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## CHAPTER 8 RECOMMENDATIONS AND IMPLEMENTATION STRATEGY

Based on the evaluation and rating analysis, a “preferred” package of improvements was selected, as shown in Figure 8.1. This chapter describes the recommended improvements for the roadway network, transit system, non-motorized network, and open space; and also describes recommended transportation demand management strategies.

The Recommended Scenario includes changes on Aurora Avenue N/SR 99 that are part of an AWVSRP Alternative. These changes include the widened Mercer underpass, Thomas overcrossing, and removal of Broad Street. This alternative for Aurora Avenue N. was included as part of all the Build Alternatives for the AWVSRP. Another option for Aurora Avenue N/SR 99 is to lower the grade of Aurora Avenue N and build crossings over the lowered Aurora Avenue N at Thomas, Harrison, Republican, Mercer, and Roy Streets, or a subset of these cross streets. This AWVSRP Alternative would better advance the goal of connecting SLU to Queen Anne and Seattle Center, and it responds to some comments on the SLU Transportation Study draft recommendations that there should be more crossings of Aurora Avenue N. The AWVSRP will be identifying a preferred alternative in the fall of 2004. If the Lowered Aurora Alternative is part of the preferred alternative, or carried forward for additional analysis, the Recommended Scenario for the SLU Transportation Study will be amended to reflect the AWVSRP.

The following renderings graphically display some of the components of the Recommended Scenario (see Figures 8.2 through 8.4).

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### Roadway Network

The Year 2030 Recommended Scenario network includes the following roadway improvements for the South Lake Union Area:

#### **Implement Two-Way Mercer/Narrow Valley**

- Modify Mercer Street so that it operates as a two-way facility from Fairview Avenue to Fifth Avenue North:
  - Between Fairview and Dexter Avenues, construct a seven-lane two-way facility (three lanes each direction plus turning lane) with parking on both the north and south side of the street. See Figure 8.2 (cross section), Figure 8.3 (plan view) and Figure 8.4 (rendering of Mercer Street at Westlake Avenue). Note that for year 2030 operations, it was assumed that the south side parking lane between Westlake Avenue and Fairview Avenue would be converted to a fourth eastbound travel lane.
  - From Dexter to Fifth Avenue, widen Mercer Street to the above noted seven-lane section and widen the existing Aurora Avenue underpass to accommodate the expanded cross section (note that the proposed improvement does not include parking in this section).
- Reduce the number of traffic lanes on Valley Street to two lanes plus left-turn lanes to enhance the park environment and integrate the park with the neighborhood. This includes adding bicycle lanes in both directions, a parking lane on the south side of

the street, and widened sidewalks. See Figure 8.5 Valley Street Typical Cross Section and Figure 8.6 Valley Street Typical Plan View)

- Roy Street (similar to Valley Street)
- Reconfigure the Valley Street/Fairview Avenue N. intersection to de-emphasize Valley Street and shift "mainline" status to Fairview Avenue. See a rendering of the proposed changes at the Fairview Avenue N and Valley Street intersection in Figure 8.8.
- Reconfigure Fairview Avenue N between Mercer Street and Valley Street to accommodate two NB and two SB lanes (with left turn pocket(s)).
- Add a traffic signal at the intersection of Dexter Avenue and Republican Street.
- Install signals at Terry Avenue N. and Mercer Street and Terry Avenue N and Valley Street to improve north/south access for pedestrians and local traffic.
- With Seattle Center and the surrounding communities, evaluate the conversion of Mercer and Roy Streets to two-way operation (within the existing right-of-way) between Fifth Avenue N and First Avenue N to provide a continuous two-way connection to Elliott Avenue. Initial review of this option identified several advantages, including: direct westbound access to the Mercer Street Parking Garage and Uptown, relief of the bottleneck at Roy Street and Queen Anne Avenue North, and traffic calming on Mercer Street through the Seattle Center Theater District.

