOV	12/03 7-9am	12/03 4-6pm					
6	52	Seattle	I-5	NE 45th Street	5th AVE NE	I-5 SB Off-Ramp								
73	53	Seattle	I-5	NE 45th Street	NE 45th ST	Latona AVE								
74	54	Seattle	I-5	NE 45th Street	NE 45th ST	Roosevelt AVE NE								
12	55	Seattle	I-5	Boylston On/Lakeview Off	Boylston AVE E	E Louisa ST	SR520 BR&HOV	11/03 7-10am	11/03 4-7pm					
13	56	Seattle	I-5	Boylston On/Lakeview Off	Boylston AVE E	E Lynn ST	SR520 BR&HOV	11/03 7-10am	11/03 4-7pm					
14	57	Seattle	I-5	Boylston On/Lakeview Off	Boylston AVE E	E Boston ST	SR520 BR&HOV	11/03 7-10am	11/03 4-7pm					
15	58	Seattle	I-5	Boylston On/Lakeview Off	Boylston AVE E/I-5 SB On-Ramp	E Newton ST	SR520 BR&HOV	11/03 7-10am	11/03 4-7pm					
16	59	Seattle	I-5	Boylston On/Lakeview Off	Lakeview BLVD E	Harvard AVE E	SR520 BR&HOV	11/03 7-10am	11/03 4-7pm					
17	60	Seattle	I-5	Boylston On/Lakeview Off	Lakeview BLVD E	I-5 NB Off-Ramp/E Garfield ST	SR520 BR&HOV	11/03 7-10am	11/03 4-7pm					
89	62	Seattle	I-5	Boylston On/Lakeview Off	Eastlake AVE E	E Boston ST or E Newton ST						4/01 7:45-8:45am	4/01 5-6pm	4/01 1-2pm
8	63	Seattle	I-5 & SR 520	Boylston/Harvard/Roanoke	Harvard AVE E	I-5 NB On-Ramp/E Hamlin ST	SR520 BR&HOV	11/03 7-10am	11/03 4-7pm					
9	64	Seattle	I-5 & SR 520	Boylston/Harvard/Roanoke	Harvard AVE E	E Edgar ST	SR520 BR&HOV	11/03 7-10am	11/03 4-7pm					
10	65	Seattle	I-5 & SR 520	Boylston/Harvard/Roanoke	I-5 SB Off-Ramp	Boylston AVE E/E Edgar ST	SR520 BR&HOV	11/03 7-10am	11/03 4-7pm					
11	66	Seattle	I-5 & SR 520	Boylston/Harvard/Roanoke	E Roanoke ST	Broadway E	SR520 BR&HOV	12/03 7-10am	12/03 4-7pm					
75	67	Seattle	I-5 & SR 520	Boylston/Harvard/Roanoke	Eastlake AVE NE	E Roanoke ST	Either Trans-Lake or SR520 BR&HOV					6/01 6:30-9:30am	6/01 4-7pm	
140	68	Seattle	I-5 & SR 520	Boylston/Harvard/Roanoke	E Roanoke ST	Harvard AVE E/SR520 WB Off-Ramp	SR520 BR&HOV					8/00 8-9am	8/00 5-6pm	8/00 1-2pm
141	69	Seattle	I-5 & SR 520	Boylston/Harvard/Roanoke	10th AVE E	E Roanoke ST	SR520 BR&HOV					8/00 7:45-8:45am	8/00 5-6pm	8/00 1-2pm
142	70	Seattle	I-5 & SR 520	Boylston/Harvard/Roanoke	Boylston AVE E	E Roanoke ST	SR520 BR&HOV					8/00 8-9am	8/00 5-6pm	8/00 1-2pm
18	71	Seattle	I-5	Mercer	Valley ST	Westlake AVE E	Either Trans-Lake or SR520 BR&HOV					7/01 6:30-9:30am	7/01 4-7pm	7/01 1-2pm
19	72	Seattle	I-5	Mercer	Mercer ST	Westlake AVE E	Either Trans-Lake or SR520 BR&HOV					7/01 6:30-9:30am	7/01 4-7pm	
20	73	Seattle	I-5	Mercer	Valley ST	9th AVE N	Either Trans-Lake or SR520 BR&HOV	12/03 7-10am						
21	74	Seattle	I-5	Mercer	Mercer ST	9th AVE N	Either Trans-Lake or SR520 BR&HOV					7/00 7:30-8:30am	7/00 5-6pm	7/00 1-2pm
22	75	Seattle	I-5	Mercer	Fairview AVE N	Republican ST	SR520 BR&HOV					4/99 7:45-8:45am	4/99 4-5pm	4/99 1-2pm

143	76	Seattle	I-5	Mercer	Mercer ST	Fairview AVE N/I-5 Ramps	SR520 BR&HOV					11/00 6:30-9:30am	11/00 4-7pm
144	77	Seattle	I-5	Mercer	Fairview AVE N	Valley ST	SR520 BR&HOV					11/00 6:30-9:30am	11/00 4-7pm
145	78	Seattle	I-5	Mercer	Fairview AVE N	Eastlake AVE E	SR520 BR&HOV					11/00 6:30-9:30am	11/00 4-7pm
25	79	Seattle	I-5	Olive	E Olive Way	I-5 NB Ramps	SR520 BR&HOV	12/03 7-9am	12/03 4-6pm				
79	80	Seattle	I-5	Olive	E Olive Way	E Melrose AVE	SR520 BR&HOV	12/03 7-9am	12/03 4-6pm				
80	81	Seattle	I-5	Olive	E Olive Way	Boren AVE E							
95	82	Seattle	I-5	Olive	E Olive Way	Bellevue AVE E							
27	83	Seattle	I-5 EL	Pike/Convention Center	Pike ST	I-5 Express Lane Ramps/9th Ave/Union PL	SR520 BR&HOV	12/03 7-9am	12/03 4-6pm				
81	86	Seattle	I-5 EL	Pine	Pine ST	9th AVE							
52	87	Seattle	I-5	S Forest/6th Avenue S	6th AVE S	S Forest ST/I-5 SB Off-Ramp							
53	88	Seattle	I-5	S Spokane Street	6th AVE	I-5 NB Off-Ramp/Spokane ST							
54	89	Seattle	I-5	S Spokane Street	6th AVE	I-5 NB On-Ramp/Spokane ST							
55	90	Seattle	I-5	S Spokane Street	6th AVE	I-5 SB On-Ramp							
30	91	Seattle	I-5	Seneca	6th Ave	Seneca ST/I-5 NB Off-Ramp	SR520 BR&HOV	12/03 7-9am	12/03 4-6pm				
31	92	Seattle	I-5	Spring	6th Ave	Spring ST/I-5 SB On-Ramp	SR520 BR&HOV	12/03 7-9am	12/03 4-6pm				
			I-5	Spring	6th Ave	Madison ST							
23	93	Seattle	I-5 & I-5 EL	Stewart, Yale, Howell (EL)	Stewart ST	Yale AVE	SR520 BR&HOV	12/03 7-9am	12/03 4-6pm				
24	94	Seattle	I-5 & I-5 EL	Stewart, Yale, Howell (EL)	Stewart ST	Yale AVE/I-5 SB On-Ramp	SR520 BR&HOV					4/98 7:15-8:15am	4/98 5-6am 4/98 1-2am
76	95	Seattle	I-5 & I-5 EL	Stewart, Yale, Howell (EL)	Denny Way	Fairview AVE N							
77	96	Seattle	I-5 & I-5 EL	Stewart, Yale, Howell (EL)	Stewart ST	Boren Ave							
78	97	Seattle	I-5 & I-5 EL	Stewart, Yale, Howell (EL)	Boren Ave	Howell ST							
90	98	Seattle	I-5 & I-5 EL	Stewart, Yale, Howell (EL)	Stewart ST	Terry	SR520 BR&HOV					5/98 8-9am	
91	99	Seattle	I-5 & I-5 EL	Stewart, Yale, Howell (EL)	Stewart ST	9th AVE							
100	100	Seattle	I-5 & I-5 EL	Stewart, Yale, Howell (EL)	Stewart ST	8th AVE							
93	101	Seattle	I-5 & I-5 EL	Stewart, Yale, Howell (EL)	Stewart ST	7th AVE							
94	102	Seattle	I-5 & I-5 EL	Stewart, Yale, Howell (EL)	Stewart ST	6th AVE							
146	103	Seattle	I-5 & I-5 EL	Stewart, Yale, Howell (EL)	Stewart ST	Eastlake AVE E	SR520 BR&HOV					5/02 7-10am	5/02 4-7pm
147	104	Seattle	I-5 & I-5 EL	Stewart, Yale, Howell (EL)	Stewart ST	Denny Way	SR520 BR&HOV					4/98 7:45-8:45am	4/98 4:45-5:45am 4/98 1-2pm
41	105	Seattle	I-5	7th AVE/Hubbell PL CD	7th AVE	Columbia ST	SR520 BR&HOV	12/03 7-9am	12/03 4-6pm				
42	106	Seattle	I-5	7th AVE/Hubbell PL CD	7th AVE	Marion ST	SR520 BR&HOV	12/03 7-9am	12/03 4-6pm				
43	107	Seattle	I-5	7th AVE/Hubbell PL CD	7th AVE	Spring ST	SR520 BR&HOV	12/03 7-9am	12/03 4-6pm				
44	108	Seattle	I-5	7th AVE/Hubbell PL CD	7th AVE/Hubbell PL	Seneca ST	SR520 BR&HOV	12/03 7-9am	12/03 4-6pm				
46	110	Seattle	I-5	7th AVE/Hubbell PL CD	7th AVE/Hubbell PL	9th AVE	SR520 BR&HOV	12/03 7-9am	12/03 4-6pm				
47	111	Seattle	I-5	7th AVE/Hubbell PL CD	Pike ST	Hubbell PL/Terry AVE	SR520 BR&HOV	??					
51	112	Seattle	I-5	Airport Way S	Airport Way S	I-5 SB Off-ramp	SR520 BR&HOV	12/03 7-9am	12/03 4-6pm				
34	113	Seattle	I-5 EL	Cherry EL	Cherry ST	5th AVE/I-5 Ramp	SR520 BR&HOV					1/00 8-9am	1/00 4:45-5:45pm 1/00 1-2pm
48	114	Seattle	I-90 & I-5	Dearborn/I-90	4th AVE S	I-90/I-5 Ramps	SR520 BR&HOV					12/00 7:45-8:45am	12/00 5-6pm 12/00 1-2pm
49	115	Seattle	I-5	Dearborn/I-90	S Dearborn ST	I-5 SB Off-ramp/9th AVE S	SR520 BR&HOV	12/03 7-9am	12/03 4-6pm				
50	116	Seattle	I-5	Dearborn/I-90	S Dearborn ST	I-5 NB Ramps	SR520 BR&HOV	12/03 7-9am	12/03 4-6pm				
85	117	Seattle	I-90 & I-5	Dearborn/I-90	4th AVE S	S Royal Brougham Way							
86	118	Seattle	I-5	Dearborn/I-90	S Dearborn ST/Airport Way S	4th AVE S							
97	119	Seattle	I-5	Dearborn/I-90	S Dearborn ST	8th AVE S							
98	120	Seattle	I-5	Dearborn/I-90	S Dearborn ST	Corwin Place S							
7	121	Seattle	I-5 EL	I-5 Express/NE 42nd Street	7th AVE NE	I-5 Express Ramp/NE 42nd ST	SR520 BR&HOV	12/03 7-9am	12/03 4-6pm				
35	122	Seattle	I-5	James/Cherry	6th AVE/I-5 SB Off-Ramp	Columbia	SR520 BR&HOV	12/03 7-9am	12/03 4-6pm				
36	123	Seattle	I-5	James/Cherry	6th AVE/I-5 SB Off-Ramp	Cherry	SR520 BR&HOV					1/01 7-9am	1/01 4:45-5:45pm
37	124	Seattle	I-5	James/Cherry	Cherry ST	I-5 NB On-Ramp	SR520 BR&HOV	12/03 7-9am	12/03 4-6pm				
38	125	Seattle	I-5	James/Cherry	Cherry ST	7th AVE	SR520 BR&HOV	12/03 7-9am	12/03 4-6pm				
39	126	Seattle	I-5	James/Cherry	James ST	6th AVE	SR520 BR&HOV	??					
40	127	Seattle	I-5	James/Cherry	James ST	I-5 NB Ramps/7th AVE NE	SR520 BR&HOV	12/03 7-9am	12/03 4-6pm				
96	128	Seattle	I-5	James/Cherry	James ST	8th AVE							
32	129	Seattle	I-5 EL	Madison	Madison ST	I-5 NB Off-Ramp/7th AVE	SR520 BR&HOV					11/98 7:30-8:30am	11/98 4:45-5:45pm 11/98 1-2pm
28	130	Seattle	I-5	Union	Union ST/I-5 SB Ramp	7th AVE	SR520 BR&HOV	??					
83	131	Seattle	I-5	Union	Union ST	6th AVE							
29	132	Seattle	I-5	University	6th Ave	University Ave/I-5 Ramps	SR520 BR&HOV	??					
84	133	Seattle	I-5	University	University ST	5th AVE							
33	134	Seattle	I-5 EL	Columbia EL	Columbia ST	5th AVE/I-5 Ramp	SR520 BR&HOV	12/03 7-9am	12/03 4-6pm				
56	135	Seattle	I-5	Columbian Way	Columbian Way	S Spokane ST	SR520 BR&HOV	12/03 7-9am	12/03 4-6pm				
99	136	Seattle	I-5	Columbian Way	Columbian Way	15th AVE S							
138	138	Seattle	I-5	Corson/Michigan	S Michigan ST	Corson AVE S							
139	139	Seattle	I-5	Corson/Michigan	Airport Way S	Corson AVE S	SR520 BR&HOV	12/03 7-9am	12/03 4-6pm				
140	140	Seattle	I-5	Corson/Michigan	S Albro Pl	I-5 SB Off Ramp							
141	141	Seattle	I-5	Corson/Michigan	Airport Way S	S Albro Pl							
142	142	Seattle	I-5	Swift Ave S	Swift Ave S	I-5 NB On Ramp							
143	143	Seattle	I-5	Swift Ave S	Swift Ave S	I-5 NB Off Ramp							
144	144	Seattle	I-5	Swift Ave S	Swift Ave S	S Albro Pl							
145	145	Tukwila	I-5	Boeing Access Rd	Boeing Access Rd	I-5 SB Off Ramp							
146	146	Tukwila	I-5	Boeing Access Rd	Boeing Access Rd	I-5 NB Ramps							
147	147	Tukwila	I-5	Boeing Access Rd	Martin Luther King Jr. Way	Boeing Access Rd							
148	148	Tukwila	I-5	Boeing Access Rd	Boeing Access Rd	Airport Way S							
149	149	Tukwila	I-5	Boeing Access Rd	Marginal Way S	Boeing Access Rd							
150	150	Tukwila	I-5	Martin Luther King Jr Way	Martin Luther King Jr Way	I-5 NB On Ramp							
151	151	Tukwila	I-5	Martin Luther King Jr Way	Martin Luther King Jr Way	I-5 NB Off Ramp							
152	152	Tukwila	I-5	Martin Luther King Jr Way	Martin Luther King Jr Way	I-5 SB Off Ramp							
153	153	Tukwila	I-5	Martin Luther King Jr Way	Martin Luther King Jr Way	I-5 SB On Ramp							
154	154	Tukwila	I-5	Interurban Ave S	Interurban Ave S	I-5 SB Off Ramp							
155	155	Tukwila	I-5	Interurban Ave S	Interurban Ave S	I-5 NB On Ramp							

