CHAPTER 4: EXISTING CONDITIONS

The SLU neighborhood comprises a mixture of both employment and residential land uses. The area includes a number of auto-oriented businesses and accommodates a significant number of non-destination trips between I-5 and Aurora Avenue (SR-99) to/from nearby neighborhoods and major attractions (i.e., Seattle Center, Waterfront, etc). Significant roadways in the study area are described below.

Roadway Network

The existing roadway network in the South Lake Union study area consists of a variety of local streets and arterial types. These roadways range from two-lane local streets to major primary arterials. Figure 4.1 shows the existing roadway network and the following section describes key roadways in the project area.

East-West Roadways

Mercer Street is a principal arterial with four eastbound lanes from Queen Anne Avenue to Fairview Avenue. Mercer Street serves as a primary connection to I-5 from the Queen Anne, Ballard, Magnolia, and downtown neighborhoods. Mercer Street operates as a couplet with Valley Street, between Westlake Avenue N. and Fairview Avenue N, and both are designated major truck streets in this segment. A short section of on-street parking is available on the north side of Mercer Street between Terry and Boren Avenues N.

Valley Street is a principal arterial with five lanes (two eastbound and three westbound) from Fairview Avenue N. to Westlake Avenue N., and serves as the westbound segment of the Mercer/Valley couplet. Vehicles exiting I-5 use Fairview Avenue N., Valley Street and Broad Street to access Seattle Center and surrounding neighborhoods such as Queen Anne, Ballard, Magnolia, the interbay manufacturing center and the north sections of downtown. Valley Street becomes a minor arterial west of Eighth Avenue N. A short half-block section of on-street parking is available on the south side of Valley Street, between Fairview Avenue N. and the alleyway just to the west.

Roy Street is classified as a minor arterial (between Dexter Avenue N. and Ninth Avenue N.) and a local street (between Dexter Avenue N. and Taylor Avenue N.). It is a one-way street between Ninth and Dexter Avenues for westbound traffic. Roy Street becomes a two-way street west of Dexter Avenue, and while it connects to SR-99 (Aurora Avenue N.), traffic cannot cross SR 99 on Roy Street.

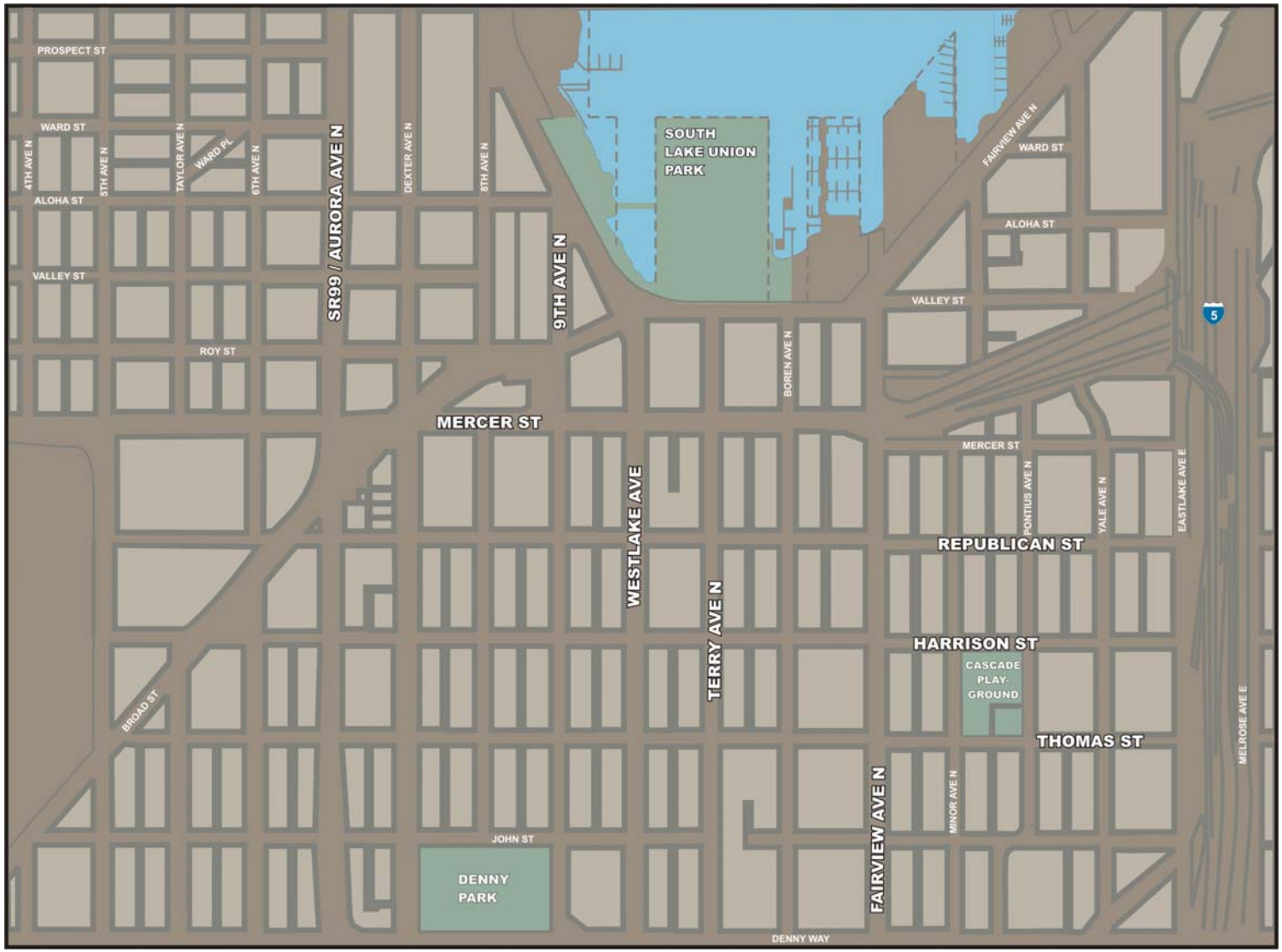

Figure 4.1: Study Area Map

Republican Street is a two-lane minor arterial with one lane in each direction. It is significant to the study area since it serves as an alternative route to Mercer Street as a connection to Eastlake Avenue N. and Capitol Hill, and also for local circulation within the study area. Traffic signals were recently installed at Ninth and Westlake Avenues, and this is an existing signal at Fairview Avenue N. On-street parking is available on both sides of the street within the study area. Republican Street currently does not provide access across SR 99/Aurora Avenue N.

Harrison Street is a two-lane local street with one lane in each direction. Similar to Republican Street, it also provides relief for Mercer Street by offering an alternative for local circulation in the SLU area. Signals exist along Harrison Street at Fairview Avenue N., Westlake Avenue N., Ninth Avenue N., and Dexter Avenue N. Parking exists on both sides of the street within the study area. Harrison Street also does not provide access across SR-99.

Thomas Street is a two-lane local street with one lane in each direction. It primarily serves local traffic and provides access to local businesses. With the exception of its intersection with Fairview Avenue N., no signals exist along Thomas Street within the study area. Parking is provided on both sides of the street from Dexter to Eastlake Avenues. The block of Thomas Street between Boren and Fairview Avenue N. is heavily used by trucks accessing the Seattle Times loading docks. Thomas Street does not provide access across Aurora Avenue N.

Denny Way, located at the southern edge of the study area, is a four-lane principal arterial with two lanes in each direction. It provides a key connection to/from the Capitol Hill neighborhood and the south side of the Seattle Center. To the east, this roadway also connects to southbound I-5 (via Yale Avenue) and the reversible express lane ramp. Signals exist at key cross streets such as Fairview Avenue, Westlake Avenue, Ninth Avenue, Dexter Avenue, Aurora Avenue N., Sixth Avenue N. and Fifth Avenue N.

North-South Roadways

Dexter Avenue N. is a four-lane minor arterial that provides connections for bicyclists (bike lanes), transit and autos from Fremont, Queen Anne and other adjacent neighborhoods to the north and downtown. Parking is provided on both sides of the street north of Denny Way and signals exist at its intersections with Denny Way, Harrison Street, Mercer Street and Roy Street. Dexter Avenue N. is a key north-south bus route.

Ninth Avenue N. is a principal arterial that forms one half of the one-way couplet with Westlake Avenue from Broad Street to Denny Way. It provides a southbound route to downtown and serves as one of the few major carriers of southbound traffic from the Westlake and Fremont neighborhoods (via Westlake Avenue). Parking is provided on one or both sides of the street along much of Ninth Avenue N.

Westlake Avenue N. is a principal arterial with four lanes of traffic heading northbound from Denny Avenue to Valley Street. It provides a directional connection from downtown to South Lake Union and north to the Westlake and Fremont areas, and forms the other half of the one-way couplet with Ninth Avenue. Westlake and Ninth Avenues are major truck streets north of Mercer. Parking exists on both sides of the street and signals are provided at key intersections. South of Denny Way and north of Ninth Avenue, Westlake Avenue operates as a two-way roadway.

Terry Avenue N. is a local access street from Denny Way to Mercer Street. Currently, Terry serves as a lower-volume access road for a variety of businesses and light-industrial uses. However, the Terry Avenue Street Design Guidelines, recently developed by SDOT, will help shape Terry Avenue in the near future to create a primary north-south pedestrian corridor and limited-volume local access street. In general, on-street parking is available on Terry Avenue between Valley Street and Denny Way.

Fairview Avenue N. is a principal arterial with two-lanes in each direction and left-turn lanes at most intersections. It serves as a major connector to/from the Eastlake and University District neighborhoods and SLU/downtown Seattle, and also serves key transit routes such as the King County Metro 70-series buses. At Mercer Street, Fairview Avenue provides access to/from the I-5 ramps and thus serves as a critical gateway for the north downtown areas. Off-peak, directional on-street parking is available along Fairview Avenue between Denny Way and Republican Street.