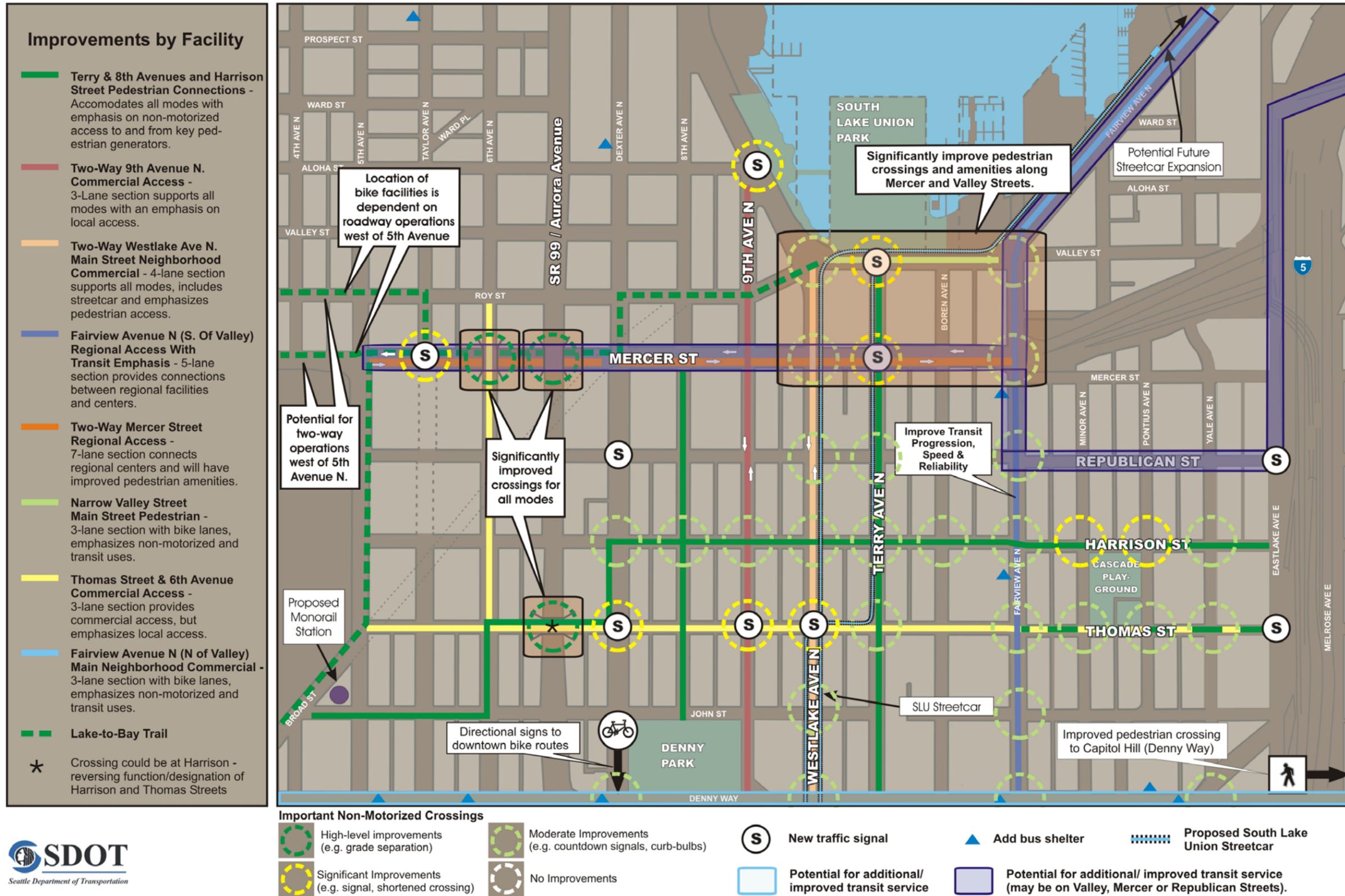


Figure 8.1: Recommended Scenario



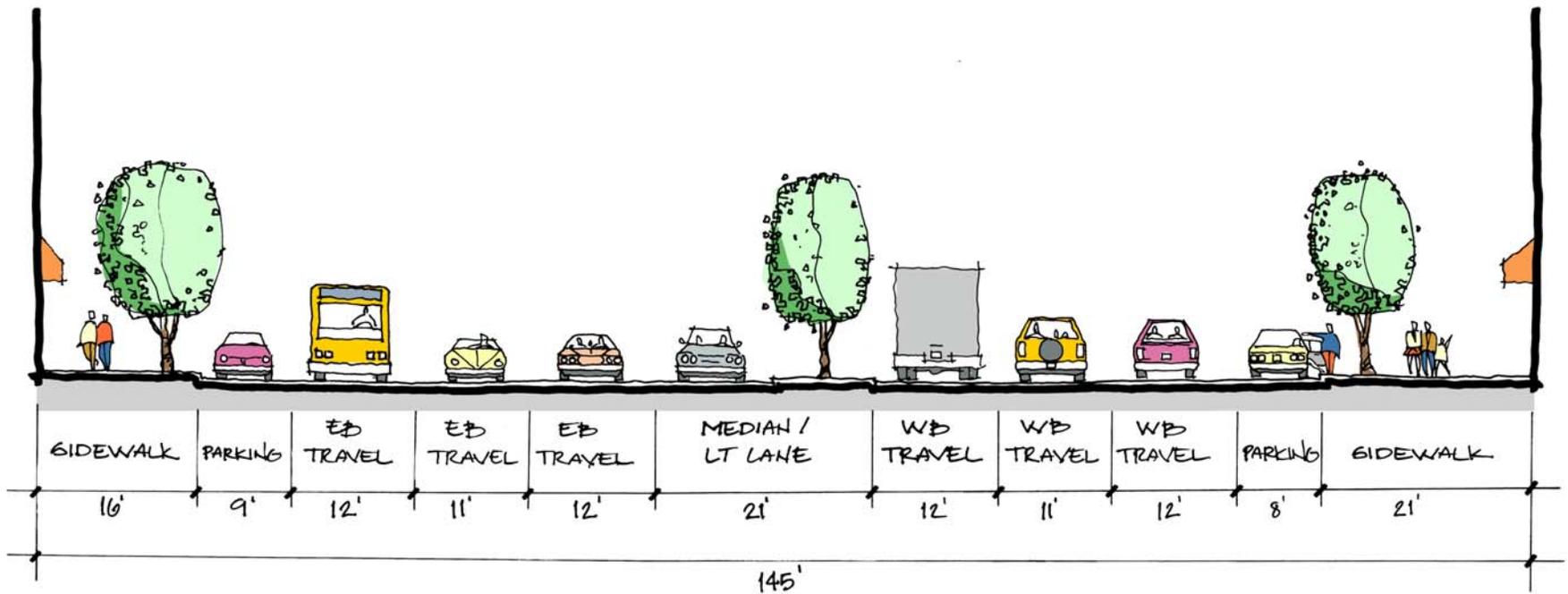


Figure 8.2: Mercer Street Typical Cross-Section

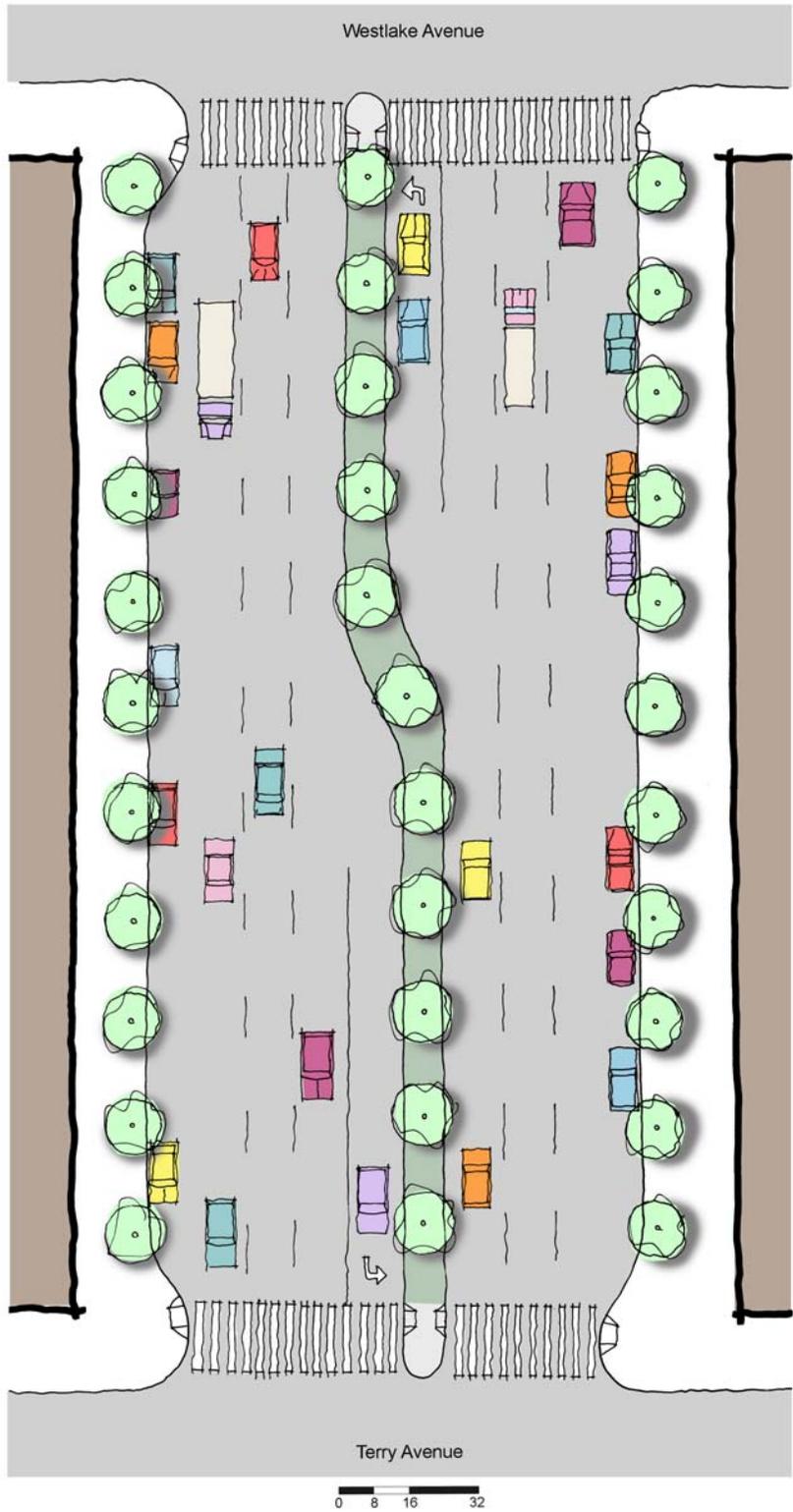


Figure 8.3: Mercer Street Typical Plan View



**Figure 8.4: Proposed Mercer Street at Westlake Avenue, Looking East**

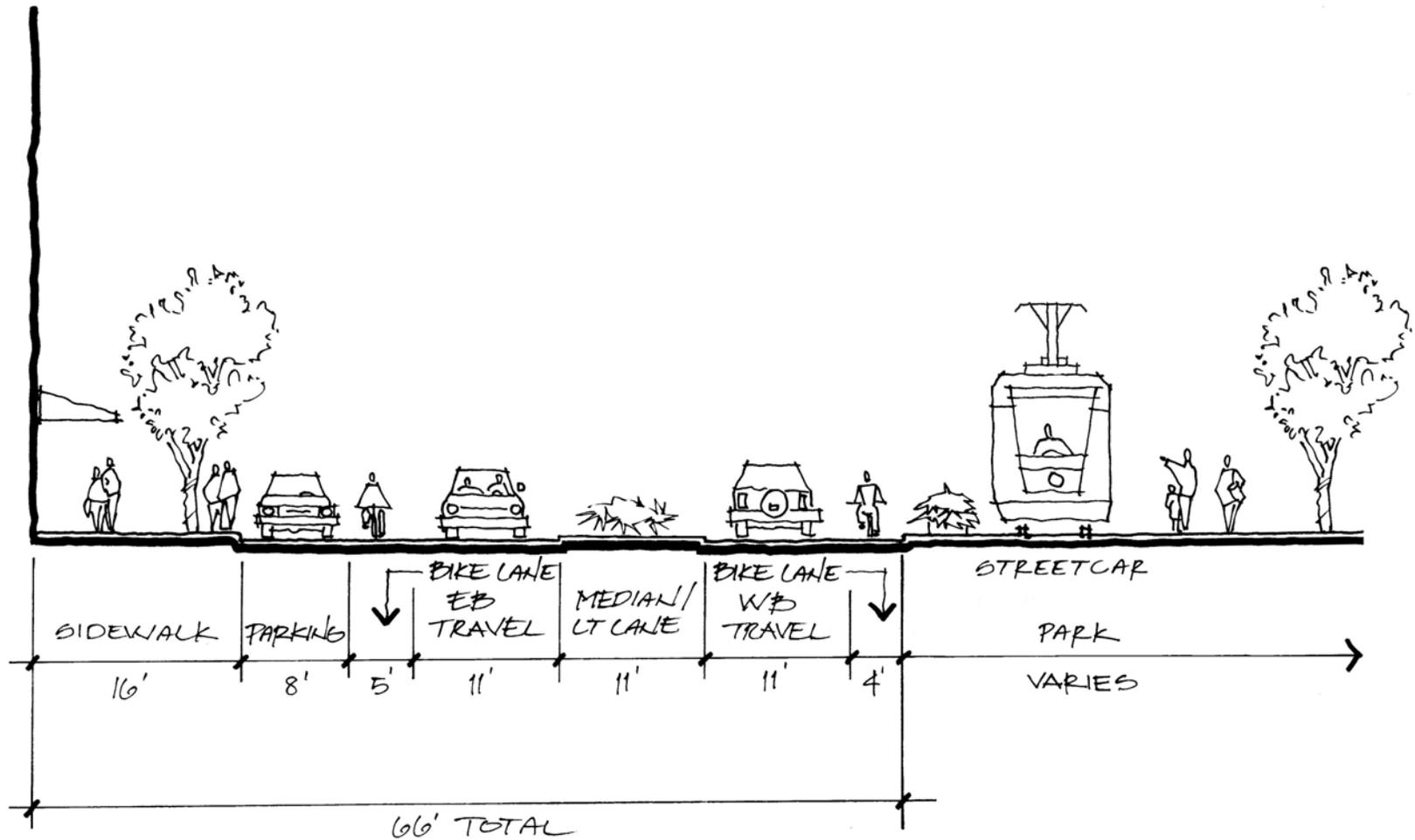


Figure 8.5: Valley Street Typical Cross-Section

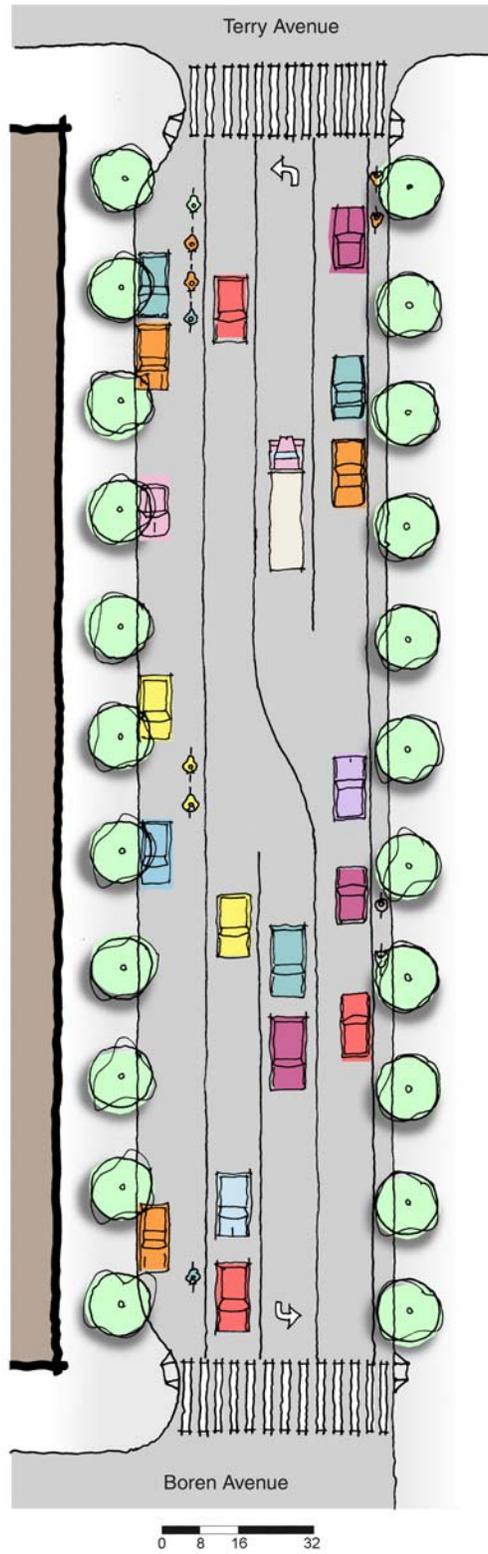


Figure 8.6: Valley Street Typical Plan View



Figure 8.7: Proposed Valley Street at Westlake Avenue, Looking West



**Figure 8.8: Proposed Valley Street at Fairview Avenue North, looking west**

### **Modifications to Mercer/Fairview/I-5 Ramp Intersection**

The following improvements would logically be included in the Mercer Corridor Project, but could be implemented independently.

- Add a fourth receiving lane to the I-5 on-ramps for eastbound traffic to assist in traffic flow out of SLU and onto I-5.
- On northbound Fairview Avenue at the approach to the I-5 ramps, widen roadway (for an additional northbound right-turn lane) and improve signage.
- Restrict the Mercer Street eastbound through connection to Mercer Place at the Mercer Street and Fairview Avenue intersection to improve the Mercer Street/Fairview Avenue intersection operations.

### **New Connection Over Aurora Avenue North/SR 99**

- Build a new Aurora Avenue N. overpass at Thomas or Harrison Street
- Add left-turn lanes along Thomas (Harrison) Street from Fairview Avenue to Fifth Avenue. Requires removal of parking on one side of the street.

The Widened Mercer Underpass Alternative for the AWVSRP includes an overpass of Aurora Avenue at Thomas Street. However, an overpass at Harrison also appears to be feasible and may be a better route for access to Seattle Center parking. A Harrison overpass may also allow for a wider bridge to better accommodate pedestrians with less impacts to adjacent parcels. The AWVSRP project should coordinate with Seattle Center and others to determine the appropriate location for this overpass.

### **Two-Way Traffic on Ninth and Westlake**

- Modify Westlake Avenue and Ninth Avenue so they operate as two-way facilities from Aloha Street to Denny Way. Westlake would be a four- to five-lane facility, and Ninth Avenue a three-lane facility. Modifications include re-striping, signal modifications and some widening near Mercer Street. Removal of parking would be required between Republican and Mercer Streets to accommodate left-turn lanes. See proposed cross-sections in Figures 8.9 and 8.10.

SDOT will work with the neighborhood and bicyclists that now use Westlake and Ninth Avenues through the design of these streets to determine if bike lanes can be incorporated into the cross-section, or if an alternative route is required.