**APPENDIX C**  
**Current Transit Service**

Transit Service on I-5 Study Corridor (effective Sept/04-Feb/05)											
Routes Serving Corridor	Major Areas Served	Operations on I-5	I-5 Access Locations (within Study Area)			Hours of Operations				Service Period	Headway (Minutes) in Peaks
			Outside Downtown Seattle	Downtown Seattle	Park-and-Ride Access	Peak	Midday	Early Evening	Late Evening		
<b>KC Metro</b>											
41	Lake City; downtown Seattle	Between Northgate and downtown Seattle	NE Northgate Way	Stewart/Olive	Yes (Northgate)	X	X	X	X	To Downtown Seattle: Between 5:00 AM & 12:30 AM From Downtown: Between 6:00 AM & 1:45 AM	To Downtown Seattle: 14 & From Downtown Seattle: 5
64	Lake City; U-District; downtown Seattle	Between Lake City and Downtown Seattle	NE 65th Street; Freeway Station at I-5/NE45th St.	9th Avenue	Yes (NE 65th St)	X				To Downtown Seattle: Between 5:45 AM & 8:30 AM From Downtown: Between 3:30 PM & 6:30 PM	26
71	North Seattle (View Ridge); downtown Seattle	Between downtown Seattle and U-District (Northbound only)	NE 45th Street	Olive Street	No	X	X			To Downtown Seattle: Between 5:00 AM & 11:00 AM From Downtown: Between 12:15 PM & 7:00 PM	To Downtown Seattle: 30 & From Downtown Seattle: 30
72	Lake City; U-District; downtown Seattle	Between downtown Seattle and U-District	NE 42nd Street	DSTT (Convention Place Station)	No	X	X			To Downtown Seattle: Between 5:00 AM & 11:00 AM From Downtown: Between 12:15 PM & 7:00 PM	To Downtown Seattle: 30 & From Downtown Seattle: 30
73	Jackson Park; U-District; downtown Seattle	Between downtown Seattle and North Seattle	NE 42nd Street	DSTT (Convention Place Station)	Yes (NE 65th St)	X	X			To Downtown Seattle: Between 5:00 AM & 11:00 AM From Downtown: Between 12:15 PM & 7:00 PM	To Downtown Seattle: 16 & From Downtown Seattle: 13
74 (Express)	Seattle (Sand Point) and downtown Seattle	Between U-District and downtown Seattle	NE 45th Street	James Street	No	X				To Downtown Seattle: Between 5:00 AM & 9:00 AM From Downtown: Between 3:30 PM & 7:00 PM	36
76	North Seattle; downtown Seattle	Between NE 65th and downtown Seattle	NE 65th Street	James Street	Yes (NE 65th St)	X				To Downtown Seattle: Between 6:00 AM & 9:00 AM From Downtown: Between 3:30 PM & 6:45 PM	23
77	North Seattle; downtown Seattle	Between Lake City and Downtown Seattle	Lake City Way NE	James Street	No	X				To Downtown Seattle: Between 6:00 AM & 9:00 AM From Downtown: Between 3:30 PM & 7:00 PM	23
79	Lake City; downtown Seattle	Between Lake City and Downtown Seattle	NE 45th Street	James Street	No	X				To Downtown Seattle: Between 6:15 AM & 9:00 AM From Downtown: Between 4:00 PM & 7:00 PM	45
101	Federal Way; downtown Seattle	Between South Seattle and downtown Seattle	MLK S.	S. Spokane	No	X	X	X	X	To Downtown Seattle: Between 5:00 AM & 9:30 PM From Downtown: Between 5:30 AM & 10:30 PM	To Downtown Seattle: 23 & From Downtown Seattle: 9
106	Federal Way; downtown Seattle	Between South Seattle and downtown Seattle	S. Graham	S. Spokane	No	X	X	X	X	To Downtown Seattle: Between 5:00 AM & 12:30 AM From Downtown: Between 5:30 AM & 1:30 AM	To Downtown Seattle: 36 & From Downtown Seattle: 23
133	White Center; U-District	Between South Seattle and U-District	NE 45th Street	S. Michigan Street	No	X				To U-District: Between 6:30 AM & 8:15 AM From U-District: Between 3:30 PM & 6:30 PM	45
143	Black Diamond; Maple Valley; Renton; downtown Seattle	Between SE Seattle and downtown Seattle	MLK S.	Seneca Street and S. Atlantic Street	No	X	X			To Downtown Seattle: Between 5:30 AM & 7:15 PM From Downtown Seattle: Between 5:00 PM & 6:00 PM	To Downtown Seattle: 90 & From Downtown Seattle: 36
150	Auburn; Kent; Tukwila; downtown Seattle	Between Tukwila and downtown Seattle	Interurban Avenue S.	S. Spokane Street	No	X	X	X	X	To Downtown Seattle: Between 5:30 AM & 1:00 AM From Downtown: Between 5:00 AM & 2:30 AM	To Downtown Seattle: 15 & From Downtown Seattle: 15
152	Enumclaw; Auburn; Federal Way; downtown Seattle	Between Federal Way and downtown Seattle	No Access	S. Spokane Street	No	X		X (To Downtown only)		To Downtown Seattle: Between 5:15 AM & 8:15 AM & 5:15 PM - 7:30 PM From Downtown: Between 3:30 PM & 7:00 PM	23
158	Kent; downtown Seattle	Between Kent and downtown Seattle	No Access	Seneca Street and S. Atlantic Street	No	X				To Downtown Seattle: Between 5:00 AM & 7:30 AM From Downtown: Between 3:30 PM & 7:00 PM	36
159	Kent; downtown Seattle	Between Kent and downtown Seattle	No Access	Seneca Street and S. Atlantic Street	No	X				To Downtown Seattle: Between 5:00 AM & 7:30 AM From Downtown: Between 3:45 PM & 6:30 PM	36
160/163	Tukwila; downtown Seattle	Between Tukwila and downtown Seattle	Interurban Avenue S.			X				To Downtown Seattle: Between 5:45 AM & 8:30 AM From Downtown: Between 4:00 PM & 6:30 PM	30
162	Kent; downtown Seattle	Between Kent and downtown Seattle	No Access	Seneca Street and S. Atlantic Street	No	X				To Downtown Seattle: Between 5:00 AM & 7:30 AM From Downtown: Between 4:30 PM & 7:00 PM	90 (only two trips)
175	Federal Way; downtown Seattle	Between Federal Way and downtown Seattle	No Access	Seneca Street	No	X				To Downtown Seattle: Between 5:30 AM & 8:15 AM From Downtown: Between 3:00 PM & 7:00 PM	36
190	Federal Way; SeaTac; downtown Seattle	Between Federal Way and downtown Seattle	No Access	S. Spokane Street	No	X				To Downtown Seattle: Between 6:15 AM & 8:30 AM From Downtown: Between 3:30 AM & 6:00 PM	30
191	Federal Way; SeaTac; downtown Seattle	Between Tukwila and downtown Seattle	No Access	S. Spokane Street	No	X				To Downtown Seattle: Between 5:45 AM & 9:00 AM From Downtown: Between 3:30 PM & 7:00 PM	36
192	Federal Way; Kent; downtown Seattle	Between Federal Way and downtown Seattle	No Access	Seneca Street and S. Spokane Road	No	X				To Downtown Seattle: Between 6:00 AM & 8:30 AM From Downtown: Between 3:30 PM & 6:30 PM	36
194	Federal Way; SeaTac; downtown Seattle	Between Federal Way and downtown Seattle	No Access	S. Spokane Street	No	X	X	X	X	To Downtown Seattle: Between 5:45 AM & 9:45 PM From Downtown: Between 4:30 AM & 11:00 PM	To Downtown Seattle: 18 & From Downtown Seattle: 30