Eastlake Avenue is a principal arterial with two lanes in each direction and is the easterly boundary of the SLU Transportation Study. Eastlake primarily provides a connection between downtown and the Eastlake and University District neighborhoods, but also provides a peripheral connection to South Lake Union. Parking exists on the west side of the street within the SLU study area and signals exist at key intersections such as Mercer Street, Lakeview Boulevard, and Stewart Street.

Aurora Avenue N. (SR 99) is a limited access state highway dividing South Lake Union from Queen Anne and Seattle Center. It has three lanes in each direction and access to Aurora is provided by right turns only from east-west streets.

Broad Street is a principal arterial that is aligned at a 45 degree angle to the existing street grid between the intersections of Westlake and Valley to the Elliott Bay waterfront. Broad Street crosses under Mercer, Dexter, and Aurora Avenues creating an interruption to local circulation at it's portals on both sides of Aurora Avenue. Broad is also a major truck street connecting to the Mercer/Valley couplet.

Traffic Volumes

Peak-hour intersection turning movement volumes for existing conditions were taken from the City of Seattle traffic count database and/or by collecting traffic volume data in the field. The majority of traffic volumes for the core South Lake Union area between Valley Street and Harrison Street and between Dexter Avenue and Fairview Avenue were obtained from City of Seattle data. Volumes for several intersections near the Seattle Center were obtained from manual field counts. Key intersections targeted for the analysis are listed in Table 4.1.

Table 4.1: Key Study Intersections

Mercer Street & Westlake Avenue	Mercer Street & Dexter Avenue
Broad Street & Westlake Avenue	Harrison Street & Dexter Avenue
Mercer Street & Fairview Avenue	Mercer Street & 5th Avenue
Valley Street & Fairview Avenue	Roy Street & 5th Avenue
Fairview Avenue & I-5 Off-Ramp	Harrison Street & 5th Avenue
Harrison Street & Fairview Avenue	Harrison Street & Broad Street
5th Avenue & Broad Street	Mercer Street & Eastlake Avenue
Roy Street & 9th Avenue	Denny Way & Broad Street
Mercer Street & 9th Avenue	Republican Street & Fairview Avenue

With the exception of the manual field counts, most intersection volumes reflected year 2001 information for the AM peak period (7 to 9 AM) and PM peak period (4 to 6 PM). Based on 15-minute traffic count data, the single-highest volume peak hour for the AM peak period was estimated to occur from 7:15 AM to 8:15 AM, while 5 PM to 6 PM defined the PM peak hour. Included in the existing count data are heavy vehicle volumes at the targeted intersections as well as pedestrian volumes by movement. For some intersection locations, volume refinements were performed to ensure reasonable balancing between adjacent intersections, especially for closely spaced intersections. Figures 4.2 and 4.3 graphically show the existing turning movement volumes.

Mode Share Data

Mode split data for existing conditions is taken from year 2000 U.S. Census Bureau Journey-to-Work data (TAZ 107). Based on the census data, the current single-occupancy vehicle (SOV) share for work trips to the SLU area is approximately 71 percent. Transit trips represent about 11 percent of the mode share, carpools/vanpools represent about 13 percent, and walking/bicycling, or other modes represents about six percent of the work trips to the SLU area.

Table 4.2: Existing Mode Share in the South Lake Union Area for Work Trips

	Mode Share
SOVs	71%
Transit	11%
Carpool/Vanpool	13%
Walk/Bike	4%
Other	2%

Based on Year 2000 Census Data for Work Destinations(TAZ 107)

Traffic Operations

Operational analysis of existing AM and PM peak-hour conditions was performed for selected signalized intersections using the Synchro/SimTraffic analysis package, which uses the analysis methods given in the 2000 Highway Capacity Manual (HCM). The key measures used to describe current operational characteristics for the SLU area included

intersection delays or level-of-service (LOS), and travel time. Key assumptions used for the overall analysis are described in Table 4.3.

Capacity analysis, as it is commonly referred to, is used to determine level-of-service (LOS) for various transportation facilities such as intersections, freeways, and arterials, etc. Table 4.4 shows standardized LOS criteria and thresholds for signalized intersections.

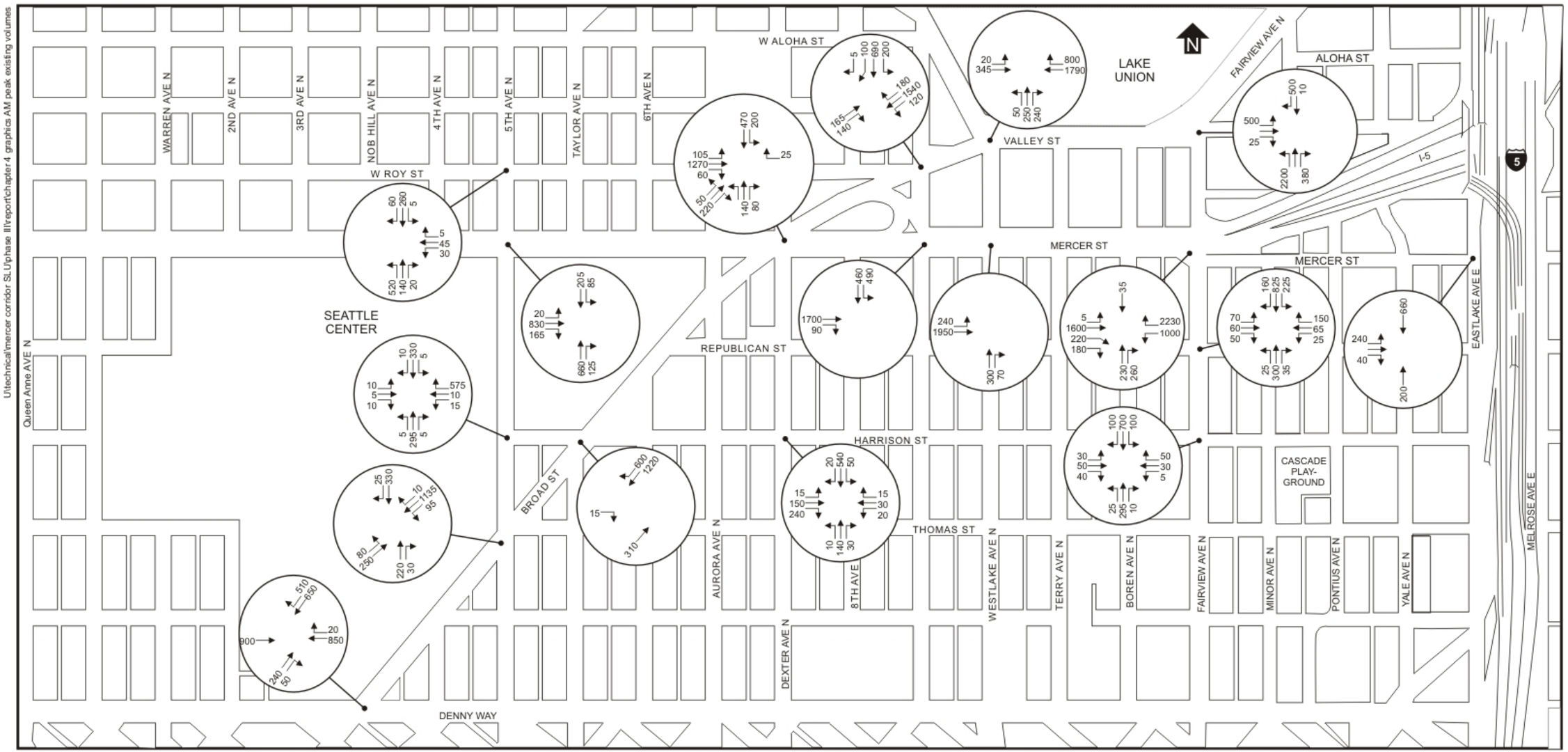

Figure 4.2: South Lake Union – Existing Conditions AM Peak Hour Intersection Volumes