### **Build Street Grid West of Aurora Avenue North/SR 99**

The removal of Broad Street and new connections across Aurora Ave N/SR 99, allows the City to create a complete street grid between Aurora Avenue N/SR 99 and Fifth Avenue N. This provides new north-south and east-west streets to help relieve existing streets, such as Fifth, and it supports future re-development of properties in this area. SDOT will work with Seattle Center and neighboring communities to design a street network that provides convenient access to Seattle Center and Queen Anne, and supports future plans for this area.

- Build an overpass across Mercer Street at Sixth Avenue to provide a new north-south arterial connection (Queen Anne to Denny) between Aurora Avenue N. and Fifth Avenue N.

- Remove Broad Street from Fifth Avenue to Ninth Avenue to allow for the construction of a widened two-way Mercer Street and reconnection of the street grid west of Aurora Avenue N. in this area.
- Install a signal at the intersection of Taylor Avenue and Mercer Street

**Modified Access to Northbound I-5**

- Southbound on Eastlake Avenue, add a turn lane (near Denny) to allow left-turns from Eastlake Avenue to the northbound I-5 express lanes.

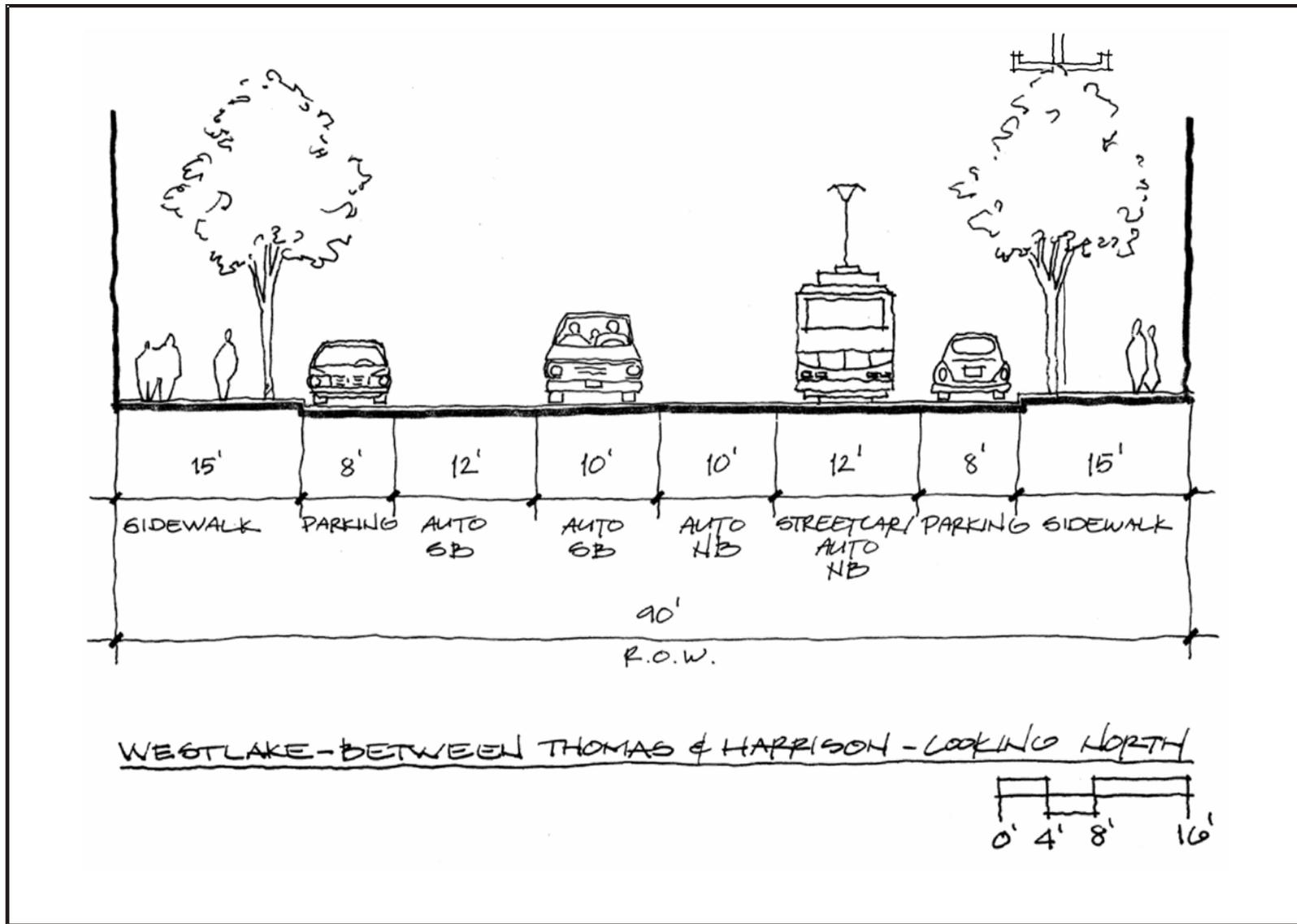


Figure 8.9: Proposed Two-Way Westlake Avenue Typical Cross-Section

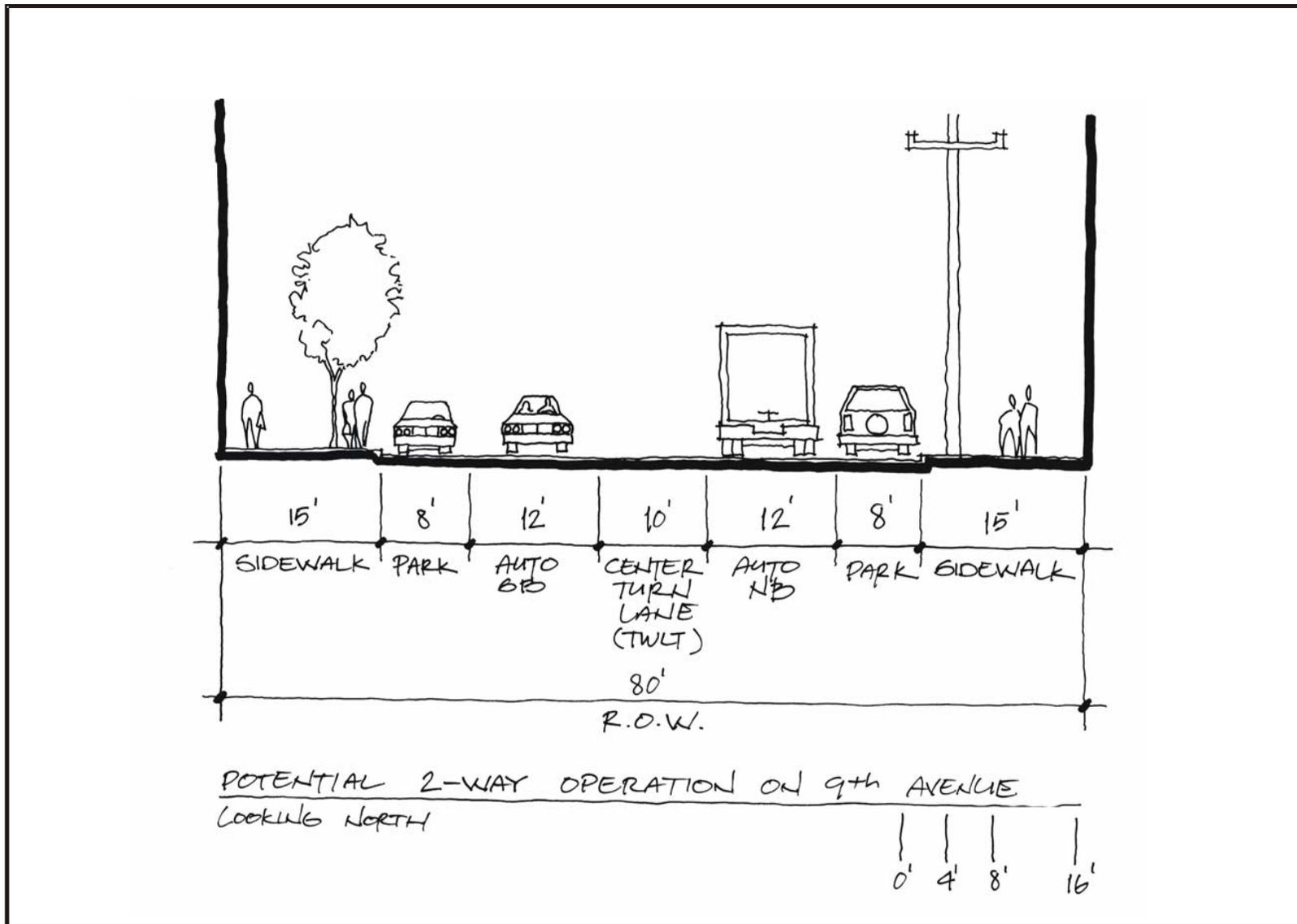


Figure 8.10: Proposed Two-Way Ninth Avenue Typical Cross-Section

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## Transit

For the Recommended Scenario, the following transit-related improvements are recommended for the SLU area. Figure 8.11 graphically displays many of these recommended improvements. These improvements benefit not only SLU, but adjacent neighborhoods, such as Denny Triangle, Queen Anne and Eastlake.

### **New or Modified Local Transit Service To/Through the SLU Neighborhood**

- A new Streetcar line to better connect downtown to the Denny Triangle and SLU area. The streetcar route would connect the Westlake Center area with South Lake Union via Westlake Avenue northbound and Terry Avenue southbound (between Valley and Thomas Streets).
- Modify route 74 to better serve the SLU area by running through the area, rather than only skimming the edge of the SLU area near the Seattle Center as it does currently. Two potential routing options are possible. The modified route 74 could run east on Mercer Street to Dexter Avenue, north on Dexter Avenue, east on Roy/Valley Streets and then north on Fairview Avenue. Alternatively, it could run east on Mercer Street to Fairview Avenue, then north on Fairview Avenue. At the west end, the new routing could potentially also connect with the Monorail's Fifth Avenue and Broad Street station.