Routes Serving Corridor	Major Areas Served	Operations on I-5	I-5 Access Locations (within Study Area)			Hours of Operations				Service Period	Headway (Minutes) in Peaks
			Outside Downtown Seattle	Downtown Seattle	Park-and-Ride Access	Peak	Midday	Early Evening	Late Evening		
196	Federal Way; downtown Seattle	Between Federal Way and downtown Seattle	No Access	S. Spokane Street		X				To Downtown Seattle: Between 5:30 AM & 9:00 AM From Downtown: Between 3:30 PM & 7:00 PM	23
197	Federal Way; U-District	Between Federal Way and U-District	NE 45th Street	No Access	No	X				To U-District: Between 5:30 AM & 8:45 AM From U-District: Between 12:30 PM & 7:30 PM	30
205	Mercer Island U-District	Between downtown Seattle and U-District	NE 45th Street	Stewart Street	No	X				To U-District: Between 6:45 AM & 9:15 AM From U-District: Between 1:30 PM & 6:15 PM	90 ( only two trips)
242	Bellevue (Overlake) and Seattle (Northgate)	Between SR 520 and Northgate	SR 520; NE 65th Street	No Access	Yes (NE 65th St)	X				To Overlake: Between 6:00 AM & 9:45 AM From Overlake: Between 3:30 PM & 8:00 PM	36
250	Redmond; downtown Seattle	Between SR 520 and downtown Seattle	SR 520	Stewart/Olive	No	X				To Downtown Seattle: Between 5:30 AM & 8:45 AM From Downtown: Between 3:30 PM & 7:30 PM	36
252	Kirkland, downtown Seattle	Between SR 520 and downtown Seattle	SR 520	Stewart/Olive	No	X				To Downtown Seattle: Between 5:45 AM & 8:00 PM From Downtown: Between 3:00 AM & 6:45 PM	26
255	Kirkland, U-District; downtown Seattle	Between SR 520 and downtown Seattle	SR 520	DSTT (Convention Place Station)	No	X	X	X	X	To Downtown Seattle: Between 5:00 AM & 10:45 PM From Downtown: Between 5:30 AM & 1:00 AM	To Downtown Seattle: 30 & From Downtown Seattle: 15
256	Kirkland, downtown Seattle	Between SR 520 and downtown Seattle	SR 520	DSTT (Convention Place Station)	No	X				To Downtown Seattle: Between 3:30 PM & 5:45 PM From Downtown: Between 5:45 AM & 8:15 AM	36
257	Kirkland, downtown Seattle	Between SR 520 and downtown Seattle	SR 520	Stewart/Olive	No	X				To Downtown Seattle: Between 5:15 AM & 8:00 PM From Downtown: Between 3:30 AM & 7:00 PM	36
260	Kirkland, downtown Seattle	Between SR 520 and downtown Seattle	SR 520	Stewart/Olive	No	X				To Downtown Seattle: Between 6:15 AM & 8:30 PM From Downtown: Between 4:00 AM & 6:30 PM	60 (only 3 trips)
261	Redmond; Bellevue, U-District; downtown Seattle	Between SR 520 and downtown Seattle	SR 520	Stewart/Olive	No	X				To Downtown Seattle: Between 5:30 AM & 9:00 AM From Downtown: Between 3:30 PM & 6:45 PM	30
266	Redmond; downtown Seattle	Between SR 520 and downtown Seattle	SR 520	DSTT (Convention Place Station)	No	X				To Downtown Seattle: Between 5:30 AM & 9:00 AM From Downtown: Between 3:30 PM & 7:00 PM	30
268	Redmond; downtown Seattle	Between SR 520 and downtown Seattle	SR 520	Stewart/Olive	No	X				To Downtown Seattle: Between 6:00 AM & 8:30 AM From Downtown: Between 3:30 PM & 6:30 PM	36
280	Tukwila; Renton; Bellevue; U-District; downtown Seattle	Between Tukwila and downtown Seattle	No Access	No Access					X (all night route)	Between 2:00 AM & 4:30 AM	NA
301	Richmond Beach; downtown Seattle	Between Shoreline and downtown Seattle	No Access	DSTT (Convention Place Station)	No	X	X	X		To Downtown Seattle: Between 4:45 AM & 7:00 PM From Downtown: Between 5:30 AM & 7:00 PM	To Downtown Seattle: 60 & From Downtown Seattle: 15
303	Shoreline; Seattle (First Hill)	Between Shoreline and downtown Seattle	No Access	Seneca Street	No	X				To First Hill: Between 5:30 AM & 9:00 AM From First Hill: Between 3:30 PM & 7:00 PM	30
304	Richmond Beach; downtown Seattle	Between Green Lake and downtown Seattle	No Access	James Street	No	X				To Downtown Seattle: Between 6:15 AM & 8:30 AM From Downtown: Between 3:30 PM & 6:30 PM	36
306	UW Bothell-Cascadia CC; downtown Bothell; downtown Seattle	Between Lake City and downtown Seattle	No Access	Bus Tunnel access	No	X				To Downtown Seattle: Between 5:45 AM & 8:30 AM From Downtown: Between 3:30 PM & 7:00 PM	36
308	Bothell; Lake City; downtown Seattle	Between North Seattle and downtown Seattle	No Access	Stewart/Olive	No	X				To Downtown Seattle: Between 5:45 AM & 8:30 AM From Downtown: Between 4:00 PM & 7:00 PM	45
311	Woodinville, Kirkland, downtown Seattle	Between SR 520 and downtown Seattle	SR 520	Stewart/Olive	No	X				To Downtown Seattle: Between 5:00 AM & 8:30 AM From Downtown: Between 3:15 PM & 7:00 PM	26
312	Downtown Bothell; downtown Seattle	Between Lake City and downtown Seattle	No Access	Bus Tunnel access	No	X				To Downtown Seattle: Between 4:30 AM & 9:00 AM From Downtown: Between 2:45 PM & 7:30 PM	14
355	Shoreline; North Seattle, U-District; downtown Seattle	Between Shoreline and downtown Seattle	NE 85th Street; NE 45th Street	Stewart/Olive & James/Jefferson	No	X				To Downtown Seattle: Between 6:00 AM & 9:00 AM From Downtown: Between 3:00 PM & 6:45 PM	23
949	Federal Way; Boeing Everett	Federal Way and Everett	No Access	No Access	No	X				To Boeing: Between 4:30 AM & 5:45 AM From Boeing: Between 2:30 PM & 4:30 PM	180 (only one trip)
<b>Sound Transit</b>											
510	Everett; downtown Seattle	Between SR 526 and downtown Seattle	No Access	Stewart/Olive	No	X	X	X	X	To Downtown: Between 5:00 AM & 11:30 PM From Downtown: Between 6:00 AM & 12:00 AM	To Downtown Seattle: 30 & From Downtown Seattle: 26
511	Everett; Lynnwood; downtown Seattle	Between Everett and downtown Seattle	No Access	Stewart/Olive	No	X	X	X	X	To Downtown: Between 5:00 AM & 11:00 PM From Downtown: Between 6:00 AM & 12:30 AM	To Downtown Seattle: 30 & From Downtown Seattle: 26
513	Everett; downtown Seattle	Between SR 526 and downtown Seattle	No Access	Stewart/Olive	No	X				To Downtown: Between 5:30 AM & 7:45 AM From Downtown: Between 3:30 PM & 6:30 PM	45

Routes Serving Corridor	Major Areas Served	Operations on I-5	I-5 Access Locations (within Study Area)			Hours of Operations				Service Period	Headway (Minutes) in Peaks
			Outside Downtown Seattle	Downtown Seattle	Park-and-Ride Access	Peak	Midday	Early Evening	Late Evening		
522	Woodinville, Bothell; Kenmore; downtown Seattle	Between Lake City and Downtown Seattle	No Access	Pine/Union	No	X	X	X	X	To Downtown: Between 5:00 AM & 12:30 PM From Downtown: Between 5:30 AM & 12:30 AM	To Downtown Seattle: 36 & From Downtown Seattle: 23
545	Redmond; downtown Seattle	Between SR 520 and downtown Seattle	SR 520	Stewart/Olive	No	X	X	X	X	To Downtown: Between 5:00 AM & 11:15 PM From Downtown: Between 5:30 AM & 12:30 AM	To Downtown Seattle: 15 & From Downtown Seattle: 15
555	Issaquah; Bellevue; U-District; Northgate	Between SR 520 and Northgate	SR 520 and Northgate		Yes (Northgate)	X (both Directions)				To Northgate: Between 6:00 AM - 9:00 AM & 3:00 PM - 6:45 PM From Northgate: Between 6:00 AM - 9:00 AM & 3:00 PM - 6:45 PM	To Northgate: 36 & From Northgate: 30
586	Tacoma; U-District	Between downtown Tacoma and U-District	SR 520 and NE 45th Street		No	X				To U-District: Between 5:45 AM & 10:00 AM From U-District: Between 2:30 PM & 7:00 PM	45
590	Tacoma; downtown Seattle	Between downtown Tacoma and downtown Seattle	No Access	S. Spokane Street	No	X				To Downtown: Between 5:00 AM & 9:30 AM From Downtown: Between 2:30 PM & 7:15 PM	8
591	Lakewood; downtown Tacoma; downtown Seattle	Between SR 512 and downtown Seattle	No Access	S. Spokane Street	No	X				To Downtown: Between 4:30 AM & 9:15 AM From Downtown: Between 2:30 PM & 7:30 PM	30
592	DuPont; Lakewood; downtown Seattle	Between DuPont and downtown Seattle	No Access	S. Spokane Street	No	X				To Downtown: Between 5:00 AM & 8:00 AM From Downtown: Between 3:30 PM & 6:30 PM	20
594	Lakewood; downtown Tacoma; downtown Seattle	Between SR 512 and downtown Seattle	No Access	S. Spokane Street	No	X (To Downtown Seattle only )	X	X	X	To Downtown: Between 8:30 AM & 10:45 PM From Downtown: Between 6:45 AM & 12:30 AM	26
595	Gig Harbor; Tacoma Community, downtown Seattle	Between ?? And downtown Seattle	No Access	S. Spokane Street	No	X				To Downtown: Between 4:45 AM & 8:00 AM From Downtown: Between 3:30 PM & 6:45 PM	45
<b>Community Transit</b>											
401	Lynnwood , Downtown Seattle	Between Lynnwood TC and Downtown Seattle	No Access	Howell St	No	X				Approx. 5:00 AM - 9:00 AM & 2:30 PM to 6:30 PM	20
402	Lynnwood TC, Downtown Seattle	Between Lynnwood TC and Downtown Seattle	No Access	Howell St	No	X				Approx. 6:00 AM - 9:00 AM & 3:00 PM to 6:30 PM	15
404	Edmonds, Downtown Seattle	Between Mountlake Terrace and Downtown Seattle	No Access	Howell St	No	X				Approx. 6:00 AM - 9:00 AM & 3:00 PM to 7:30 PM	30
405	Edmonds P&R, Downtown Seattle	Between Mountlake Terrace and Downtown Seattle	No Access	Howell St	No	X (limited)				Approx. 5:00 AM - 6:00 AM & 4:30 PM to 6:00 PM	90 (only two trips)
406	Edmonds, Downtown Seattle	Between Mountlake Terrace and Downtown Seattle	No Access	Terrace St	No	X				Approx. 6:00 AM - 9:00 AM & 3:30 PM to 7:00 PM	36
408	Mountlake Terrace, Downtown Seattle	Between Mountlake Terrace P&R and Downtown Seattle	No Access	Howell St	No	X				Approx. 5:00 AM - 9:00 AM & 3:00 PM to 7:00 PM	30
410	South Everett P&R, Downtown Seattle	Between Mariner P&R and Downtown Seattle	No Access	Howell St	No	X				Approx. 6:00 AM - 9:00 AM & 3:30 PM to 7:00 PM	23
411	South Everett, Downtown Seattle	Between Mariner P&R and Downtown Seattle	No Access	Howell St	No	X				Approx. 6:00 AM - 9:00 AM & 3:30 PM to 7:00 PM	36
412	Silver Firs, Downtown Seattle	Between McCollum Park P&R and Downtown Seattle	No Access	Terrace St	No	X				Approx. 5:00 AM - 9:00 AM & 3:00 PM to 7:00 PM	23
413	Ash Way P&R, Downtown Seattle	Between Ash Way P&R and Downtown Seattle	No Access	Terrace St	No	X				Approx. 5:00 AM - 9:00 AM & 3:00 PM to 7:00 PM	20
414	South Everett, Mountlake Terrace and Downtown Seattle	Between Mountlake Terrace and Downtown Seattle	No Access	Howell St/Terry Ave	No	X (only To Downtown Seattle)	X	X	X	To Downtown Seattle: Between 8:30 AM & 3:50 PM From Downtown Seattle: Between 9:00 AM & 2:30 PM 6:30 PM & 10:00 PM	NA
415	North Lynnwood, Downtown Seattle	Between Swamp Creek P&R and Downtown Seattle	No Access	Howell ST	No	X				Approx. 5:30 AM - 9:00 AM & 3:00 PM to 7:00 PM	30
416	Edmonds, Downtown Seattle	Between Aurora Village and Downtown Seattle	No Access	Terrace St	No	X				Approx. 5:30 AM - 9:00 AM & 3:30 PM to 7:00 PM	26
417	Mukilteo, Downtown Seattle	Between Swamp Creek P&R and Downtown Seattle	No Access	Howell St	No	X				Approx. 6:00 AM - 9:00 AM & 3:30 PM to 7:30 PM	36
421	Marysville, Downtown Seattle	Between Marysville Ash Ave P&R and Downtown Seattle	No Access	Terrace St	No	X				Approx. 4:30 AM - 8:30 AM & 2:30 PM to 7:00 PM	26
422	Stanwood, Downtown Seattle	Between Marysville P&R and Downtown Seattle	No Access	Howell St	No	X				Approx. 5:30 AM - 8:15 AM & 4:00 PM to 6:30 PM	26
424	Snohomish, Monroe, Downtown Seattle	Between Mountlake and Downtown Seattle	NE 45th Freeway Station	Howell St	No	X				Approx. 5:30 AM - 8:15 AM & 4:00 PM to 6:30 PM	60
425	Lake Stevens, downtown Seattle	Between E Hewitt Ave and Downtown Seattle	No Access	Howell St	No	X				To Downtown Seattle: Between 5:15 AM & 8:00 AM From Downtown Seattle: Between 3:30 PM & 6:30 PM	45
435	Mays Pond, Bothell and Downtown Seattle	Between I-405 and Downtown Seattle	No Access	Terrace St	No	X				Approx. 5:30 AM - 8:15 AM & 4:00 PM to 7:00 PM	30
441	Edmonds, Lynnwood, Redmond and Overlake	Between I-405 and Lynnwood	No Access	NA	No	X				Approx. 6:30 AM - 8:00 AM & 4:30 PM to 6:30 PM	90 (only two trips)
477	Brier, Mountlake Terrace and Downtown Seattle	Between Aurora Village and Downtown Seattle	No Access	Terrace St	No	X				Approx. 5:30 AM - 8:30 AM & 3:30 PM to 7:00 PM	30
810	McCollum Park, Lynnwood Edmonds Mountlake Terrace and U District	Mountlake Terrace and U District	45th ST NE	NA	No		X	X		To U-District: Between 9:00 AM & 1:30 PM From U-District: Between 6:30 PM & 10:30 PM	NA
812	University of Washington, McCollum Park	McCollum, University of Washington	45th ST NE	NA	No	X				Approx. 6:00 AM - 8:15 AM & 3:30 PM to 6:30 PM	45