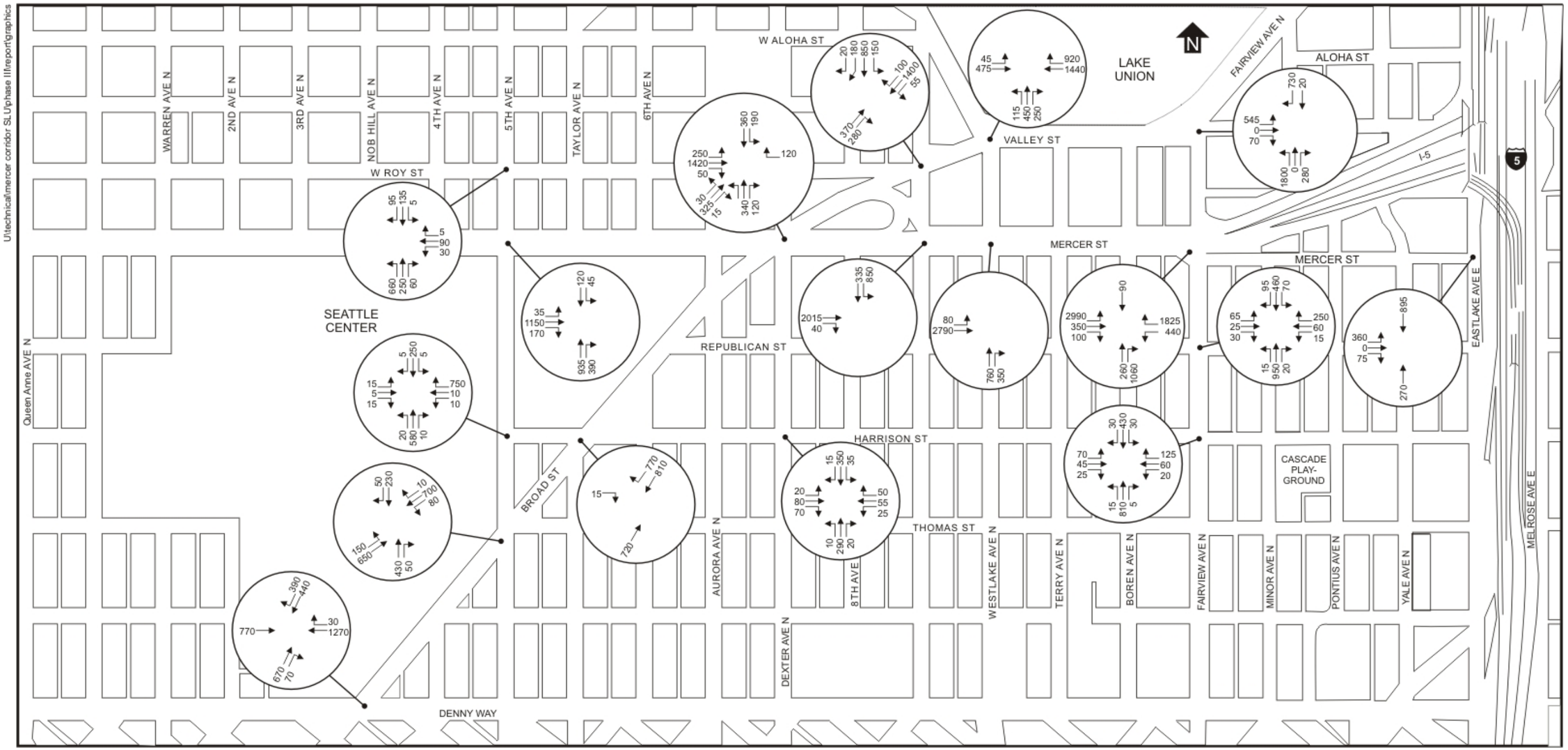

Figure 4.3: South Lake Union – Existing Conditions PM Peak Hour Intersection Volumes

Table 4.3: Analysis Assumptions

Assumption	Description
Lane Geometry	Existing lane geometry was used based on paint line sketches and field observations, including digital photos.
Traffic Data	Traffic volumes were taken from the City of Seattle count database and manual field counts where necessary (intersections near Seattle Center).
Driver Behavior	Driver behavior parameters used in the micro-simulation were similar to those used in previous SLU traffic evaluations which assume slightly more aggressive driver characteristics than a typical suburban environment.
Signal Timing Data	Signal input data for each intersection was taken from the City of Seattle signal timing database.
Transit Routes	Transit routes and service levels were coded in the simulation model based on current King County Metro schedules and route maps.
Pedestrians and Bicyclists	Non-motorized volumes used in the analysis were collected in the field for selected locations near the Seattle Center, and Mercer and Valley Streets between Fairview Avenue N. and Westlake Avenue N. Where this information was not available, program default values for crossing movements were assumed.

Table 4.4: Level of Service Criteria for Signalized Intersections

LOS	Average Intersection Signalized Delay (seconds/vehicle)	Traffic Flow Characteristics
A	≤ 10	Low delays, virtually free flow, unimpeded
B	> 10 and ≤ 20	Stable flow with minor delays, less freedom to maneuver through the intersection
C	> 20 and ≤ 35	Stable flow with some delays, less freedom to maneuver through the intersection
D	> 35 and ≤ 55	Long delays and high density but stable flow and operations
E	> 55 and ≤ 80	Operating conditions at or near capacity
F	> 80	Forced operation, breakdown conditions

Source: 2000 Highway Capacity Manual (Chapter 16)

Existing LOS analysis results for AM and PM peak hours are presented in Table 4.5. During the AM peak, the intersection of Mercer Street and Dexter Avenue N. operates at LOS D and Mercer Street and Fairview Avenue N. operates at LOS E. Four of the key selected intersections currently operate at LOS D while one (Mercer Street and Dexter Avenue N.) operates at LOS E during the PM peak. As one would expect, the most congested locations in the study network are mainly along Mercer Street due to the significant amount of traffic it carries during the critical peak periods. Mercer Street serves as the primary "feeder" to the I-5 corridor from the SLU study area, with access to the I-5 ramps occurring at the Mercer Street/Fairview Avenue N. intersection. Results for the remaining intersections indicate modest to moderate delays in the LOS A to LOS C range during both the AM and PM peak.

Table 4.5: AM and PM Peak Hour Delay and LOS Summary (Existing Conditions at Selected Intersections)

			AM		PM	
ID	**Cross Street 1**	**Cross Street 2**	**Delay**	**LOS**	**Delay**	**LOS**
9	Mercer Street	Westlake Avenue	29.8	C	37.3	D
10	Broad Street	Westlake Avenue	12.0	B	13.7	B
14	Mercer Street	Fairview Avenue	56.6	E	48.3	D
17	Valley Street	Fairview Avenue	21.4	C	21.5	C
18	Fairview Avenue	I-5 Off-Ramp	4.9	A	9.5	A
27	Harrison Street	Fairview Avenue	9.1	A	10.1	B
28	5th Avenue	Broad Street	22.1	C	26.8	C
31	Roy Street	9th Avenue	28.3	C	50.0	D
32	Mercer Street	9th Avenue	17.8	B	38.1	D
36	Mercer Street	Dexter Avenue	38.8	D	80.0	E
39	Harrison Street	Dexter Avenue	26.9	C	9.7	A
57	Mercer Street	5th Avenue	23.4	C	25.1	C
58	Roy Street	5th Avenue	33.9	C	14.8	B
62	Harrison Street	5th Avenue	8.6	A	10.8	B
63	Harrison Street	Broad Street	6.8	A	20.3	C
65	Mercer Street	Eastlake Avenue	9.8	A	19.0	B
66	Denny Way	Broad Street	14.2	B	20.3	C
203	Republican Street	Fairview Avenue	15.1	B	19.0	B
Total Network Average Delay (sec/veh)			226.3		223.2	

Note: Total Network Average Delay is a weighted average delay per vehicle for all intersections in the study area (beyond those listed in the table).

Another measure that was used to assess traffic operations was travel times for selected point-to-point routes within the study area. Travel times were calculated through a

combination of an assumed operating speed of 25 mph for vehicles between intersections and calculated approach delays at signalized intersections along the specific paths.

Table 4.6 summarizes the estimated AM and PM peak-hour travel times for several key east-west and north-south routes within the study area under current conditions. During the PM peak the highest travel times are experienced in the eastbound direction. During the AM peak, the travel times are moderate with the highest travel times along the east-west path between I-5 and the north side of the Seattle Center. Also shown in Table 4.6 is the estimated delay experienced by traffic on the off-ramps from I-5 as they approach Fairview Avenue N. Currently, the average delay for this approach is slightly higher in the AM peak hour as compared to the PM peak hour.

Figures 4.4 through 4.7 show the actual travel paths and their associated travel times for east/west and north/south routes, and AM and PM peak hours, respectively.

Table 4.6: Existing AM and PM Peak Hour Travel Times

Path ID	East-West Routes	AM Travel Time	PM Travel Time
1	WB – I-5 to North Side Seattle Center	7.0 min	6.4 min
2	EB – North Side Seattle Center to I-5	6.8 min	8.4 min
3	WB – I-5 to South Side Seattle Center	5.3 min	5.5 min
4	EB – South Side Seattle Center to I-5	6.1 min	10.4 min
5	WB – Eastlake to North Side Seattle Center	5.4 min	4.9 min
6	EB – North Side Seattle Center to Eastlake	4.7 min	6.0 min
7	WB – I-5 to Westlake/Aloha	3.3 min	3.2 min
8	EB – Westlake/Aloha to I-5	5.7 min	8.1 min
Path ID	**North-South Routes**	**AM Travel Time**	**PM Travel Time**
1	NB – Fairview Avenue	3.5 min	4.6 min
2	SB – Fairview Avenue	6.9 min	9.2 min
3	NB – Westlake Avenue	4.6 min	4.8 min
3a	SB – Westlake Avenue		
4	SB – 9th Avenue	5.7 min	8.0 min
4a	NB – 9th Avenue		
5	NB – Dexter Avenue	3.0 min	3.0 min
6	SB – Dexter Avenue	5.2 min	4.7 min
7	WB – Eastlake Ave to South Side Seattle Center	3.7 min	4.0 min
8	EB – South Side Seattle Center to Eastlake Avenue	3.4 min	5.6 min
Ramp Queue Delay at I-5 & Fairview (WB)		1.5 min	1.3 min

Accident History

The City of Seattle provided existing accident data for high collision intersections within the city limits. Figure 4.8 displays the year 2002 high accident intersections in the project area. As seen in the figure, there are nine unsignalized intersections and three signalized intersections in the

project area with a high number of collisions. Identifying these intersections supported the analysis of the existing "problem areas", which are discussed in the following sections.