- A new transit route between Uptown and Capitol Hill. This proposed route would run from Uptown through South Lake Union and on to the north side of Capitol Hill. Specifically, it would follow Mercer Street to Dexter Avenue, Dexter Avenue to Republican Street, Republican Street to Eastlake Avenue, Eastlake Avenue to Lakeview Boulevard, Lakeview Boulevard to Belmont Avenue, Belmont Avenue to Roy Street, and Roy Street to Broadway. Because of the grades on Belmont Street, it is likely that this would need to be an electric trolley bus route, or other electric technology. An alternative routing through SLU could be along Mercer Street, rather than Republican.
- Increase the frequency of north/south routes through the SLU area (i.e., routes 70, 26, 28). For example, if service on route 70 is doubled, this would represent an additional 29,800 service hours.
- Increase the frequency of Route 8 along Denny Way from a 30-minute to 15-minute headway.
- Reduce effective headways by consolidating SLU routes to use the same streets through the downtown area.

### **Create Transit Emphasis/Transit Priority Street on Fairview Avenue North**

These improvements are intended to facilitate transit flow along Fairview Avenue N. through the study area. The improvements include the following:

- Transit Signal Priority (TSP) northbound at Denny Way.
- Advanced green signal and queue jump lane on Fairview Avenue northbound at Harrison Street.
- TSP on Fairview Avenue northbound and southbound at Mercer Street.
- TSP on Fairview Avenue southbound at Valley Street.

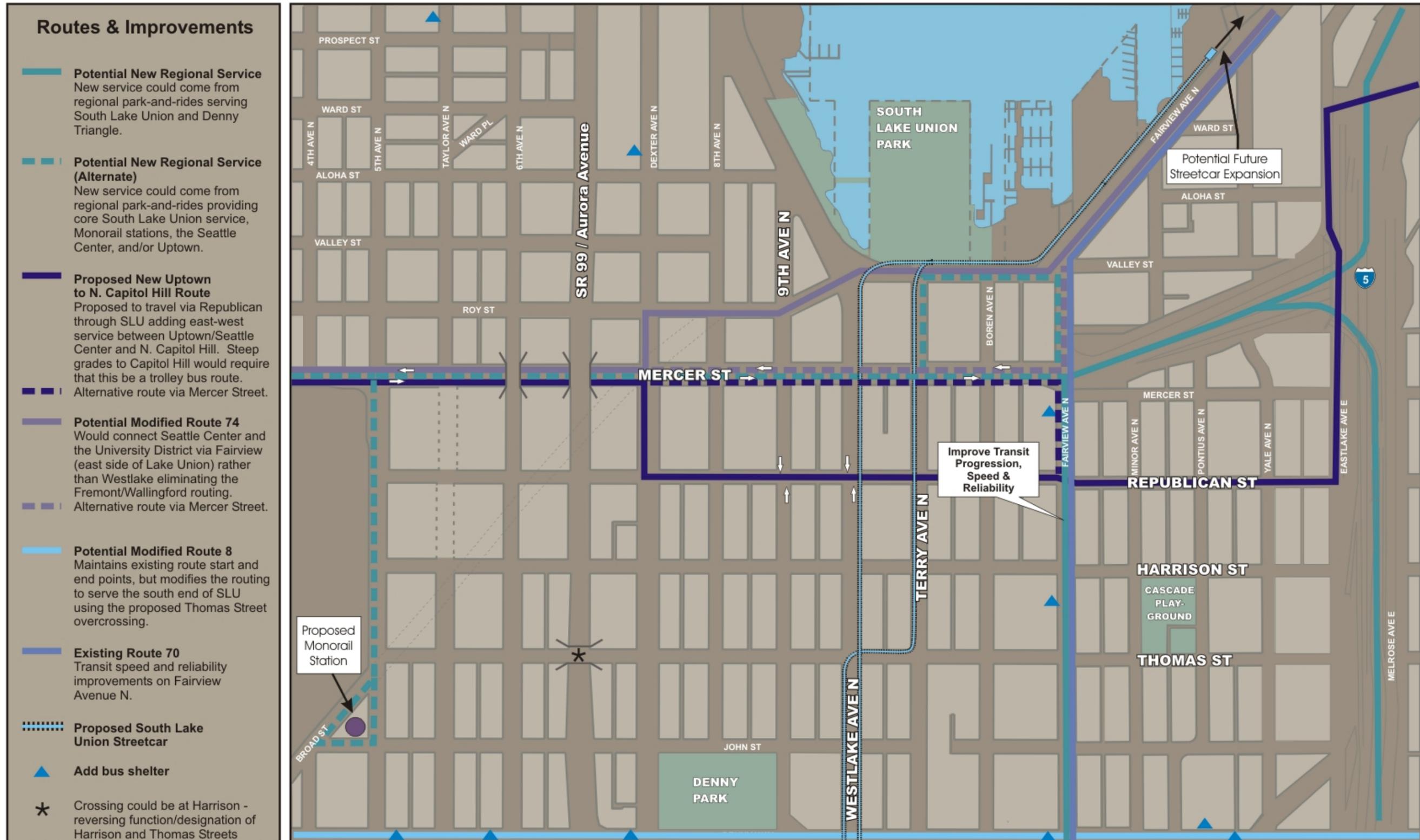


Figure 8.11: Proposed Transit Improvements for the SLU Area



## **Improve Regional Bus Service to SLU and Adjacent Neighborhoods**

If the SLU area is to reach its potential as an urban village and accommodate the level of development projected for it combined with the projected growth in the Denny Triangle area, it is critical that a higher level of regional transit service also be considered for the area. The streetcar and existing bus service will help connect SLU to regional transit service in the downtown area, but increased direct service may be warranted as employment increases. This is important in order to accommodate the higher level of travel to and from the area and to provide a reasonable alternative to making these trips using the single-occupant auto (SOV).