Routes Serving Corridor	Major Areas Served	Operations on I-5	I-5 Access Locations (within Study Area)			Hours of Operations				Service Period	Headway (Minutes) in Peaks
			Outside Downtown Seattle	Downtown Seattle	Park-and-Ride Access	Peak	Midday	Early Evening	Late Evening		
821	University of Washington, Marysville	Marysville, University of Washington	45th ST NE	NA	No	X				Approx.. 5:30 AM - 8:15 AM & 3:30 PM to 7:00 PM	45
851	Edmonds, Mountlake Terrace and U District	Mountlake Terrace and U District	45th ST NE	NA	No	X				Approx.. 7:00 AM - 9:25 AM & 3:30 PM to 6:15 PM	30
855	Lynnwood and U District	Lynnwood and U District	45th ST NE	NA	No	X	X (only from U district)			Approx.. 6:00 AM - 9:30 AM & 12:30 PM to 6:30 PM	30
860	South Everett and U District	Between Mariner P&R and U District	45th ST NE	NA	No	X	X (only from U district)			Approx.. 6:00 AM - 9:30 AM & 12:30 PM to 6:30 PM	45
870	Edmonds, Aurora Village and U District	Aurora village and U District	45th ST NE	NA	No	X				Approx.. 7:00 AM - 9:30 AM & 2:30 PM to 6:30 PM	45
871	Edmonds, Mountlake Terrace and U District	Mountlake Terrace and U District	45th ST NE	NA	No	X (only To U District)	X (only from U District)			Approx.. 6:00 AM - 7:30 AM & 12:30 PM to 2:30 PM	NA
880	Mukilteo, Lynnwood and U District	Lynnwood and U District	45th ST NE	NA	No	X				Approx.. 6:00 AM - 8:30 AM & 3:30 PM to 6:30 PM	36
881	Mukilteo, Lynnwood and U District	Lynnwood and U District	45th ST NE	NA	No	X ( limited service)				Approx.. 7:00 AM - 8:30 AM & 3:00 PM to 4:00 PM	180 (only one trip)
<b>UW Transportation Services</b>											
Health Sciences Express	UW Medical Center; Harborview Medical Center	Between UW campus and Harborview MC				X	X			6:00 AM	

**APPENDIX D**  
**Traffic Safety Data**

SR 900 156 to 157.8

**Southbound**

	off-ramp HOV La	Interurban on SB	SB on-ramp SR 99	SR900	SB off ramp	NB mainline :
all other single vehicle involvement	0	0	0	0	0	0
jackknife trailer	0	0	0	0	0	0
All other MULTI VEHICLE involvements	0	0	0	0	0	1
Non-collision FIRE	1	0	0	0	0	2
Pedestrian STRUCK by vehicle	0	0	0	0	0	0
Ran into roadway DITCH	0	0	0	0	0	1
SIDESWIPE on LEFT SIDE by other vehicle	0	0	0	0	0	0
SIDESWIPE on RIGHT SIDE by other vehicle	0	0	1	0	0	1
Sideswipes LEFT side of other vehicle	1	2	0	0	0	7
Sideswipes RIGHT side of other vehicle	0	0	0	0	0	9
Strikes APPURTENANCE	4	1	0	1	1	16
Strikes front end of other vehicle (not head on)	0	0	1	0	0	0
Strikes LEFT side of other vehicle AT ANGLE	0	3	0	0	0	2
Strikes or was struck by OBJECT from other vehicle	1	0	0	0	0	0
Strikes or was struck by WORKING OBJECT	0	0	0	0	0	1
Strikes other OBJECT	1	0	0	0	0	2
Strikes other vehicle head on	0	0	0	0	0	0
Strikes REAR end of other vehicle	6	4	1	3	3	21
Strikes RIGHT side of other vehicle AT ANGLE	1	3	0	0	0	6
Struck in FRONT END by other vehicle (not head on)	0	0	0	0	0	0
Struck in REAR END by other vehicle	1	0	1	2	2	6
STRUCK on LEFT side at ANGLE by other vehicle	1	0	1	1	0	3
STRUCK on RIGHT side at ANGLE by other vehicle	0	0	0	0	0	2
Vehicle OVERTURNED	0	1	1	1	0	1
was STRUCK by other vehicle HEAD On	0	0	0	0	0	0
Subtotal =	17	14	6	6	6	81

Ramps	
Interurban to I-90	166
I-90 to Mercer	488
Interurban to Northgate Way	680
Northgate Way to 220th	143
Mainlines	
Interurban to I-90	318
I-90 to Mercer	897
Lakeview Blvd to Northgate Way	1055
Northgate Way to 220th	439

TOTAL NUMBER OF ACCIDENTS	
Interurban to I-90	484
I-90 to Mercer	1385
Mercer to Northgate Way	1735
Northgate Way to 220th	582

Southbound	Boeing ACC 157.81-160.65		Swift 160.66-161.15		Albro 161.16-161.41
	SB boeing acc	Mainline :	SB albro on-ramp	Mainline :	Mainline
all other single vehicle involvement	0	0	0	0	0
jackknife trailer	0	0	0	0	0
All other MULTI VEHICLE involvements	0	0	0	0	0
Non-collision FIRE	2	6	0	0	0
Pedestrian STRUCK by vehicle	0	0	0	0	0
Ran into roadway DITCH	0	3	0	0	0
SIDESWIPE on LEFT SIDE by other vehicle	0	2	0	0	2
SIDESWIPE on RIGHT SIDE by other vehicle	0	0	0	1	0
Sideswipes LEFT side of other vehicle	2	8	1	1	3
Sideswipes RIGHT side of other vehicle	0	9	0	1	1
Strikes APPURTENANCE	3	26	0	6	5
Strikes front end of other vehicle (not head on)	1	1	0	0	1
Strikes LEFT side of other vehicle AT ANGLE	0	7	0	0	2
Strikes or was struck by OBJECT from other vehicle	1	1	0	1	0
Strikes or was struck by WORKING OBJECT	0	0	0	0	0
Strikes other OBJECT	1	2	0	0	0
Strikes other vehicle head on	0	0	0	0	0
Strikes REAR end of other vehicle	4	10	2	2	6
Strikes RIGHT side of other vehicle AT ANGLE	1	7	0	0	0
Struck in FRONT END by other vehicle (not head on)	0	0	0	0	0
Struck in REAR END by other vehicle	0	11	0	0	1
STRUCK on LEFT side at ANGLE by other vehicle	0	7	0	1	1
STRUCK on RIGHT side at ANGLE by other vehicle	0	1	0	0	0
Vehicle OVERTURNED	1	5	0	0	0
was STRUCK by other vehicle HEAD On	0	0	0	0	0
Subtotal =	16	106	3	13	22

Ramps	
Interurban to I-90	166
I-90 to Mercer	488
Interurban to Northgate Way	680
Northgate Way to 220th	143
Mainlines	
Interurban to I-90	318
I-90 to Mercer	897
Lakeview Blvd to Northgate Way	1055
Northgate Way to 220th	439

TOTAL NUMBER OF ACCIDENTS	
Interurban to I-90	484
I-90 to Mercer	1385
Mercer to Northgate Way	1735
Northgate Way to 220th	582

Southbound	Corson 161.42-162.35			Spo&Col 162.36-163.1		
	SB Off Albro	FSB Off Ramp	Mainline	SB On Ramp C	SB On Ramp E	Mainline
all other single vehicle involvement	0	0	0	0	0	0
jackknife trailer	0	0	0	0	0	0
All other MULTI VEHICLE involvements	0	0	0	0	0	2
Non-collision FIRE	0	0	1	0	1	0
Pedestrian STRUCK by vehicle	0	0	0	0	0	0
Ran into roadway DITCH	0	0	0	0	0	0
SIDESWIPE on LEFT SIDE by other vehicle	0	1	2	2	0	2
SIDESWIPE on RIGHT SIDE by other vehicle	1	0	0	2	0	3
Sideswipes LEFT side of other vehicle	1	0	5	1	1	6
Sideswipes RIGHT side of other vehicle	0	1	5	1	5	12
Strikes APPURTENANCE	2	6	9	6	12	13
Strikes front end of other vehicle (not head on)	0	0	0	0	6	1
Strikes LEFT side of other vehicle AT ANGLE	0	0	1	0	5	4
Strikes or was struck by OBJECT from other vehicle	0	0	0	1	0	0
Strikes or was struck by WORKING OBJECT	0	0	0	0	0	0
Strikes other OBJECT	0	0	0	0	0	2
Strikes other vehicle head on	0	0	0	0	1	1
Strikes REAR end of other vehicle	3	5	7	4	10	16
Strikes RIGHT side of other vehicle AT ANGLE	0	0	2	0	9	4
Struck in FRONT END by other vehicle (not head on)	0	0	1	0	2	0
Struck in REAR END by other vehicle	0	3	3	1	4	3
STRUCK on LEFT side at ANGLE by other vehicle	0	0	0	0	1	1
STRUCK on RIGHT side at ANGLE by other vehicle	0	1	2	0	3	1
Vehicle OVERTURNED	0	0	0	0	2	0
was STRUCK by other vehicle HEAD On	0	0	0	0	0	0
Subtotal =	7	17	38	18	62	71

Ramps	
Interurban to I-90	166
I-90 to Mercer	488
Interurban to Northgate Way	680
Northgate Way to 220th	143
Mainlines	
Interurban to I-90	318
I-90 to Mercer	897
Lakeview Blvd to Northgate Way	1055
Northgate Way to 220th	439

TOTAL NUMBER OF ACCIDENTS	
Interurban to I-90	484
I-90 to Mercer	1385
Mercer to Northgate Way	1735
Northgate Way to 220th	582