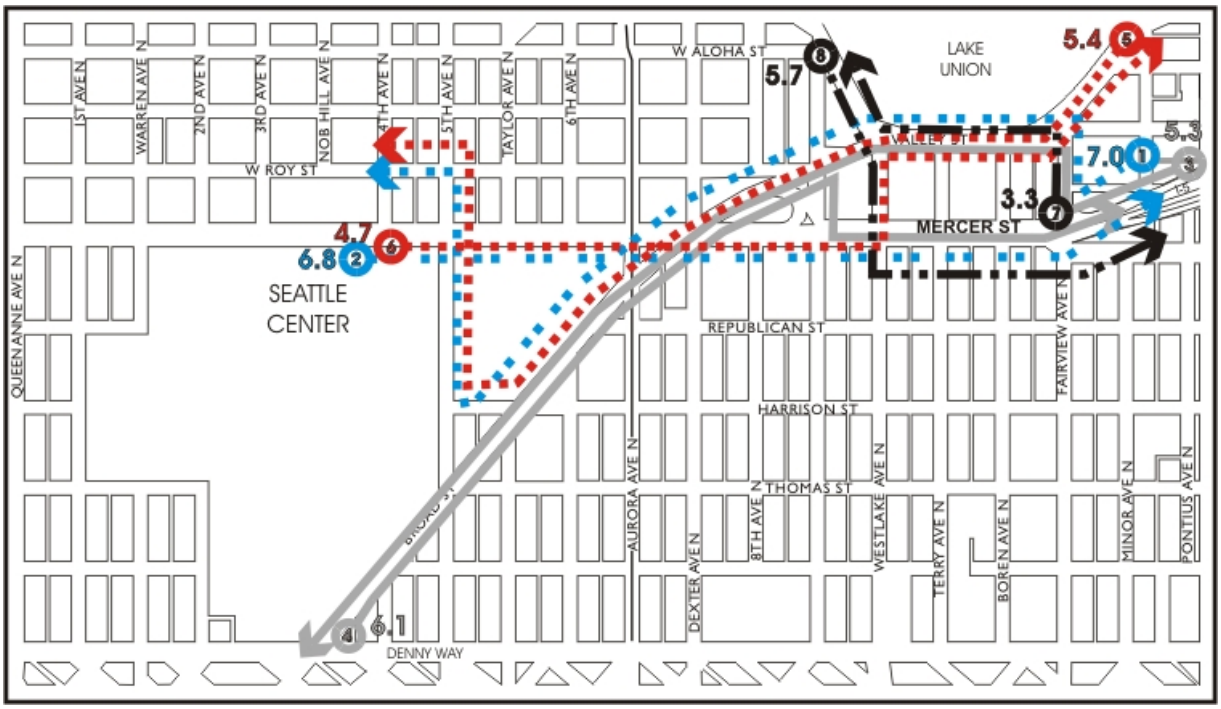

Figure 4.4: Existing East/West AM Peak Travel Time Path Summaries

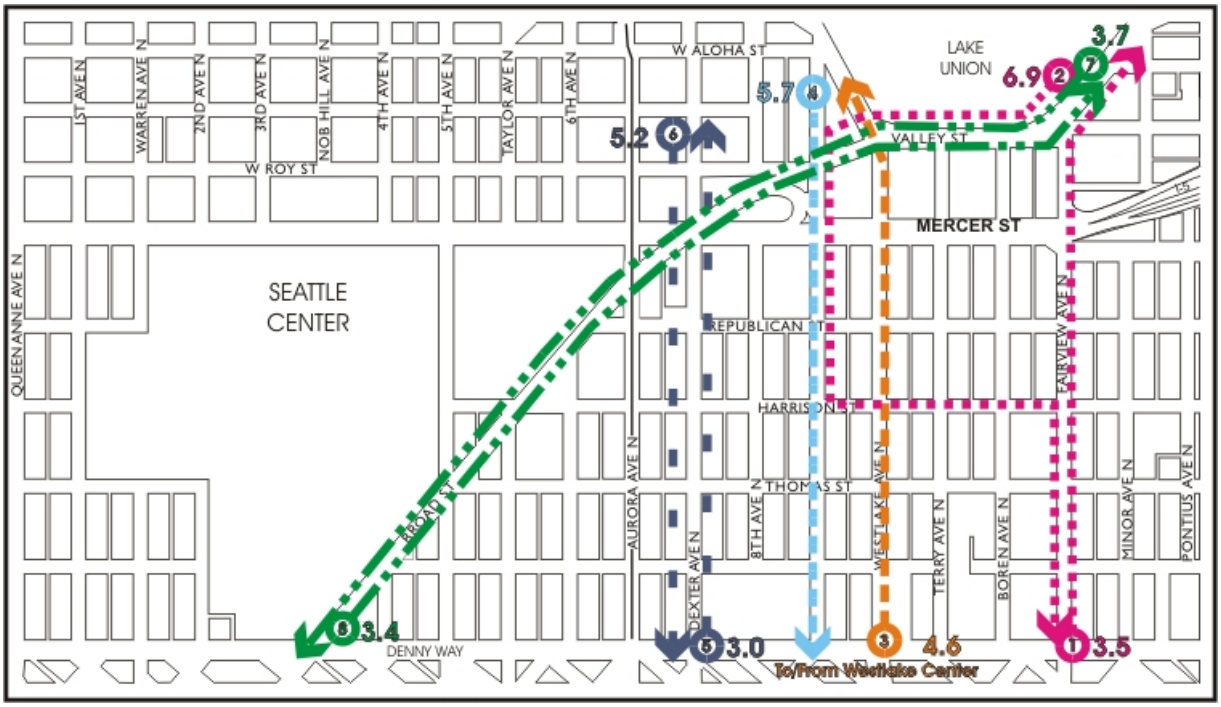

Figure 4.5: Existing North/South AM Peak Travel Time Path Summaries

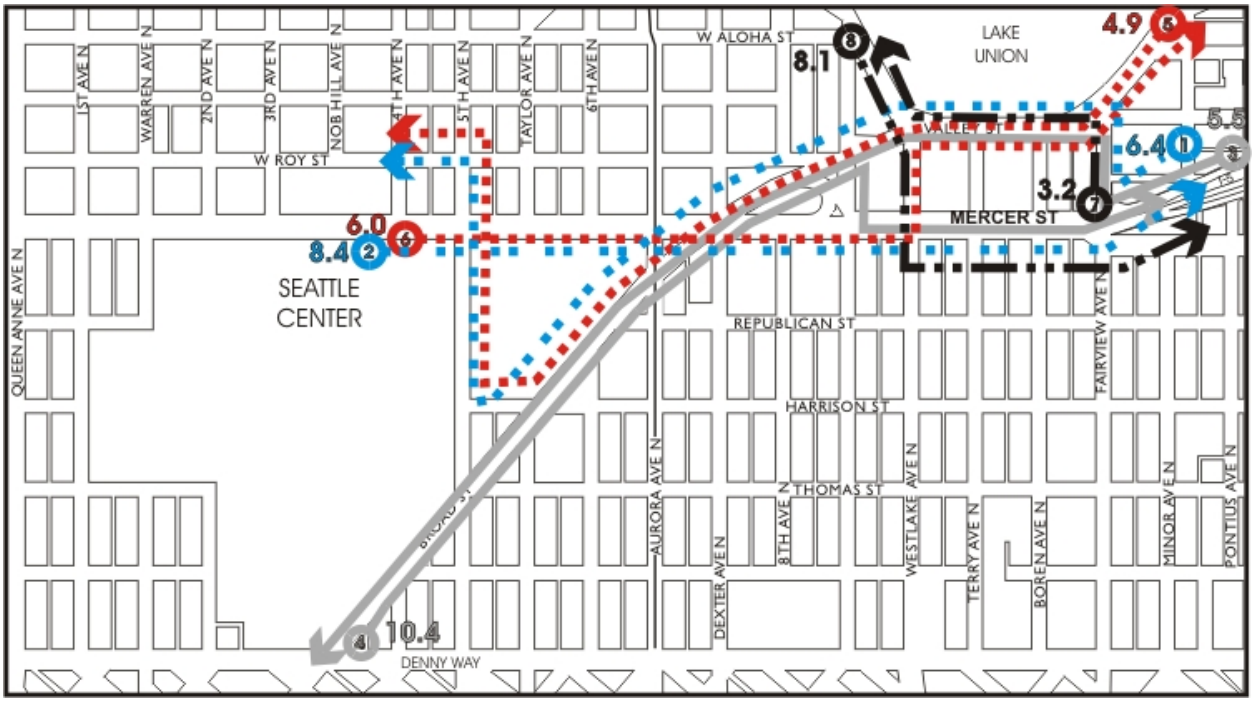

Figure 4.6: Existing East/West PM Peak Travel Time Path Summaries

Figure 4.7: Existing North/South PM Peak Travel Time Path Summaries

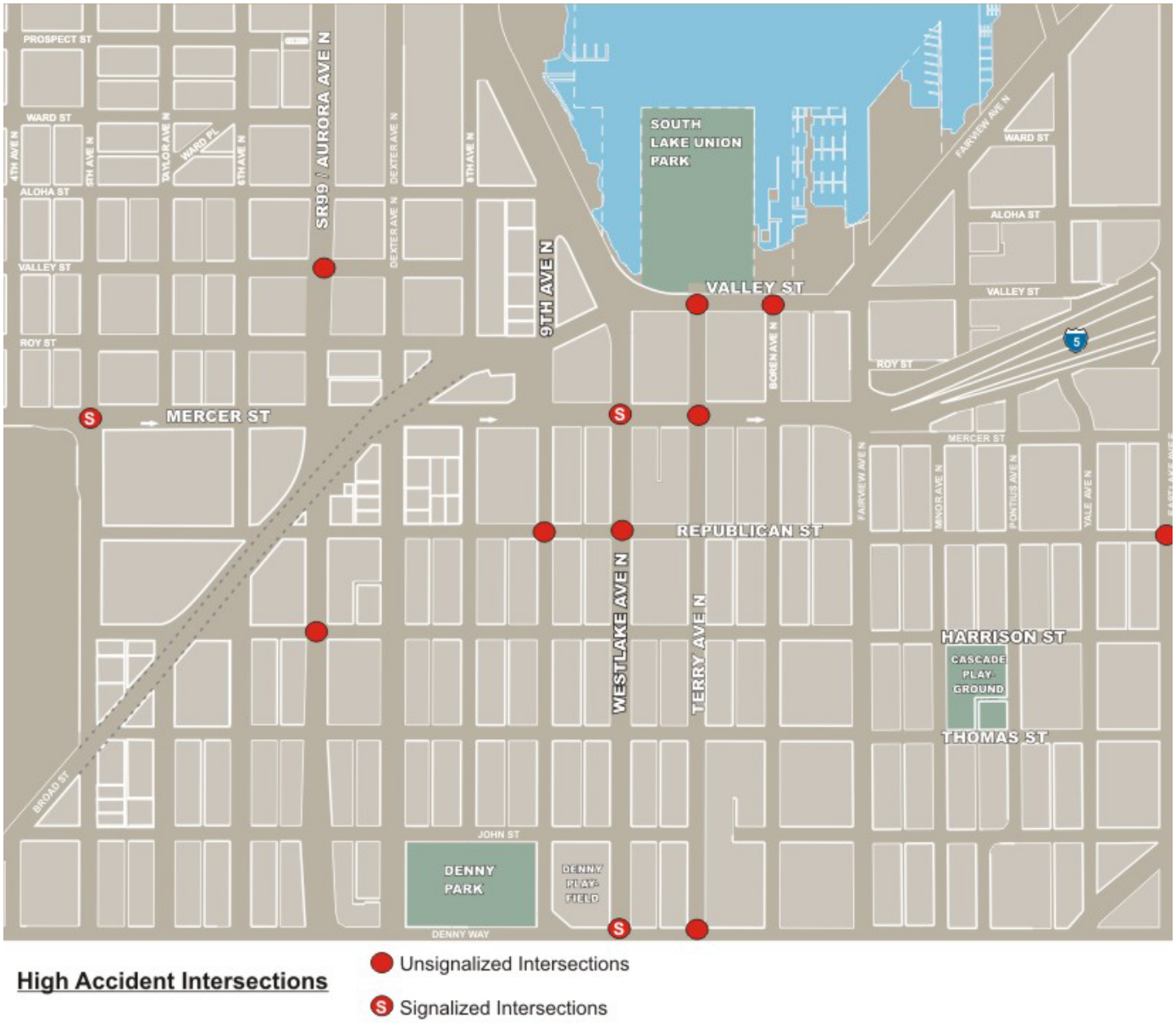

Figure 4.8: 2002 High Accident Locations

Valley Street Origin-Destination Survey

The South Lake Union Transportation Study included an origin and destination study that focused on users of Valley Street between Fairview Avenue N. and Westlake Avenue N. A traffic count/vehicle following study was conducted to better understand both general-purpose traffic and truck travel patterns through the Mercer Corridor area with special attention to the "around-the-lake" movement using Valley Street.

This analysis was undertaken to help the project team determine if narrowing Valley Street was a feasible option, provided the heavy westbound traffic volume from I-5 could be accommodated in other ways, such as by a widened, two-way Mercer Street configuration. The intent was to determine approximately how many vehicles (autos and trucks) currently use Valley Street to travel westbound and eastbound around the south end of Lake Union. The study team could then determine how many vehicles would continue to use Valley Street to make the around-the-lake movement and how many vehicles are actually using Valley Street to access Broad Street to continue traveling east or Mercer Street to travel eastbound and access the I-5 ramps and other locations.

The count team used the upper floor café of the Shurgard building to view westbound vehicle and truck traffic movements. They also made ground level observations at the Ninth Avenue N. /Valley Street intersection for eastbound movements. Traffic movements both from the Eastlake neighborhood (westbound around-the-lake movements) and from the Westlake area (eastbound around-the-lake movements) were quantified and documented. Data collection efforts for this effort were conducted on December 9th, 2003 and counts during the morning (7 to 9 am), mid-day (9:30 to 11:30 am), and evening (4 to 6 pm) were compiled.

General Purpose Traffic

Data indicates that total traffic making the westbound "around-the-lake" movement varied from between 21 to 26 percent of all southbound Fairview Avenue N. traffic approaching Valley Street. Approximately 500 vehicles during the PM peak hour currently arrive at the southbound intersection approach. Of these vehicles, approximately 480 are autos. Of the 480 autos, approximately 21 percent are using Valley Street to access northbound Westlake Avenue and complete a westbound "around-the-lake" movement. This represents a total of 100 vehicles making this movement in the morning peak period. During the evening peak period approximately 720 autos are in the southbound Fairview Avenue N. traffic stream that will turn right onto Valley Street (continuing south on Fairview Avenue N. past Valley Street is currently prohibited for all traffic except transit). Approximately 26 percent of this traffic is estimated to make the "around-the-lake" movement, representing a total of 190 vehicles during the evening peak.