Direct regional service could be provided from park and ride lots to the north, east and south of the Study Area via the Mercer/I-5 ramps or other routing options. Service from the south or from the east of Lake Washington via I-90 might be provided by extending existing regional service through the north end of downtown. New regional service using the Mercer/I-5 ramps could include one or more of the following route options within SLU:

- To SLU and Denny Triangle via Fairview, Westlake or Dexter Avenue.
- To the proposed Monorail station at the intersection of Fifth Avenue N. and Broad Street
- To Uptown and the Monorail station at Key Arena

A recent sample of existing SLU employees revealed that the highest proportion of employees live in the North Seattle area. This suggests that express service from the north end, perhaps from the Northgate Park and Ride lot, might be a first priority for regional service.

## **Connecting to the Regional Transit System**

- Connecting SLU to the Regional Light Rail System. Extend the streetcar to the University of Washington and a UW light rail station. This would enhance the streetcar's role as a connecting route to light rail for Denny Triangle, SLU, and Eastlake with connections in Downtown (Westlake Center) and the University District.
- Connecting SLU to the monorail network. Monorail connections could be considered during Phase 2 Monorail planning.

## **Bus Layover Space**

King County Metro and the City of Seattle have been evaluating potential locations for bus layover space to replace the Convention Place Station (CPS) layover spaces that will be removed when transit-oriented development construction begins at CPS. The blocks bordered by Thomas Street, Dexter Avenue, Denny Way, and Westlake Avenue were evaluated, and several on-street spaces were approved for later implementation by the Seattle Department of Transportation. These spaces are primarily on Westlake Avenue, Ninth Avenue and John Street, surrounding the current Denny Playfield.

However, as bus routes and service is added to the SLU area, additional bus layover space in the SLU area will become increasingly important. It will be particularly critical if new bus service terminates in the SLU area.

## Shelters

As presented in Chapter 4 (*Existing Conditions*), a bus stop is generally eligible for a shelter if it has over 50 people boarding at the location each day. Table 8.1 shows the locations of the bus stops that have over 40 boardings per day in the South Lake Union area, and whether or not bus shelters are currently provided and/or improvements are recommended for these bus stops. At this time, three shelters are already in design or under construction and four locations have been identified for new shelters (eastbound on Denny Way at Sixth Avenue, southbound on Dexter Avenue N at Aloha Street, southbound on Fairview Avenue N at Mercer Street, and southbound on Taylor Avenue N at Prospect Street).

In the table below, a response of “*Shelter Constraints*” in the Improvement Recommended column indicates that the location was studied for a potential bus shelter by King County Metro and either private right-of-way issues or limited space constrains the placement of a shelter at this location. As the specific parcels redevelop, setbacks are recommended to allow for the installation of a shelter. For bus stops with either existing shelters, or where space constraints negate the possibility of a shelter, property owners are encouraged to consider awnings and leaning rails when upgrading their exteriors.

**Table 8.1: Recommended Improvements to Bus Stops**

Route(s)	Dir	On Street	Cross Street	Daily Boardings	Bus Shelter	Improvement Recommended
3, 4, 16	N	5th Avenue N	Broad Street (Thomas)	99	Yes	Property owners are encouraged to consider awnings and leaning rails when upgrading their exteriors.
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	<i>Shelter Constraints.</i>
3, 4, 16	N	5th Avenue N	Denny Way	41	No	<i>Shelter Constraints.</i>
8	E	Denny Way	Stewart Street	100	No	Shelter Already in Design/Construction
8	E	Denny Way	Cedar Street (5th Avenue)	83	No	<i>Shelter Constraints.</i>
8	E	Denny Way	Dexter Avenue	75	No	Shelter Already in Design/Construction
8	E	Denny Way	6th Avenue	71	No	Potential new shelter
8	E	Denny Way	Fairview Avenue	53	No	<i>Shelter Constraints.</i>
8	W	Denny Way	Pontius Avenue N	43	No	Shelter Already in Design/Construction
26, 28	S	Dexter Avenue N	Aloha Street	51	No	Potential new shelter
70, 71, 72, 73	S	Fairview Avenue N	Harrison Street	82	No	<i>Shelter Constraints, Property Owner May Build Own Shelter</i>
70, 71, 72, 73	S	Fairview Avenue N	Mercer Street	54	No	Potential new shelter
3, 4	S	Taylor Avenue N	Prospect Street	49	No	Potential new shelter

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## **Pedestrian and Bicycle**

The Recommended Scenario includes a number of bicycle and pedestrian improvements. Some are incorporated into the arterial street recommendations and improvements (e.g., those proposed for Mercer and Valley Street), while others are specific, or independent of other improvements. These improvements are graphically represented in Figure 8.12.

### **Lake-to-Bay Trail**

Incorporate the Lake-to-Bay Trail into the design of the Mercer Corridor Project and the AWVSRP. This includes a continuation of the bicycle lanes on Valley Street west onto Roy Street to Dexter Avenue and an enhanced pedestrian trail along this route. The Lake-to-Bay Trail would be incorporated into the Widened Mercer Underpass and could include on-street bike lanes and/or wide sidewalks. This route allows for a more direct route to the north side of the Seattle Center properties and for a wider non-motorized facility than can be accommodated by the Thomas Street overpass.

### **New Bike Lanes and Signed Bike Routes**

New bike facilities on Fairview Avenue and Valley Street, along with the existing Westlake Trail, will create a comprehensive bike system around the south end of Lake Union and to the Lake-to-Bay Trail. Bike facilities are recommended on Fairview Avenue N., between Eastlake Avenue E. and Valley Street. These could be in the form of a wide curb lane or striped bike lanes and could be combined with the addition of parking along both sides of Fairview Avenue N.

New bike lanes are also proposed on Valley Street between Fairview and Westlake Avenue N. and continuing west on Roy Street between Westlake and Dexter Avenue N.

The design for two-way operation of Westlake and Ninth Avenues should accommodate bikes on one of these streets or a parallel route in the vicinity.

The SLU Transportation Study is also recommending the installation of bike route signs between the Dexter Avenue bike lanes and the existing Second Avenue bike lanes and the proposed Fourth Avenue bike lanes in downtown.

### **Terry Avenue Design Guidelines Project**

This study also recommends the implementation of improvements proposed by the Terry Avenue Street Design Guidelines project, which will transform Terry Avenue into a key pedestrian corridor. Pedestrian and bicycle use will be the main focus, but cars will continue to use Terry Avenue for access to adjacent properties.

### **Improved Street Crossings**

The SLU Transportation Study is also recommending the modification of a number of key intersections to improve pedestrian access and mobility as well as increasing the comfort of non-motorized travel. Improved pedestrian crossings are incorporated into the Two-Way

Mercer and Valley Street project, including curb bulbs, wide sidewalks, landscaping and new signals at Terry Street.

Other streets proposed to receive improved intersection crossings include Westlake Avenue, Republican Street, Thomas Street, and Fairview Avenue.