Southbound	Spo&Col 163.11-163.1			SR 901 162.36-163.1		SR 901-164.06-165.19
	SB ON RAMP ( SB ON RAMP	SB ON RAMP	Mainline	SBCD on-ra	Mainline	Mainline
all other single vehicle involvement	0	0	0	0	0	0
jackknife trailer	0	0	0	0	0	0
All other MULTI VEHICLE involvements	0	0	0	0	0	0
Non-collision FIRE	2	0	2	0	0	2
Pedestrian STRUCK by vehicle	0	0	0	0	0	0
Ran into roadway DITCH	0	0	0	0	0	0
SIDESWIPE on LEFT SIDE by other vehicle	0	0	0	0	1	1
SIDESWIPE on RIGHT SIDE by other vehicle	0	1	3	2	0	0
Sideswipes LEFT side of other vehicle	3	1	6	2	2	11
Sideswipes RIGHT side of other vehicle	2	3	9	2	2	14
Strikes APPURTENANCE	3	4	13	5	8	30
Strikes front end of other vehicle (not head on)	1	0	3	0	1	1
Strikes LEFT side of other vehicle AT ANGLE	4	1	7	2	2	7
Strikes or was struck by OBJECT from other vehicle	0	0	0	0	0	0
Strikes or was struck by WORKING OBJECT	0	0	0	0	0	1
Strikes other OBJECT	0	0	0	0	1	0
Strikes other vehicle head on	0	0	0	0	0	1
Strikes REAR end of other vehicle	7	6	29	17	14	191
Strikes RIGHT side of other vehicle AT ANGLE	2	0	4	0	0	7
Struck in FRONT END by other vehicle (not head on)	0	0	0	0	0	0
Struck in REAR END by other vehicle	3	0	7	2	5	23
STRUCK on LEFT side at ANGLE by other vehicle	1	1	4	2	0	3
STRUCK on RIGHT side at ANGLE by other vehicle	0	0	0	1	1	1
Vehicle OVERTURNED	0	0	0	0	0	1
was STRUCK by other vehicle HEAD On	0	0	0	0	0	0
Subtotal =	28	17	87	35	37	294

Ramps	
Interurban to I-90	166
I-90 to Mercer	488
Interurban to Northgate Way	680
Northgate Way to 220th	143
Mainlines	
Interurban to I-90	318
I-90 to Mercer	897
Lakeview Blvd to Northgate Way	1055
Northgate Way to 220th	439

TOTAL NUMBER OF ACCIDENTS	
Interurban to I-90	484
I-90 to Mercer	1385
Mercer to Northgate Way	1735
Northgate Way to 220th	582

Southbound	James & Madison 165.2-165.56		James & Madison 165.57-166.28		Union Olive 165.82-166.28		
	exit to NB express	Mainline	SBCD off, NBC	Mainline	SB OFF RAMP	SB ON RAMP	Mainline
all other single vehicle involvement	0	0	0	0	0	0	0
jackknife trailer	0	0	0	0	0	0	0
All other MULTI VEHICLE involvements	0	0	0	0	0	0	1
Non-collision FIRE	0	0	0	0	1	0	1
Pedestrian STRUCK by vehicle	0	1	0	0	0	0	0
Ran into roadway DITCH	0	0	0	0	0	0	0
SIDESWIPE on LEFT SIDE by other vehicle	0	0	0	4	2	0	2
SIDESWIPE on RIGHT SIDE by other vehicle	0	0	1	0	2	1	0
Sideswipes LEFT side of other vehicle	2	2	1	3	6	2	3
Sideswipes RIGHT side of other vehicle	1	3	4	4	5	1	6
Strikes APPURTENANCE	2	6	0	0	9	2	8
Strikes front end of other vehicle (not head on)	0	1	1	1	1	1	1
Strikes LEFT side of other vehicle AT ANGLE	0	3	0	0	4	1	2
Strikes or was struck by OBJECT from other vehicle	0	0	0	0	0	0	0
Strikes or was struck by WORKING OBJECT	0	0	0	0	0	0	0
Strikes other OBJECT	0	0	0	0	1	0	0
Strikes other vehicle head on	0	0	0	0	0	0	0
Strikes REAR end of other vehicle	8	24	13	18	92	29	78
Strikes RIGHT side of other vehicle AT ANGLE	2	2	3	2	4	1	1
Struck in FRONT END by other vehicle (not head on)	0	0	0	0	0	0	0
Struck in REAR END by other vehicle	4	2	4	4	17	4	14
STRUCK on LEFT side at ANGLE by other vehicle	0	1	0	0	0	0	0
STRUCK on RIGHT side at ANGLE by other vehicle	1	0	0	0	2	2	3
Vehicle OVERTURNED	0	0	0	0	1	1	0
was STRUCK by other vehicle HEAD On	0	0	0	0	0	0	0
Subtotal =	20	45	27	36	147	45	120

Ramps	
Interurban to I-90	166
I-90 to Mercer	488
Interurban to Northgate Way	680
Northgate Way to 220th	143
Mainlines	
Interurban to I-90	318
I-90 to Mercer	897
Lakeview Blvd to Northgate Way	1055
Northgate Way to 220th	439

TOTAL NUMBER OF ACCIDENTS	
Interurban to I-90	484
I-90 to Mercer	1385
Mercer to Northgate Way	1735
Northgate Way to 220th	582

**Southbound**

	Stew Denn Mercer 166.29-167.49				Roa & Boylston 167.5-168.85			
	SB	ON RA	SB Stewar	SB Mercer	Mainline	SB SR 520	SB SR 520	Mainline
all other single vehicle involvement	0	0	0	0	0	0	0	0
jackknife trailer	0	0	0	0	0	0	0	0
All other MULTI VEHICLE involvements	0	0	0	0	0	0	0	0
Non-collision FIRE	0	0	0	0	0	0	1	0
Pedestrian STRUCK by vehicle	0	0	0	0	0	0	0	0
Ran into roadway DITCH	0	0	0	0	0	0	0	0
SIDESWIPE on LEFT SIDE by other vehicle	1	0	1	3	3	0	1	1
SIDESWIPE on RIGHT SIDE by other vehicle	0	0	0	1	1	0	2	0
Sideswipes LEFT side of other vehicle	6	1	3	15	15	1	3	14
Sideswipes RIGHT side of other vehicle	3	1	3	15	15	2	1	4
Strikes APPURTENANCE	1	1	10	24	24	0	4	20
Strikes front end of other vehicle (not head on)	1	0	0	4	4	0	2	1
Strikes LEFT side of other vehicle AT ANGLE	3	2	0	7	7	1	3	6
Strikes or was struck by OBJECT from other vehicle	0	0	1	1	1	1	0	0
Strikes or was struck by WORKING OBJECT	0	0	1	0	0	0	0	1
Strikes other OBJECT	0	1	0	0	0	0	0	0
Strikes other vehicle head on	0	0	0	0	0	0	0	0
Strikes REAR end of other vehicle	33	18	39	171	171	12	38	110
Strikes RIGHT side of other vehicle AT ANGLE	4	2	0	7	7	1	0	4
Struck in FRONT END by other vehicle (not head on)	1	0	0	1	1	0	0	0
Struck in REAR END by other vehicle	4	5	21	21	21	1	9	18
STRUCK on LEFT side at ANGLE by other vehicle	1	0	1	3	3	0	0	1
STRUCK on RIGHT side at ANGLE by other vehicle	0	0	0	4	4	0	0	4
Vehicle OVERTURNED	0	0	0	0	0	0	0	0
was STRUCK by other vehicle HEAD On	0	0	0	1	1	0	0	0
Subtotal =	58	31	80	278	278	19	64	184

Ramps	
Interurban to I-90	166
I-90 to Mercer	488
Interurban to Northgate Way	680
Northgate Way to 220th	143
Mainlines	
Interurban to I-90	318
I-90 to Mercer	897
Lakeview Blvd to Northgate Way	1055
Northgate Way to 220th	439

TOTAL NUMBER OF ACCIDENTS	
Interurban to I-90	484
I-90 to Mercer	1385
Mercer to Northgate Way	1735
Northgate Way to 220th	582

Southbound	45 & 50th 168.86-169.92				65th & LCW 169.93-170.97				80 & 85th 170-171.9			
	SB 45th Or SB 50th on SB Ravenr	Mainline	SB 45/50th SB SR 522 SB SR522 off	SB 85th on SB 80-85th	Mainline							
all other single vehicle involvement	0	0	0	0	0	0	0	0	0	0	0	
jackknife trailer	0	0	0	0	0	0	0	0	0	0	0	
All other MULTI VEHICLE involvements	0	0	0	0	0	0	0	0	0	0	0	
Non-collision FIRE	0	0	0	0	0	0	0	0	0	0	0	
Pedestrian STRUCK by vehicle	0	0	0	0	1	0	0	0	0	0	0	
Ran into roadway DITCH	0	0	0	0	0	0	1	0	0	0	0	
SIDESWIPE on LEFT SIDE by other vehicle	0	1	0	0	0	0	3	0	0	2		
SIDESWIPE on RIGHT SIDE by other vehicle	0	1	0	0	1	0	0	0	0	0		
Sideswipes LEFT side of other vehicle	0	1	2	8	0	2	6	0	1	4		
Sideswipes RIGHT side of other vehicle	1	1	2	9	1	2	5	2	2	1		
Strikes APPURTENANCE	2	1	7	20	2	7	17	3	3	13		
Strikes front end of other vehicle (not head on)	0	1	0	1	0	0	1	0	0	0		
Strikes LEFT side of other vehicle AT ANGLE	1	0	1	4	0	0	3	1	0	2		
Strikes or was struck by OBJECT from other vehicle	2	0	0	0	0	0	0	0	0	0		
Strikes or was struck by WORKING OBJECT	1	0	0	0	0	0	0	2	0	0		
Strikes other OBJECT	0	0	1	1	0	0	1	0	0	0		
Strikes other vehicle head on	0	0	0	1	0	0	0	0	0	0		
Strikes REAR end of other vehicle	32	40	50	195	12	26	130	25	17	100		
Strikes RIGHT side of other vehicle AT ANGLE	1	1	0	5	1	0	4	0	0	2		
Struck in FRONT END by other vehicle (not head on)	0	0	0	0	0	0	0	0	0	0		
Struck in REAR END by other vehicle	7	8	5	36	7	5	21	1	0	18		
STRUCK on LEFT side at ANGLE by other vehicle	0	0	1	0	1	0	0	0	0	1		
STRUCK on RIGHT side at ANGLE by other vehicle	0	0	0	2	0	1	2	0	0	1		
Vehicle OVERTURNED	0	0	0	0	0	0	0	0	0	3		
was STRUCK by other vehicle HEAD On	0	0	0	0	0	0	0	0	0	0		
Subtotal =	47	55	69	282	26	43	194	34	23	147		

Ramps	
Interurban to I-90	166
I-90 to Mercer	488
Interurban to Northgate Way	680
Northgate Way to 220th	143
Mainlines	
Interurban to I-90	318
I-90 to Mercer	897
Lakeview Blvd to Northgate Way	1055
Northgate Way to 220th	439