In the eastbound direction, tracking each vehicle's movement after it left the intersection of Valley Street and Ninth Avenue was difficult. However, the study team observed that most traffic turning left at this intersection to access Valley Street would continue to travel eastbound and then northbound on Fairview Avenue N., making the "around-the-lake" movement. Based on observed traffic counts at the Valley Street and Fairview Avenue N.

intersection, the study team assumed a conservative estimate for auto traffic making the eastbound "around-the-lake" movement to be 90 percent of the total number turning left onto Valley Street from southbound Westlake Avenue N.

In the morning peak, approximately 185 autos (non-heavy vehicles) currently arrive at the southbound approach and turn left onto Broad/Valley Streets. Of the 185 vehicles, 90 percent (165) are expected to continue traveling eastbound to Fairview Avenue N. and make the "around-the-lake" movement. Results for the evening peak were similar, with 155 autos turning left, and 140 (90 percent) of those assumed to make the eastbound around-the-lake movement.

Figure 4.9 diagrams and quantifies the results of the Valley Street origin-destination study for both AM and PM peak hours, and for total traffic as well as trucks. The results indicate that the level of "around-the-lake" traffic currently using Valley Street ranges between 100 and 200 vehicles in each direction for both the AM and PM peak hours. Of these vehicles, fewer than ten in each direction are trucks. This information was used to assess the adequacy of proposed improvements to Mercer, Valley, and Boren Streets, which are discussed in Chapter 8.

Heavy-Vehicle Traffic

The survey found that the total number of truck movements was highest during the mid-day time period (9:30 AM to 11:30 AM), followed by the morning peak, and finally by the evening peak for either eastbound or westbound travel. Results of the survey also showed that the majority of truck traffic did not use Valley Street for eastbound movements, but rather used Mercer Street (presumably to access I-5 east of Fairview Avenue). This pattern was increasingly observed as the day progressed, with trucks using Valley Street eastbound decreasing from approximately nine trucks in the morning peak to five trucks during the mid-day peak, and further decreasing to three trucks during the evening peak.

Westbound truck traffic varied more noticeably. Based on the survey findings, approximately one-quarter of all truck traffic traveling westbound on Valley Street continues around the south end of Lake Union and then onto Westlake Avenue to points north during the morning and mid-day time periods. The number of westbound trucks traveling north onto Westlake Avenue decreases considerably during the evening peak period to approximately 6 percent of total truck traffic. In actual numbers, the total truck traffic heading westbound around the lake is estimated at approximately eight trucks during the morning peak and one truck in the evening peak.

Conclusion

Based on the findings of the Valley Street origin-destination survey for auto and truck traffic, it does not appear that on the proposed two-lane design for Valley Street will impede auto or truck traffic using Valley Street to make around-the-lake movements.

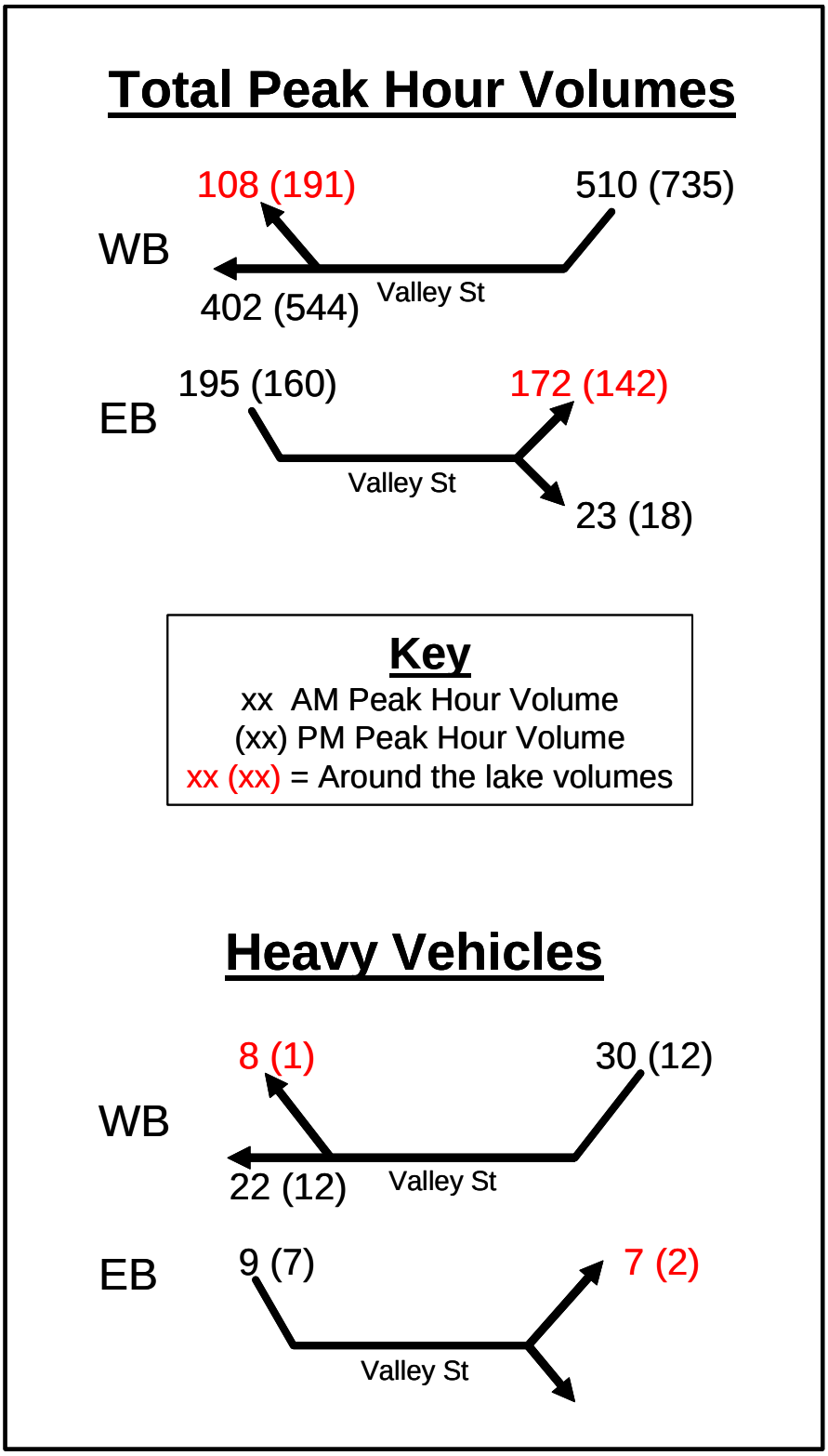

Figure 4.9: Valley Street Traffic Pattern Study Results

Transit Service

Due to a number of factors (limited bus service, relatively inexpensive and plentiful parking, etc.) the great majority of employees commute to the South Lake Union by automobile. Year 2000 census data indicates an 11-percent transit mode share for work trips to the SLU area, while 71 percent drove alone.