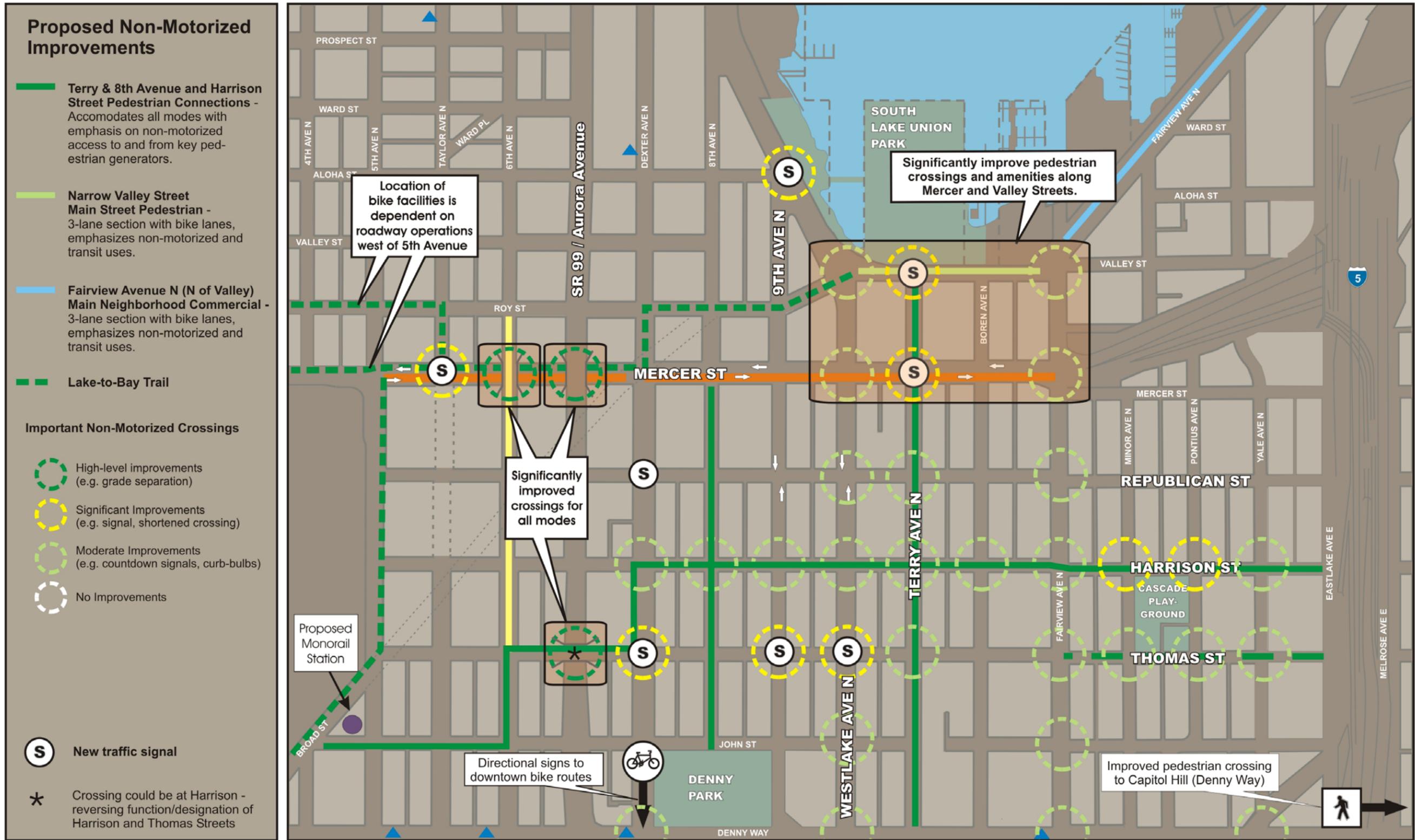


Figure 8.12: Proposed Non-Motorized Improvements



### **Green/Greenscape Street Extensions**

Harrison and Thomas Streets (between Eastlake and Fairview Avenues) are currently designated Green Streets. The SLU Transportation Study recommends extending the Green Street designation of Harrison Street to Dexter Avenue N or Fifth Avenue N., the east edge of the Seattle Center campus. The Harrison Green Street design could include widened sidewalks/planting strip (from 11 to 13 feet), narrowed travel lanes (14 to 12 feet) and curb bulbs between Dexter and Eastlake Avenues. See Figure 8.13 for typical plan layout of Harrison Street.

The design of Thomas Street, between Fairview and Eastlake, should consider the potential for additional traffic due to the Thomas Street Overpass at Aurora Avenue N/SR 99. However, no additional vehicular capacity is recommended along this section of Thomas. While this study is not recommending the Green Street extension for Thomas Street, both Thomas and Harrison Streets will have a reduced emphasis on vehicular throughput between Fairview and Eastlake Avenues. It is important to note that the Thomas Street Overpass could be relocated to Harrison Street through the AWVSRP. If this is indeed the case, the above designations for Thomas and Harrison Streets should be switched.

In addition to the above noted Green Street changes traffic control changes around Cascade Park were reviewed and considered. Consistent and appropriate signing and traffic control along Thomas and Harrison Streets and Minor, Pontius and Yale Avenues should be implemented based on the final decision for the AWVSRP's Thomas (or Harrison) Street Overcrossing.

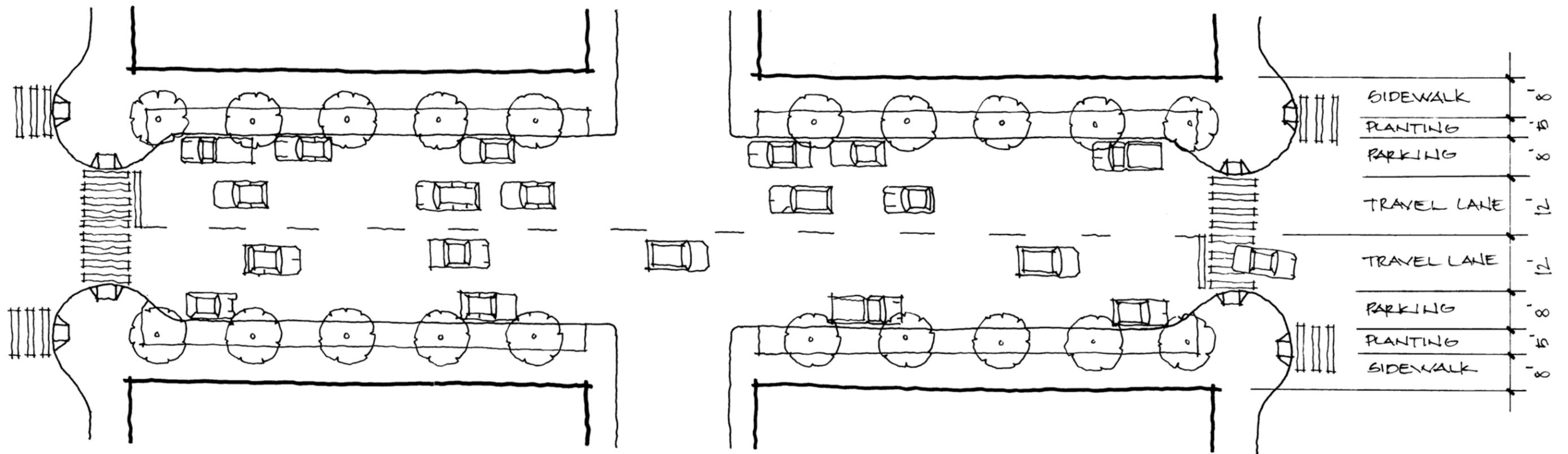
### **Connections Across Aurora Avenue N/SR 99**

The Recommended Scenario includes new connections across Aurora Avenue N/SR 99 via the widened Mercer Underpass and the Thomas Street Overpass, which are part of an alternative for the AWVSRP. While this improvement significantly advances the goal of connecting South Lake Union and Queen Anne, additional crossings should be considered. The ultimate scenario is a lower Aurora Avenue North, allowing east-west crossings from Thomas to Roy Street.

### **Denny Way Pedestrian Improvements**

Pedestrian improvements in the Denny Way corridor include the addition of a sidewalk on the north side of the Denny Way crossing of I-5 and intersection improvements along Denny Way that include curb bulbs on the side streets and countdown signals for pedestrians crossing Denny Way (north-south).





Harrison Street Plan (Typical Condition)

Figure 8.13: Harrison Street Plan



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## Transportation Demand Management

The recommended physical improvements to South Lake Union's transportation infrastructure will help make South Lake Union an accessible neighborhood and a desirable place to live, work, shop and visit. However, without aggressive transportation demand management actions, growth in traffic will overcome even the best street and pedestrian network, and divert resources from productive space to automobile storage.