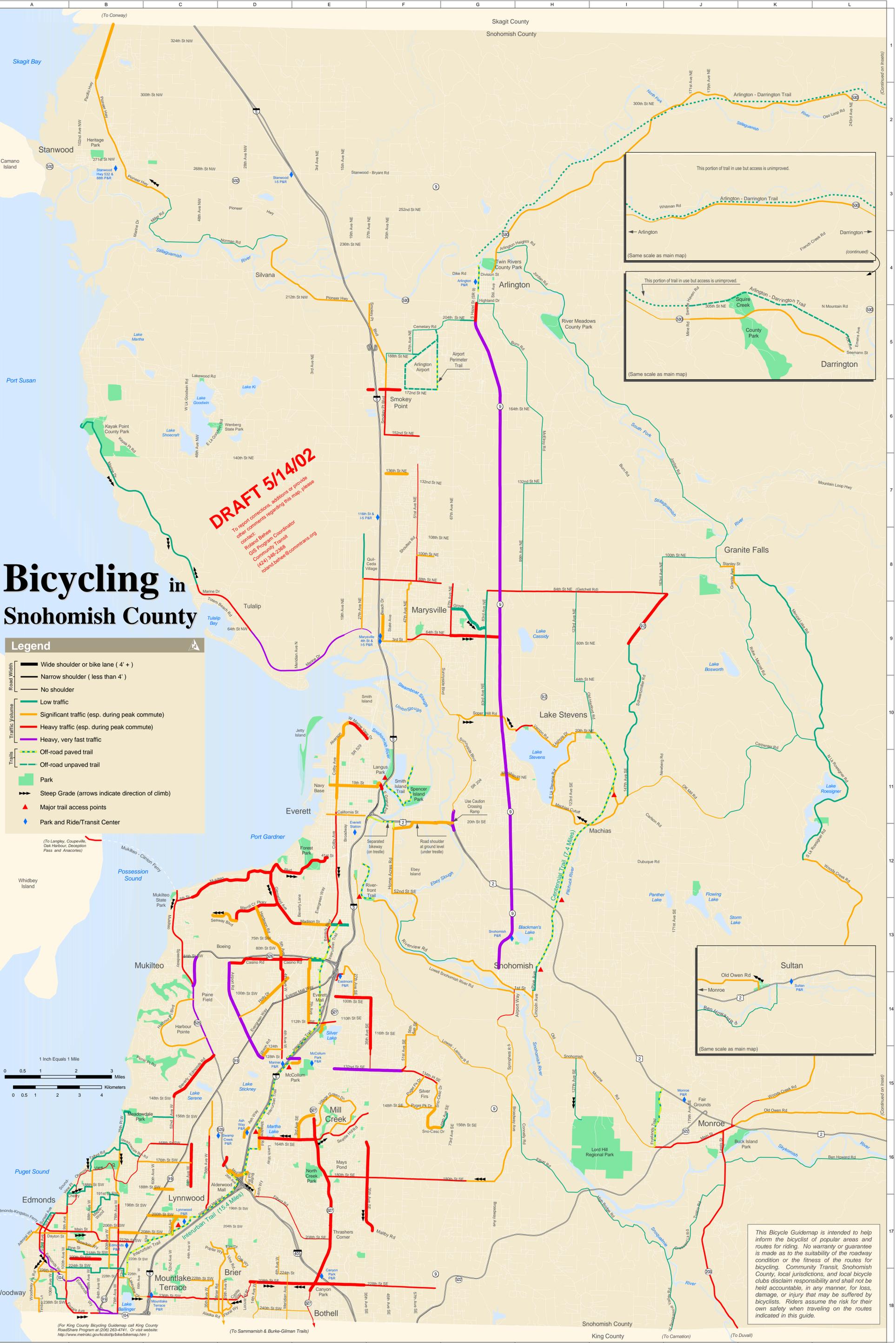
TOTAL NUMBER OF ACCIDENTS	
Interurban to I-90	484
I-90 to Mercer	1385
Mercer to Northgate Way	1735
Northgate Way to 220th	582

Southbound	85th 171.91-173		NGW 173.01-174			Southbound North 174.1-180		Southbound Express Lanes	
	SBCD on (	Mainline	sbcd off	NB 5th/roo	Mainline				
all other single vehicle involvement	0	0	0	0	0		3		0
jackknife trailer	0	0	0	0	0		2		1
All other MULTI VEHICLE involvements	0	0	0	0	0		0		1
Non-collision FIRE	0	1	0	0	1		2		0
Pedestrian STRUCK by vehicle	0	0	0	0	0		0		0
Ran into roadway DITCH	0	0	0	0	2		4		0
SIDESWIPE on LEFT SIDE by other vehicle	0	3	1	0	1		6		0
SIDESWIPE on RIGHT SIDE by other vehicle	0	0	0	0	2		7		2
Sideswipes LEFT side of other vehicle	0	12	1	0	6		23		2
Sideswipes RIGHT side of other vehicle	1	10	1	1	6		20		5
Strikes APPURTENANCE	3	30	2	1	14		50		18
Strikes front end of other vehicle (not head on)	0	4	1	0	2		5		0
Strikes LEFT side of other vehicle AT ANGLE	2	11	2	0	1		11		5
Strikes or was struck by OBJECT from other vehicle	0	0	0	0	1		9		0
Strikes or was struck by WORKING OBJECT	0	1	1	0	0		0		0
Strikes other OBJECT	1	0	0	0	2		9		1
Strikes other vehicle head on	0	0	0	0	0		0		0
Strikes REAR end of other vehicle	18	165	35	11	87		341		109
Strikes RIGHT side of other vehicle AT ANGLE	4	9	0	1	6		8		3
Struck in FRONT END by other vehicle (not head on)	0	0	0	0	0		0		0
Struck in REAR END by other vehicle	4	31	7	3	18		64		21
STRUCK on LEFT side at ANGLE by other vehicle	0	0	1	0	2		6		1
STRUCK on RIGHT side at ANGLE by other vehicle	0	5	0	0	1		3		0
Vehicle OVERTURNED	3	3	1	0	4		9		5
was STRUCK by other vehicle HEAD On	0	0	0	0	1		0		0
Subtotal =	36	285	53	17	157		582		174

Ramps	
Interurban to I-90	166
I-90 to Mercer	488
Interurban to Northgate Way	680
Northgate Way to 220th	143
Mainlines	
Interurban to I-90	318
I-90 to Mercer	897
Lakeview Blvd to Northgate Way	1055
Northgate Way to 220th	439

TOTAL NUMBER OF ACCIDENTS	
Interurban to I-90	484
I-90 to Mercer	1385
Mercer to Northgate Way	1735
Northgate Way to 220th	582

**APPENDIX E**  
**Regional Non Motorized Plans**



**DRAFT 5/14/02**  
 To report corrections, additions or provide  
 other comments regarding this map, please  
 contact:  
 Roland DeBee  
 GIS Program Coordinator  
 Community Transit  
 (424) 348-2388  
 roland.debee@comtrans.org

# Bicycling in Snohomish County

**Legend**

- Road Width**
  - Wide shoulder or bike lane (4' +)
  - Narrow shoulder (less than 4')
  - No shoulder
- Traffic Volume**
  - Low traffic
  - Significant traffic (esp. during peak commute)
  - Heavy traffic (esp. during peak commute)
  - Heavy, very fast traffic
- Trails**
  - Off-road paved trail
  - Off-road unpaved trail
- Park**
- Steep Grade** (arrows indicate direction of climb)
- Major trail access points**
- Park and Ride/Transit Center**

This portion of trail in use but access is unimproved.

(Same scale as main map)

This portion of trail in use but access is unimproved.

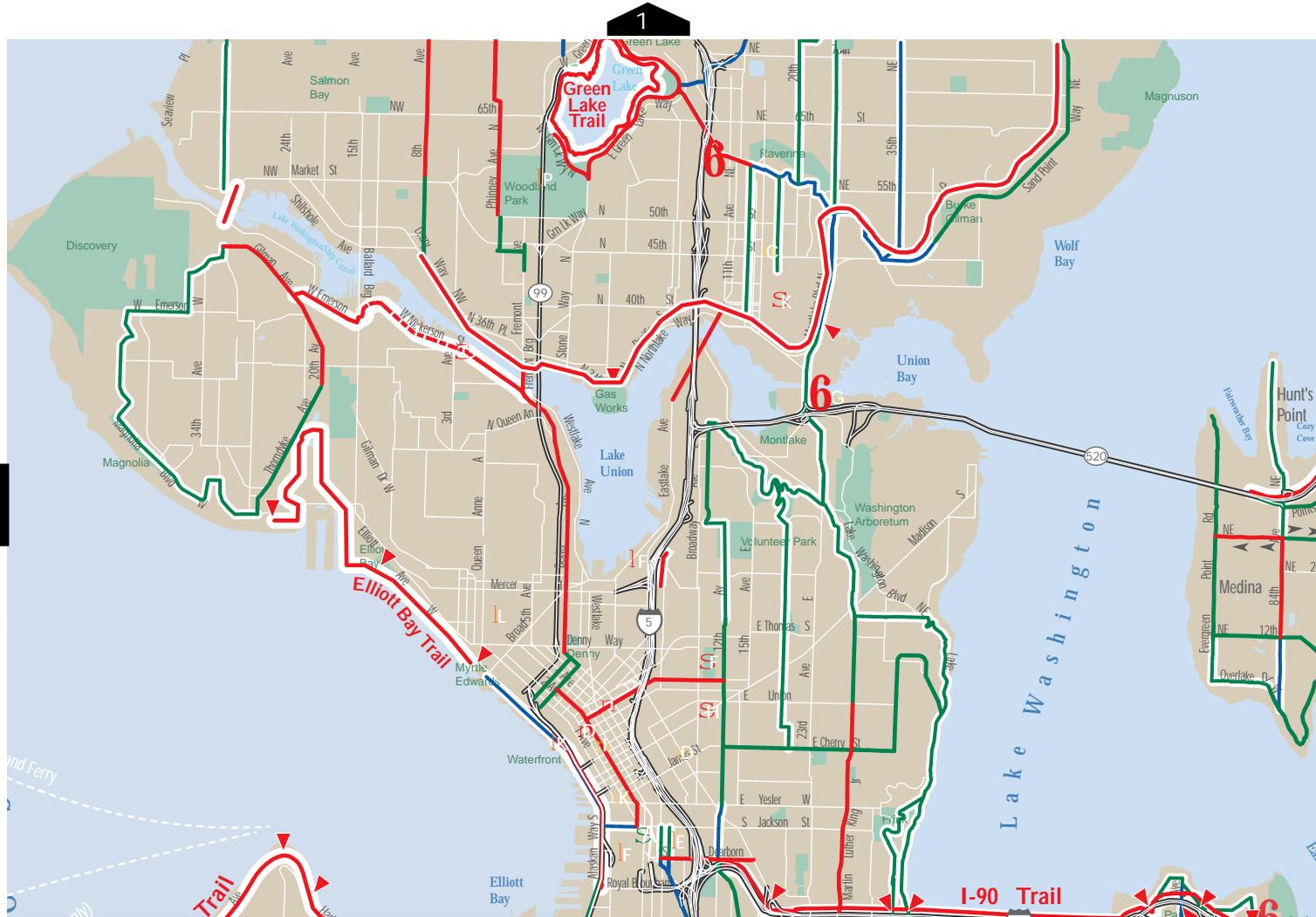
(Same scale as main map)

This portion of trail in use but access is unimproved.

(Same scale as main map)

This Bicycle Guidemap is intended to help inform the bicyclist of popular areas and routes for riding. No warranty or guarantee is made as to the suitability of the roadway condition or the fitness of the routes for bicycling. Community Transit, Snohomish County, local jurisdictions, and local bicycle clubs disclaim responsibility and shall not be held accountable, in any manner, for loss, damage, or injury that may be suffered by bicyclists. Riders assume the risk for their own safety when traveling on the routes indicated in this guide.