Commute Trip Reduction survey data for the year 2003 indicates a higher share of work trips by transit or about 14 percent.[1] The transit mode share is likely higher for the survey data because it only includes major employers. Many of these major employers have implemented Transportation Demand Management programs that have helped to increase the transit mode share.

Existing Service Levels

Existing bus routes are shown in Figure 4.10. Seventeen bus routes serve the South Lake Union Area, including the area between Aurora Avenue North and Fifth Avenue North. However, as shown in Figure 4.10, because SLU covers a wide area, buses that serve one end of the SLU area may not be useful for those who work in a different area of SLU. For example, most people who work near Fairview Avenue would be unwilling to walk seven (7) blocks to Aurora Avenue N. to catch a bus. There is no east-west transit service north of Denny. Furthermore, a number of these routes only serve the SLU neighborhood during off-peak hours, therefore limiting their ability to adequately serve employees or residents of SLU. The routes which serve the core area of SLU include Route 70 along Fairview Avenue N., and the associated 70 series (71, 72, and 73), which provide the same service after 7:00 pm; Route 17 along Westlake (northbound) and Ninth (southbound) Avenues, and Routes 26 and 28, along Dexter Avenue N. All other routes described below in Table 4.7 primarily serve the periphery of the SLU area.

Descriptions of the following bus routes follow: routes that serve during peak hours, routes that make only limited stops in the SLU area during peak hours, and those that only serve the SLU area during off-peak hours.

Routes that Make Regular Stops During Peak Hours in SLU Area

Route 3 services Madrona, Central District, First Hill, Downtown Seattle, Belltown, Seattle Center East, and North Queen Anne. This route operates seven days a week and has weekday peak-hour headways of 15 minutes.

Route 4 provides service to and from North Queen Anne. Route 4 services Judkins Park, Central District, First Hill, Downtown Seattle, Belltown, Seattle Center East, and East Queen Anne. This route operates seven days a week and has weekday peak-hour headways of 15 minutes.

[1] Based on King County Metro Lake Union/Queen Anne weighted survey data for Potential, 1 Year, 2 Year, and 3+ Year AFP Customers.

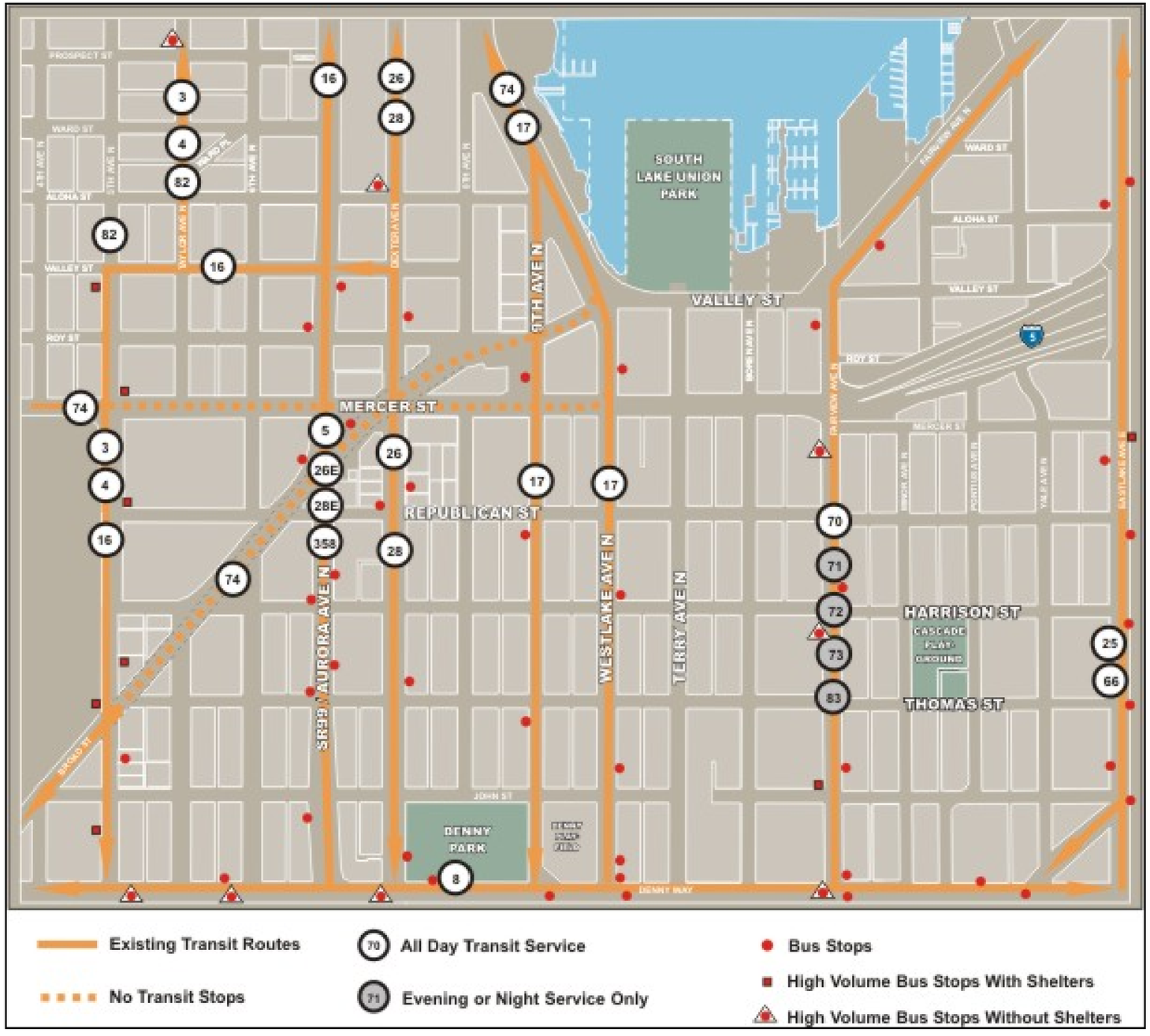

Figure 4.10: Existing Transit Routes and Facilities

Table 4.7: Existing Transit Service by Area

Route	Peak Headway (Minutes)	Seattle Center	Aurora Avenue	Westlake	Fairview	Eastlake	Denny Way
Route 3	15	X					
Route 4	15	X					
Route 5	30		(L)				
Route 8	30						X
Route 16	20	X					
Route 17	10			X			
Route 25	30					X	
Route 26	10		X				
Route 28	15		X				
Route 66	20					X	
Route 70	15				X		
Route 71	30				(X)		
Route 72	30				(X)		
Route 73	30				(X)		
Route 74	30	X		X			
Route 83	N/A				(X)		
Route 358	7		(L)				

(X) Indicates off-peak service only

(L) Indicates limited stops in SLU area

Route 8 travels east-west along Denny Way through the study area and services Rainier Valley, Capitol Hill, Group Health Hospital, the Seattle Center, and Lower Queen Anne. This route operates seven days a week and has peak-hour headways of 30 minutes.

Route 16 services the Coleman Dock-Ferry Terminal, Downtown Seattle, the Seattle Center, Wallingford, East Green Lake, North Seattle Community College, the Northgate Mall, and the Northgate Transit Center. This route operates seven days a week and has peak-hour headways of 20 minutes.

Route 17 services Downtown Seattle, Westlake, Seattle Pacific University, Ballard, Sunset Hill, and Loyal Heights. This route operates seven days a week and has peak-hour headways of 10 minutes.

Route 25 services Downtown Seattle, Eastlake, Montlake, the University District, Children's Hospital, and Laurelhurst. This route operates weekdays with 30 minute headways during peak hours.

Route 26 services Downtown Seattle, Dexter Avenue N., Fremont, Wallingford, Latona Avenue NE, and East Green Lake. In the South Lake Union area, this route follows along Dexter Avenue. This route operates seven days a week and has peak-hour headways of ten minutes.

Route 28 services Downtown Seattle, Dexter Avenue N., Fremont Avenue, Ballard, Whittier Heights, and Broadview. This route operates seven days a week and has peak-hour headways of 15 minutes.

Route 66 services Coleman Dock-Ferry Terminal, Downtown Seattle, Eastlake (limited stops), University District, Maple Leaf, Northgate Transit Center, Northgate Mall, and Northgate Park and Ride. This route operates seven days a week and has peak-hour headways of 20 minutes.

Route 70 services Downtown Seattle, Fairview Avenue N., Eastlake, and the University District. This route operates six days a week and has peak-hour headways of 15 minutes.

Route 74 services Downtown Seattle, Queen Anne, Fremont, Wallingford, the University District, Ravenna, and Sand Point. This route operates seven days a week and has peak-hour headways of 30 minutes.

Routes that Make Limited Stops During Peak Hours in SLU Area

Route 5 services Downtown Seattle, Queen Anne, Fremont, Greenwood and Shoreline with a peak-hour headway of about 30 minutes. It makes limited stops in the SLU area.

Route 358 services Downtown Seattle, Seattle Center (limited stops), Bitter Lake and Shoreline. Peak-hour headways are about every 7 minutes.

Routes that Serve SLU Only During Off-Peak Hours

Route 71 services Downtown Seattle (Tunnel), Eastlake, University District, Ravenna, View Ridge, and Wedgwood. This route operates seven days a week and has peak-hour headways of 30 minutes. During peak hours it is an express route between the University District and downtown Seattle and either does not travel through or does not make stops in the South Lake Union neighborhood.

Route 72 services Downtown Seattle (Tunnel), Eastlake, University District, Maple Leaf, and Lake City. This route operates seven days a week and has peak-hour headways of 30 minutes. During peak hours it is an express route between the University District and downtown Seattle and either does not travel through or does not make stops in the South Lake Union neighborhood.

Route 73 services Downtown Seattle (Tunnel), Eastlake, University District, Green Lake Park and Ride, Maple Leaf, and Jackson Park. This route operates seven days a week and has peak-hour headways of 30 minutes. During peak hours it is an express route between the University District and downtown Seattle and either does not travel through or does not make stops in the South Lake Union neighborhood.

Route 83 offers weekday night owl service serving Downtown Seattle, Fairview Avenue, Eastlake Avenue, University District, and Ravenna. Two night owl runs occur each night.

Shelters

According to King County Metro, a bus stop is generally eligible for a shelter if it has more than 50 people boarding each day. King County Metro provided year 2003 daily boarding

data at each bus stop within the South Lake Union area. [2] Table 4.8 shows the locations of the bus stops having greater than 40 boardings per day in the South Lake Union area, and indicates whether or not bus shelters are provided at these bus stops. While the threshold for providing a shelter is 50 boardings, stops with 40 to 50 boardings per day are also identified here to highlight stops that may reach the 50 boardings threshold in the near future. This table identifies 18 stops with more than 50 boardings per day, and four bus stops having daily boardings between 40 and 50 persons.

Table 4.8: Heavy Use Bus Stops in the South Lake Union Area and Shelters

Route(s)	Direction	On Street	Cross Street	Daily Boardings	Bus Shelter
3, 4, 16	N	5th Avenue N	Broad Street (Thomas)	99	**Yes**
3, 4, 16	S	5th Avenue N	Broad Street (Thomas)	254	**Yes**
3, 4, 16	S	5th Avenue N	Valley Street	160	**Yes**
3, 4, 16	S	5th Avenue N	John Street	95	**Yes**
3, 4, 16	S	5th Avenue N	Mercer Street	88	**Yes**
3, 4, 16	N	5th Avenue N	Republican Street	78	**Yes**
5, 26E, 28E, 358	N	Aurora Avenue N	Mercer Street	94	**Yes**
5, 26, 28	N	Dexter Avenue N	Denny Way	247	**Yes**
25, 66, 74E	S	Eastlake Avenue E	Mercer Street	42	**Yes**
70, 71, 72, 73	S	Fairview Avenue N	John Street	88	**Yes**
3, 4	S	5th Avenue N	Cedar Street	191	**No**
3, 4, 16	N	5th Avenue N	Denny Way	41	**No**
8	E	Denny Way	Stewart Street	100	**In Design/ Construction**
8	E	Denny Way	Cedar Street (5th Avenue)	83	**No**
8	E	Denny Way	Dexter Avenue	75	**In Design/ Construction**
8	E	Denny Way	6th Avenue	71	**No**
8	E	Denny Way	Fairview Avenue	53	**No**
8	W	Denny Way	Pontius Avenue N	43	**In Design/ Construction**
26, 28	S	Dexter Avenue N	Aloha Street	51	**No**
70, 71, 72, 73	S	Fairview Avenue N	Harrison Street	82	**No**
70, 71, 72, 73	S	Fairview Avenue N	Mercer Street	54	**No**
3, 4	S	Taylor Avenue N	Prospect Street	49	**No**

[2] Daily Boardings from King County Metro data tabulated by Randy Young and Tom Noguchi in a memo with subject heading "Existing Transit Deficiencies" to Mike Podowski at the City of Seattle, dated January 8, 2004.

As shown in Table 4.8, ten bus stops that either meet or nearly meet the 50 boardings threshold for a bus stop shelter currently do have shelters, while twelve do not (although three are in design and construction). Recommendations regarding future bus stop shelter improvements are provided in Chapter 7.

Pedestrian Network

The SLU neighborhood has sidewalks along most blocks. However, along Mercer and Valley Streets the sidewalks are in disrepair and the streetscape is not appealing or comfortable for pedestrians. Significant barriers to pedestrian travel include Aurora, Broad, Mercer and Valley Streets.

Figures 4.11 and 4.12 show the condition of the sidewalks along Mercer and Valley Streets, as well as the overall street environment. As can be seen in these photos, although facilities are available for pedestrians, the disrepair of the sidewalks and the overall streetscape is neither inviting nor comfortable.

Figure 4.11 Existing Pedestrian Pathway on the North Side of Valley Street

Mercer and Valley Streets both have high traffic volumes and limited traffic-controlled crossings for pedestrians, making it difficult to get to South Lake Union Park and the waterfront from the rest of the neighborhood. There are no traffic signals on either Valley or Mercer, between Westlake and Fairview Avenues, so pedestrians must travel an extra block or two to cross the street safely. In addition, pedestrian crossings at the intersection of Fairview and Valley are not allowed on the west (Valley) approach.

Table 4.9 shows the locations where there are either no sidewalks or very limited/intermittent sidewalk facilities in the SLU neighborhood. In addition to Mercer and Valley, sections of Harrison Street and Terry Avenue have inadequate sidewalks.

Table 4.9: South Lake Union Streets with Limited or No Sidewalks

Street	From - Cross Street	To - Cross Street
East/West Streets		
Valley Street	Westlake Avenue	Terry Avenue
Mercer Street	Westlake Avenue	Fairview Avenue
Harrison Street	Terry Avenue	Westlake Avenue
North/South Streets		
Terry Avenue	Valley Street	Denny Way

Figure 4.12 Existing Sidewalk Facilities on Mercer Street

There is a pedestrian path around the south end of Lake Union along Westlake, Fairview, and to a limited extent Valley Street. However, the path is not signed and appears to wind through private property, which likely discourages some users. Additionally, the path is made up of differing facility types (sidewalks, asphalt path next to roadway, crushed gravel pathway, and wooden boardwalks) which does not provide continuity and may cause some confusion to users as to whether the path continues or not.

South of Mercer Street, pedestrian travel within the neighborhood is relatively easy and direct. There are some differences in grade, particularly between Boren and Minor. Most of

the sidewalks in this area are in reasonable condition. Generally, blocks that have been recently redeveloped have adequate and pleasant sidewalks and pedestrian areas.

Figure 4.14 Existing Sidewalk Facilities on Ninth Avenue

Figure 4.15 Existing Sidewalk Facilities on Ninth Avenue

However, options for traveling east beyond Eastlake Avenue E. or west past Aurora Avenue are rather limited. Interstate 5 presents a major barrier to all travel, not just pedestrian travel, and crossings of I-5 are limited to Denny Way and Lakeview Boulevard from the SLU study area. Both the Denny Way and the Lakeview Boulevard routes are rather steep and sidewalks on these streets are not generous. The Denny Way crossing of I-5 has a sidewalk only on the south side of the roadway, furthering the inconvenience for pedestrians traveling east across I-5. While the Lakeview Boulevard crossing has sidewalks on both sides of the roadway, it is a long curving bridge that leads to a narrow and steep roadway east of I-5, making it a relatively intimidating route for pedestrians or bicyclists traveling between SLU and Capitol Hill.

To the west, Aurora Avenue and Broad Street present a major barrier, again to all travel, but especially pedestrian and bicycle travel. Other than Denny Way at the southern end of the study area, there are only two locations for pedestrians to cross Aurora Avenue, and both are inconvenient and sub-standard. There is a five-block gap between Denny and Mercer, requiring significant out-of-the-way travel by pedestrians. The Mercer Street underpass has very narrow sidewalks with no handrails or other safety measures (other than the curb height) to improve the comfort level of pedestrians using the underpass. The Broad Street underpass is also located in the northern portion of the neighborhood and like Mercer has relatively narrow sidewalks on both sides of the roadway, again without handrails. The crossing distance for Broad Street is relatively long, with blank walls.

Bicycle Network

The bicycle lanes on Dexter Avenue are the only on-street bicycle facilities in the SLU neighborhood. They are located on the west side of the neighborhood and serve as a connector route from Fremont and points north to Downtown. While cyclists are able to access the multi-use/pedestrian path around Lake Union, it is not a commuter or fast cyclist facility.

Cyclists also use Eastlake, Fairview, Ninth and Westlake as north/south routes. Commuters from Eastlake and areas in northeast Seattle typically use Eastlake Avenue to commute to Downtown. Traffic conditions in the Mercer/Valley corridor make access to Fairview, Westlake and Ninth Avenues difficult for bicyclists, especially on Fairview Avenue at the I-5 ramps.

There are no designated bicycle facilities for east/west travel in SLU. Cyclists commonly use Harrison for east/west travel and to access the Dexter Avenue bike lanes. Non-arterial streets, such as Harrison, are not typically striped for bicycle lanes or other traffic control. Cyclists face the same difficulty as pedestrians when trying to cross Aurora Avenue – limited and inadequate facilities. Cyclists can cross Aurora at Mercer or Broad Streets, however most are likely to feel rather vulnerable or inconvenienced when using these facilities, because they are either in the travel lane with high volumes of traffic at relatively high speeds; or they are sharing a narrow, raised sidewalk with pedestrians immediately next to a travel lane.

Cyclists can use the multi-use pedestrian path/sidewalks around Lake Union, but in general this is a better recreational facility. The multi-use path isn't a viable option for fast or advanced cyclists because of the mix of pavement type and condition and the difference in speed between walkers and cyclists.

Parking

As shown in Table 4.10, a considerable amount of parking is provided in the SLU Area. This includes over 10,000 off-street parking spaces either in garages or surface lots, and approximately 3,600 on-street parking spaces. Much of the on-street parking is free and some is unregulated.

The City of Seattle's Comprehensive Neighborhood Parking Study indicates a very high utilization of on-street parking spaces, about 96 percent as shown in Table 4.10. Of the on-street parking, sample data indicates that about 71 percent of on-street parking is unrestricted, 24 percent is restricted to two-hour parking, and five percent is restricted to one-hour parking.

Table 4.10: Estimated Existing Parking Supply in the SLU Area and Utilization

		Parking Utilization (Based on Sample Study)		
Parking Type	**Total Estimated Supply**	**Sample Supply**	**Sample Demand**	**Demand to Supply Ratio**
Off Street	10,681	2251	1,554	0.69
On Street	3,600	763	735	0.96

The City of Seattle recently installed parking pay stations in the Chandler's Cove area of South Lake Union. As the area grows additional pay station for on-street parking may be considered, along with other time restrictions.