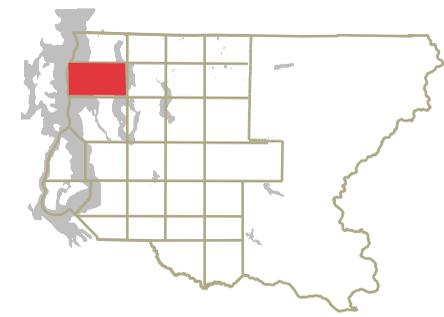
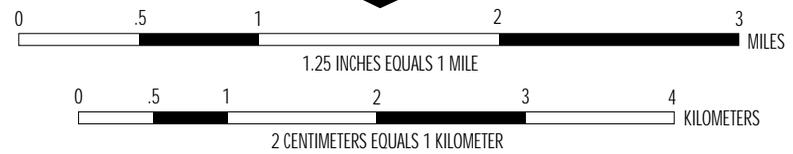
(For King County Bicycling Guidemap call King County RoadShare Program at (206) 263-4741. Or visit website: <http://www.metrokc.gov/ksdot/bike/bikemap.htm>)

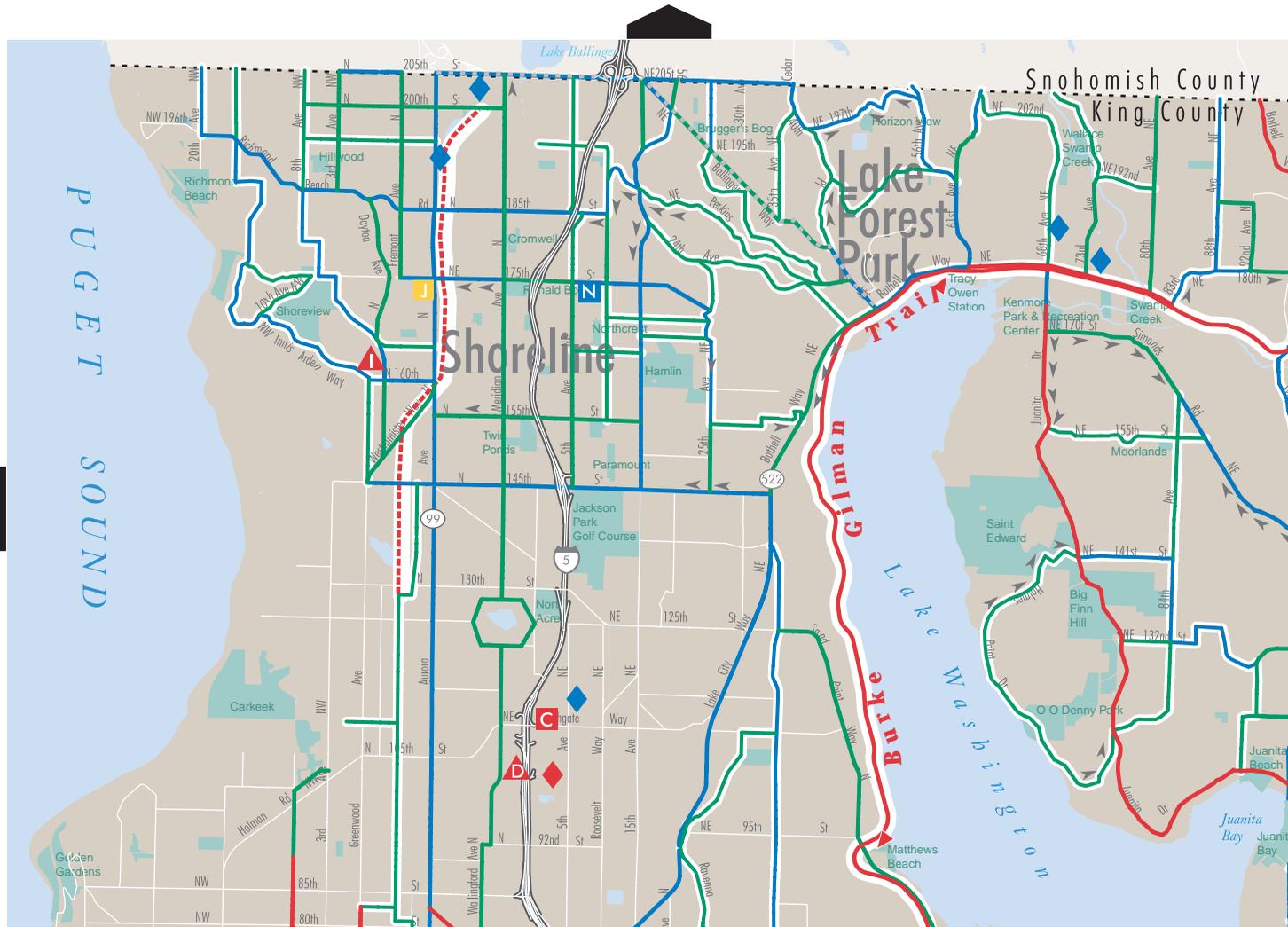


## Bicycling in King County

N

- Paved regional trail
- On street bicycle lane
- Soft surface regional trail
- Low traffic street with or without wide curb lane
- Moderate to heavy traffic with wide curb lane or paved shoulder
- Moderate traffic street without wide curb lane or shoulder
- Heavy traffic street without wide curb lane or shoulder
- Planned regional trail - paved
- Use routes with caution (color coded to match classification)
- Major trail access points
- Steep grade (arrows indicate direction of climb)
- Park and Ride/Transit Center with racks
- Park and Ride/Transit Center with racks and lockers
- Park





# Bicycling in King County



- Paved regional trail
- On street bicycle lane
- Soft surface regional trail
- Low traffic street with or without wide curb lane
- Moderate to heavy traffic with wide curb lane or paved shoulder
- Moderate traffic street without wide curb lane or shoulder
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- Major trail access points
- Steep grade (arrows indicate direction of climb)
- Park and Ride/Transit Center with racks
- Park and Ride/Transit Center with racks and lockers
- Park

0 .5 1 2 3 MILES

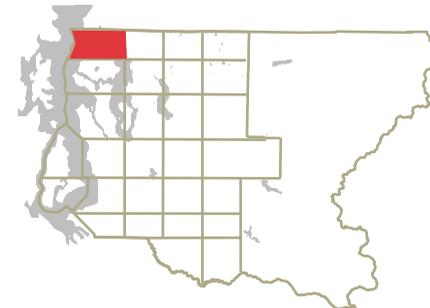
1.25 INCHES EQUALS 1 MILE

0 .5 1 2 3 4 KILOMETERS

2 CENTIMETERS EQUALS 1 KILOMETER



King County  
Department of Transportation  
TRANSPORTATION PLANNING



## **APPENDIX F**

### **Non Motorized Facilities in Communities Near the I-5 Corridor**

**Legend**

- School Sites

**MOUNTLAKE TERRACE PLANS PROPOSALS**

- Existing Off-road Walkways (some not maintained)
- Trail Plan\*  
Source: Comprehensive Park and Recreation Plan, Adopted 1983
- Bicycle Plan  
Source: Transportation Plan, Park and Recreation Plan, Adopted 1985
- Future Walkways Improvements - Draft Approved by Planning Commission, January 27, 2003  
Source: Staff Recommendations and Citizen Requests

**OTHER AGENCY PLANS PROPOSALS**

- Lynnwood Plan
- PSRC Recommended Improvements
- Brier Trail Plan
- Edmonds Plan
- Shoreline Plan
- Lake Forest Park Plan
- Snohomish County Plan

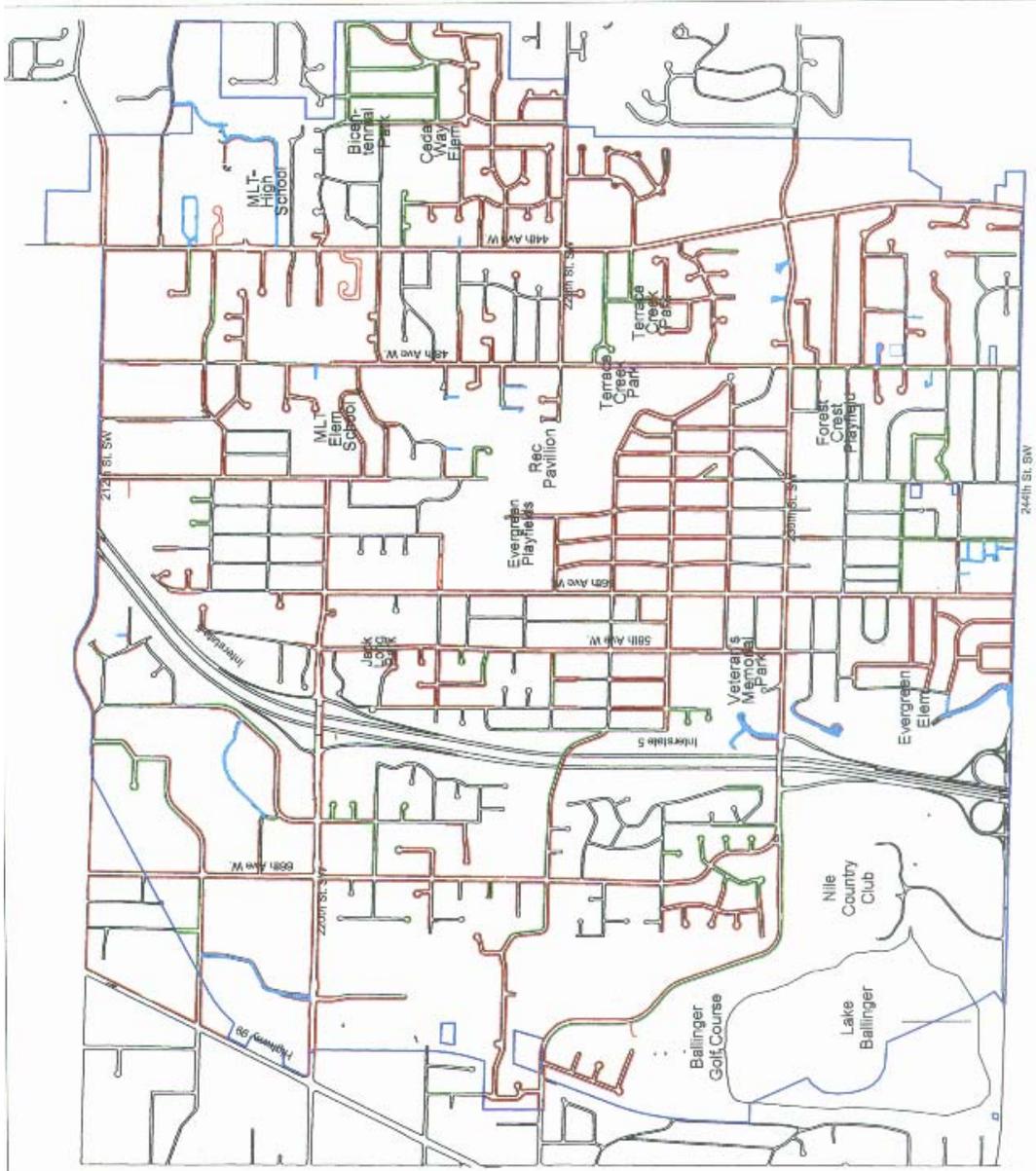
\*Note: Plans that have been implemented may not be shown



Figure TR-7

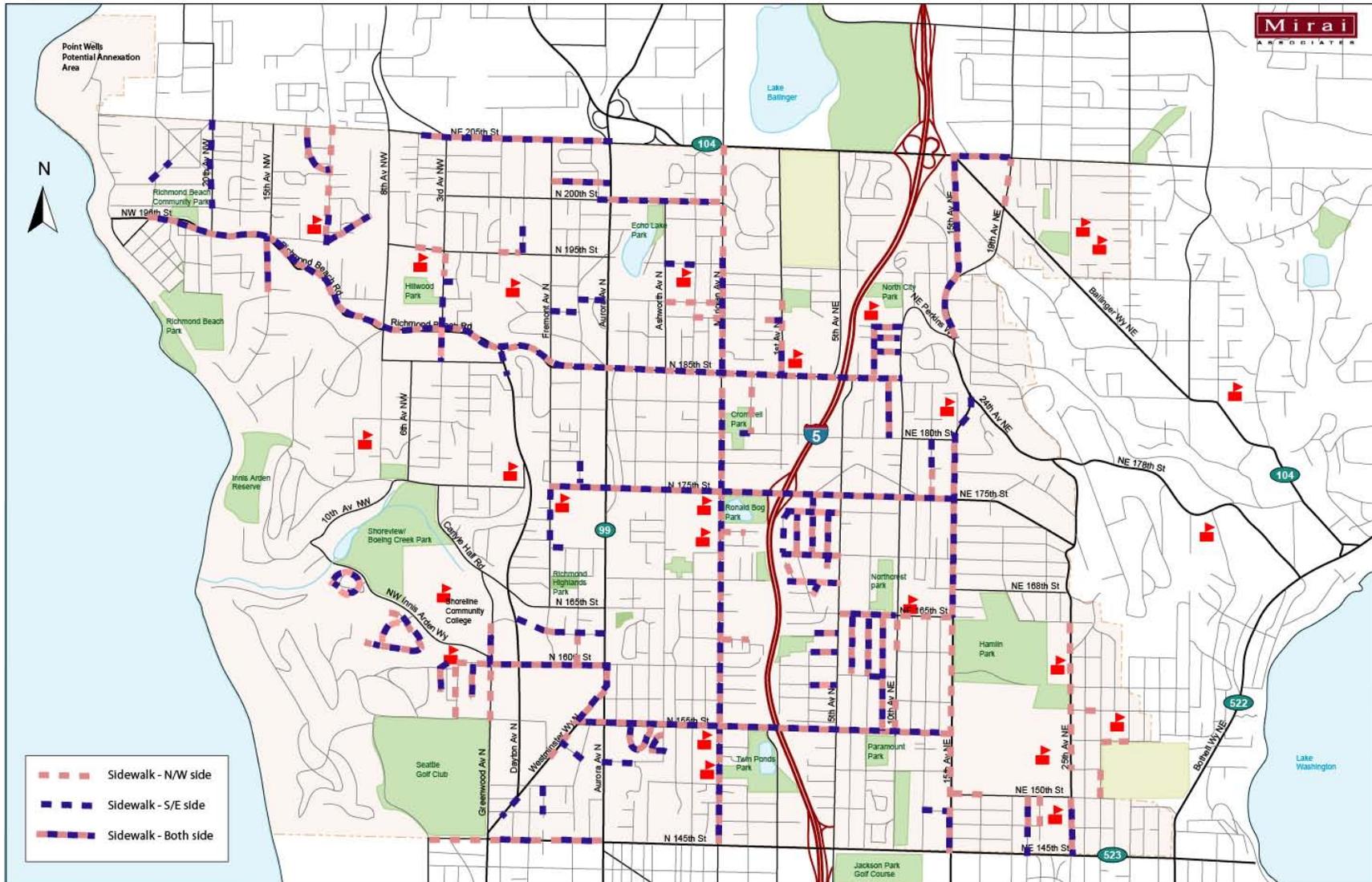
**Non-Motorized Travel**

FIGURE TR-4  
CITY OF MOUNTLAKE TERRACE  
SIDEWALK INVENTORY



\*Information Confirmed 2001

Figure 2-5. Existing Sidewalks



(available in 11" x 17" format)

A B C D E F G H I J

1 2 3 4 5 6 7 8 9 10 11



**KING STREET STATION TRANSIT HUB**  
 Amtrak - Trains & Buses  
 Sounder Commuter Rail  
 Metro Transit Bus Tunnel Station  
 (future LINK Light Rail Station)  
 Future Monorail Station  
 Bikestation Seattle

**DOWNTOWN**  
 \* See inset for details

5.1 mi (8.2 km) to Tracy Owen Station, Kenmore

7.2 mi (11.6 km) to Matthews Beach

190 Trail Approx. 2 mi (3.3 km) to Mercer Island

190 TRAIL  
 \* See inset for details

Ferries to Bainbridge Island and Bremerton  
 Bicycles Welcome

A B C D E F G H I J

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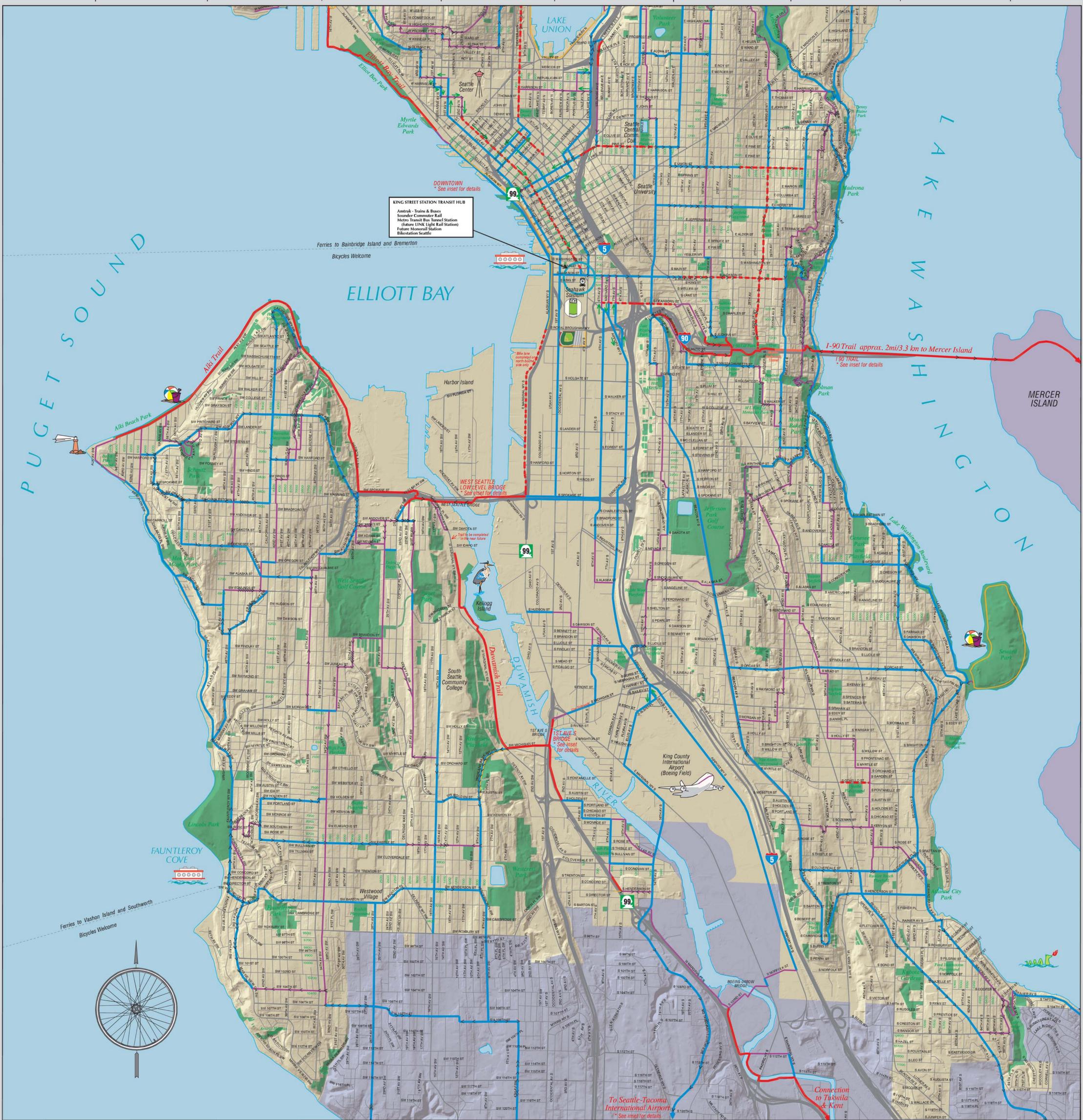
16

16

17

17

A B C D E F G H I J



**KING STREET STATION TRANSIT HUB**  
 Amtrak - Trains & Buses  
 Sounder Commuter Rail  
 Metro Transit Bus Rapid Station  
 Future Link Light Rail Station  
 Future Monorail Station  
 Bikes Welcome Seattle

Ferries to Bainbridge Island and Bremerton  
 Bicycles Welcome

**I-90 Trail approx. 2mi/3.3 km to Mercer Island**  
 \* See inset for details

**To Seattle-Tacoma International Airport**  
 \* See inset for details

**Connection to Tukwila & Kent**



Ferries to Vashon Island and Southworth  
 Bicycles Welcome

PUGET SOUND

ELLIOTT BAY

LAKE WASHINGTON

MERCER ISLAND

DUWAMISH RIVER

King County International Airport  
 (Boeing Field)

WEST SEATTLE LOW LEVEL BRIDGE

South Seattle Community College

FAUNTLEROY COVE

Westwood Village

Westwood Park

Lincoln Park

West Seattle Golf Course

Alki Trail

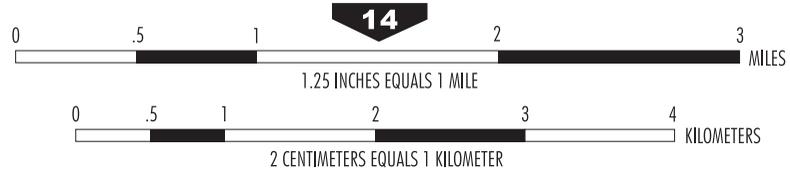
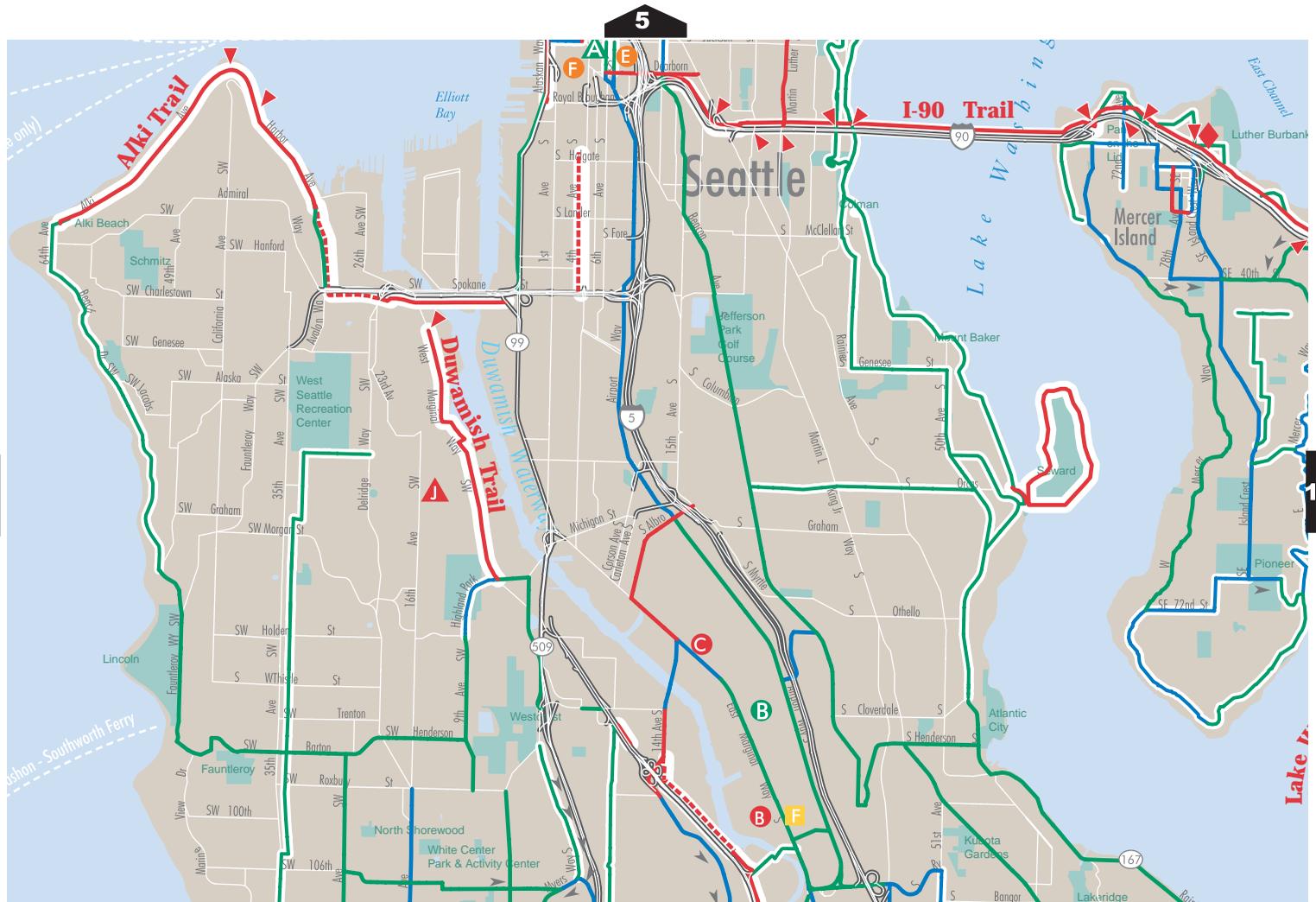
Alki Beach Park

West Seattle Golf Course

South Seattle Community College

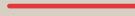
Westwood Park





## Bicycling in King County

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-  Park and Ride/Transit Center with racks and lockers
-  Park