Transportation Demand Management (TDM)

The term transportation demand management (TDM) often refers to programs that encourage people to use alternatives to single occupant vehicle trips. Programs such as carpool ride-matching services, bus pass sales and distribution programs, and parking cash-out are often the types of activities associated with TDM. However, TDM is also a much broader approach to meeting transportation needs and as such it examines the physical and operational characteristics of a given transportation environment, and identifies and implements changes to the physical environment that facilitate the use of non-SOV modes. Thus while some TDM programs are called out individually in this document, it is also important to note that all the existing conditions in the neighborhood affect the ability to manage its transportation demand.

The pedestrian environment, in particular, is a key factor affecting mode choice—poor walking conditions, for example discourage both walk trips and transit trips. Pleasant and safe walking environments extend the distances people are willing to walk to reach transit.

Similarly, providing bicycle lanes and marked routes encourages bicycling in ways that educational and promotional TDM programs cannot. Adjusting transit service to fit changing needs (frequency, proximity, and usefulness of service) is also an essential part of managing transportation demand.

Existing TDM Programs in the SLU Area

There are number current TDM efforts ongoing in South Lake Union which focus on promoting non-SOV trips but work with the existing physical conditions as a given. Commute Trip Reduction programs are the most notable among these. The Washington State Legislature passed the CTR Law in 1991, incorporating it into the Washington Clean Air Act. The goals of the program are to reduce traffic congestion, reduce air pollution, and petroleum consumption through employer-based programs that decrease the number of commute trips made by people driving alone. King County Metro has been working with current and future major employers in the South Lake Union area to implement Commute Trip Reduction (CTR) programs.

Several employers in the South Lake Union area are moving additional employees to the area. For example, the Fred Hutchinson Cancer Research Center recently moved about 900 employees from Ninth Avenue N. and Howell Street to their campus on Fairview Avenue. Children's Hospital moved several hundred employees into the study area, and the University of Washington will be locating research facilities in the Blue Flame building in the fall of 2004 as the first phase of what will be a significant presence in SLU. KC Metro has had discussions with Tommy Bahamas and NBBJ as well, both of whom will be moving into the area in the near future. In addition to employers, King County has been working with neighborhood-based groups, including South Lake Union Friends and Neighbors (SLUFAN) and the South Lake Union Network (SLUNET).

CTR program elements include the following:

- Flex Pass (a greatly reduced transit pass, by neighborhood, rather than by employer as it is now – the majority of employers in SLU have this now)
- Commuter Bonus Plus (a transportation benefit to employees who carpool, walk or bicycle to work)
- Guaranteed Ride Home (for those who participate by purchasing a Flex Pass, for example, the employer guarantees a free ride home via taxi in case of emergency)
- Parking Management (e.g., through pricing or reducing hours allowed for free parking)
- Rideshare Plus (vanpool, carpool and ride matching)
- Vanpool and Vanshare (vanshare uses vans from a transportation hub such as a ferry terminal to a worksite)

Stakeholder interviews with several employers in the SLU area were conducted in December of 2003 (see Chapter 3). The interviews briefly touched on TDM programs currently in place at these worksites. The Seattle Times indicated that incentive and CTR programs for employees commuting include free carpool parking, bike facilities, and guaranteed ride home program. SBRI indicated that it is currently developing a Transportation Management Plan

for its new facility, and that bike storage and shower facilities are provided in the parking garage. REI indicated that a high proportion of employees bike to work, and that the company offers incentives and raffles each month for employees who bike or walk to work.

Types of TDM Benefits Offered

Employers in the SLU area offer a wide range of TDM benefits to their employees. Generally speaking, King County Metro plays a much larger role than the City of Seattle in terms of CTR program development. Table 4.11 indicates the percent of South Lake Union employers who stated that they either did or did not offer a TDM program.

Table 4.11: Employer TDM Benefits

TDM Program Element		1995	1997	1999	2001
Compressed Work Week	Yes	45%	57%	53%	44%
	No	55%	43%	47%	56%
Telecommuting	Yes	45%	46%	60%	63%
	No	55%	54%	40%	38%
Flex Time	Yes	55%	57%	80%	75%
	No	45%	43%	20%	25%
Guaranteed Ride Home	Yes	64%	86%	53%	44%
	No	36%	14%	47%	56%
Ridematching Services.	Yes	55%	71%	53%	50%
	No	45%	29%	47%	50%
Shuttle Service	Yes	9%	7%	7%	6%
	No	91%	93%	93%	94%
Bike Subsidy	Yes	9%	50%	20%	31%
	No	91%	50%	80%	69%
Walking Subsidy	Yes	9%	14%	20%	25%
	No	91%	86%	80%	75%
Carpool Subsidy	Yes	9%	14%	20%	38%
	No	91%	86%	80%	63%
Vanpool Subsidy	Yes	82%	71%	93%	75%
	No	18%	29%	7%	25%
Transit Subsidy	Yes	100%	93%	93%	81%
	No	0%	7%	7%	19%
Ferry Subsidy	Yes	64%	64%	67%	56%
	No	36%	36%	33%	44%
Gen. Trans Allowance	Yes	0%	0%	0%	0%
	No	100%	100%	100%	100%
Clothes Locker	Yes	73%	71%	73%	69%
	No	27%	29%	27%	31%
Uncovered Bicycle Pkg	Yes	27%	29%	33%	0%
	No	73%	71%	67%	100%
Covered Bicycle Pkg	Yes	73%	71%	87%	75%
	No	27%	29%	13%	25%
Passenger Loading	Yes	55%	50%	47%	0%
	No	45%	50%	53%	100%
Shower Facilities	Yes	82%	79%	87%	81%
	No	18%	21%	13%	19%

Source: *Modeling TDM Effectiveness: Developing a TDM Effectiveness Estimation Methodology (TEEM)* and Case Studies for the SR 520 Corridor based on King County data

It is clear that these TDM programs are having a positive influence on commuting behavior. For example, of employers in the SLU area who have offered FlexPasses to employees for 3 or more years, the percentage of employees taking transit to work is almost 19 percent, which is much higher than the 11 percent transit/rail mode share found in general census data.

Alaskan Way Viaduct "Flexible Transportation" Package

Although the geographic scope of this study is limited, a discussion of TDM must recognize that issues outside the immediate vicinity will impact how transportation demand can be managed in South Lake Union. The Alaskan Way Viaduct and Seawall Replacement Project (AWVSRP) will have a great influence on the neighborhood and on the menu of TDM options available. Each of the AWVSRP build alternatives includes a Flexible Transportation Package (FTP). The FTP is a set of programs that bring together synergistic transportation strategies that benefit from being considered and implemented in a coordinated fashion. It comprises strategies that are usually categorized as transportation system management (TSM), transportation demand management (TDM), intelligent transportation systems (ITS), transit services and pedestrian and bicycle improvements. It comprises a range of mostly low-cost transportation demand and system management and human powered strategies that are targeted at specific challenges or travel markets.

Following is a list of potential flexible transportation strategies included in the AWVSRP:

- Pedestrian and Bicycle Surface Street Improvements
- Pedestrian Over-Crossings To/From Colman Dock Ferry Terminal
- Waterfront Streetcar Track Capacity Expansion
- Expansion Of Vanpool/Vanshare Program
- Direct Transit Service Enhancements, Including Potential Water Taxi Service
- Construction Worker/Commuter Shuttle Service
- Expand FlexPass Program in Downtown Seattle During Construction
- Conversion of Long-Term Downtown Commuter Parking To Short-Term and Carpool Parking
- Traveler Information Systems
- Parking Lot Information Systems
- Small Employer Market Development
- Personalized Transportation Consultation
- Incident Management Systems
- WSDOT Traffic Systems Management Center Upgrade
- Transit Priority Measures And Facilities
- Enhanced Traffic Signal System
- Enhanced Signage and Intelligent Transportation Systems
- Remote Ferry Holding Area Or Alternative Management Concept
- Ramp Metering
- Ramp Pricing With HOV Exemptions
- Smart Work Zones
- Event Management Systems and Services
- Temporary Transit or Truck-only Lanes
- Truck/Commercial Vehicle Travel Operations Restrictions and Prioritizations
- Flexible Transportation Program Management and Monitoring

- Demonstration and Research Programs

Because the SLU Study and AWVSRP project areas overlap, the SLU study will develop TDM strategies that are compatible with and, if possible, build upon the strategies being discussed as part of the AWVSRP project.

Open Space

Most of the open space in the SLU area consists of parks. In addition, several "Green Streets" have been designated by the City of Seattle.

Existing Parks

The South Lake Union area includes three existing parks, as shown in Figure 4.16.

Cascade Playground

Cascade Playground is located in the block bordered by Thomas Street, Pontius Avenue N., Harrison Street, and Minor Avenue N. Cascade Playground has a children's play area, a basketball hoop, a shady picnic table, a wide field, and restrooms. The park is adjacent to an active community p-patch, and is undergoing improvements, including increased access on all sides.

Denny Park

Denny Park is a 6.4-acre park located in the block bordered by Denny Way, Ninth Avenue, John Street, and Dexter Avenue N. Of historical note, it is the very first City Park, built in 1884.

Lake Union Park

The south end of Lake Union is currently home to an under-utilized park and marine facility. The existing park will be redeveloped to create a 12-acre regional park and waterfront activities center.

Green Streets

A "Green Street" is one in which a variety of treatments (such as sidewalk widening, landscaping, traffic calming, and pedestrian-oriented features) are emphasized for pedestrian circulation and open space use. Thomas and Harrison Streets, between Fairview and Eastlake Avenues, are designated "Green Streets" in the South Lake Union area. At this time, the streetscape on these streets is not significantly different than other streets in the SLU neighborhood. Changes proposed for these streets will focus on improved pedestrian facilities and connections to pedestrian oriented locations and uses.

Figure 4.16: Existing Parks Map