In the year 2000, 71% of workers commuting to South Lake Union drove alone. If this trend continues, accommodating planned growth will require about 11,500 new parking spaces (equivalent to about 13, eight-story garages) to accommodate the increased automobile use. Providing this quantity of parking would cost private developers approximately \$286 million. This estimate doesn't include the cost to replace existing surface parking that may eventually be developed, so the cost of providing parking if 71 percent of people continue to drive alone would likely be much higher. In addition to parking costs, continued use of automobiles at current rates would also significantly worsen traffic congestion for travel to and through South Lake Union. Transportation demand management strategies have the potential to reduce these costs and impacts considerably.

Realizing South Lake Union's growth potential will require that the City of Seattle, transit providers, private developers, businesses, community organizations, and residents minimize the demands for automobile trips and maximize the use of other modes. Fortunately there are many strategies available to reduce dependency on private automobiles while providing equal or superior access and mobility.

As this study noted in the review of existing conditions, the ability to effectively manage transportation demand depends on availability of choices and a built environment that supports and reinforces TDM strategies.

- Providing on-street bicycle facilities -- such as bicycle lanes, and route signage will invite more bicycling to South Lake Union. These facilities can increase people-moving capacity of the transportation network at very low cost.
- Increasing transit service, making service adjustments to meet the needs of the South Lake Union market.
- Providing transit priority treatments to ensure the speed and reliability of bus service is necessary to make transit an attractive alternative to automobiles. Investing in roadway treatments that prioritize transit vehicle movements will keep transit moving at lower cost, with greater customer satisfaction.
- Enhancing pedestrian environments (with features such as improved crosswalks, new street crossings, and countdown signals) and designing streetscapes to 'green street' standards will promote walking trips, increase access to transit, and support parking management strategies.
- Encouraging a mix of uses to support residential and employee needs reduces the use of automobiles for everyday errands. A mix that includes restaurants, cleaners, pharmacies, etc. allows people living in the neighborhood to walk for more of their

trips. In addition, employees are less likely to feel that they need to have a car at work to get to lunch or run errands if everything they need is within walking distance.

Even with significant transportation system improvements in South Lake Union, maximizing the system's capacity to move people and goods will require public and private organizations to implement additional TDM programs. Successful TDM strategies maximize the value of transportation investments.

Some proven TDM strategies are presented below. These and other strategies can be used to supplement physical improvements to the South Lake Union transportation system.

### **Expand Choice**

Strategies that expand trip choices do so by making alternatives to automobile trips easier to use (such as increased transit service, and physical infrastructure changes) or by removing barriers that make people reluctant to make different choices (such as providing means for mid day trips and emergency rides home).

#### *Alternative Work Schedules*

Encouraging employees to adopt non-standard work schedules such as (4/10 or 9/80) reduces the burden on the transportation system by pushing trips to the edges of peak commute times and eliminating up to 20% of an employee's commute trips for employees who regularly work four, ten-hour days per week.

#### *Bicycle Improvements*

In addition to providing bike lanes, routes, bicycle way finding, and paths, improvements to support bicycling include amenities at trip destinations such as secure bicycle parking for commuters, shower and locker facilities, short-term bicycle parking for non-work trips, and access to space for minor repairs. The comparatively easy grades in South Lake Union and its proximity to major bicycle paths and routes make bicycle improvements an especially important consideration.

#### *Bicycle/Transit Integration*

Area transit providers provide access to take bicycles on or in transit vehicles as well as providing bicycle lockers at park and ride lots. Providing more secure parking at or immediately adjacent to transit at the work end of the trip can extend transit's reach to South Lake Union. Bikestation-type facilities, serving the north end of downtown and the Seattle Ferry Terminal can improve bicycle access to South Lake Union. These facilities provide secure bicycle parking, repair and maintenance services, changing rooms and other amenities for bicyclists.

#### *Car Sharing*

Car sharing organizations such as Flexcar provide access to an automobile on an hourly basis. Car sharing eliminates the need to drive (or maintain) a private vehicle for occasional short trips. It also provides a cost-effective alternative to maintaining fleet vehicles for many businesses. In mixed use environments the combination of daytime business and employee

personal use, and residential weekend and evening use, makes car sharing a very attractive TDM tool that uses parking resources very efficiently.

#### *Guaranteed Ride Home*

Programs that provide a ride home in the event of illness, emergency, or unexpected need to work late encourage ridesharing and transit use among people who might otherwise see a need to drive alone in the event of unforeseeable transportation needs.

#### *Walking*

Design and development of pedestrian-friendly environments will support the walk mode for non-work trips within the neighborhood. Creating pedestrian connections to residential neighborhoods adjacent to South Lake Union will increase walking as a commute option. Over the long term residential and mixed-use development will be essential to establishing walking as a major travel mode to and within the neighborhood.

#### *Ridesharing/ Carpooling*

Compared to adjacent neighborhoods, South Lake Union currently has low transit use and high drive-alone commute mode shares. Ridesharing both in the form of carpools and vanpools may provide a necessary transitional mode while more transit service develops. Providing priority access for HOVs will help to encourage ridesharing. Priority access may take the form of priority access to and from Interstate 5, as well as preferred parking access on neighborhood streets.

#### *Shuttle Services*

Shuttle services might be used in South Lake Union as a transition strategy to fill gaps in transit service as the neighborhood is built out. For example, in order to avoid constructing excess parking, developers might choose to use existing off-site parking with shuttle service until employment densities support additional transit service. Shuttle service can also extend the reach of existing transit service. This shuttle service could be publicly or privately operated.

### **Encourage Mode Shift**

In addition to providing the means to make different choices and removing barriers to choice, TDM programs must also make people aware of the options that are available. Although the bulk of TDM efforts may focus on transit, it is important that TDM invite travel to and within SLU by a variety of means.

#### *Bicycling Encouragement*

Programs to encourage bicycling typically include information on commuting equipment, route selection and bicycle maps, and information on availability of and access to workplace amenities such as bicycle parking and shower and locker facilities. Bicycling encouragement can also include education and training programs to give cyclists the skills and confidence to ride safely in urban environments. Bicycling encouragement programs are often supported by local bicycling organizations such as the Cascade Bicycle Club and the Bicycle Alliance of Washington, both of which have professional staff. Existing businesses in South Lake

Union are strong supporters of bicycling and their efforts and experience might be leveraged to make the neighborhood a model for bicycle commuting in Seattle.

#### *Commuter Financial Incentives*

Financial incentives are often an effective means to encouraging commuters to try a different form of travel to work. They can also be effective in promoting mode shift where parking prices are low compared to the price of transit. Financial incentives to use transit are often provided in the form of discounted transit passes or transit tickets or rebates. Incentives are typically distributed and administered by employers.

#### *Parking Pricing/ Parking Cash-Out*

Free, employer-paid parking is a strong deterrent to transit and HOV use. Implementing parking charges for employees makes transit more attractive. In situations where employers pay for parking, offering a payment in lieu of free parking (parking cash-out) is a way to provide a financial incentive without eliminating an employee benefit. Instituting pricing for parking benefits or offering cash-out of parking paid for by employers may be important tools in South Lake Union. As redevelopment occurs providing free parking to employees will become increasingly costly for employers creating an opportunity to establish pricing and cash-out.

#### *Transportation Cost Analysis*

People tend to underestimate the costs of automobile transportation by not considering the full costs of automobile use, such as vehicle ownership. Simple analysis tools help people recognize how much time and money they are spending on transportation and the cost of alternatives. Transportation cost tools can be effective for both businesses and individuals.

#### *Special Event Management*

South Lake Union park will host an increasing number of events in the future and will continue to be impacted by professional sporting events, concerts, and festivals held at Seattle Center. Managing travel demand to events can reduce impacts to South Lake Union. Actions include promoting the use of transit, carpooling (3 person plus in the future) and bicycling to events; providing additional transit service timed for event attendance; and restricting general purpose traffic during events. Event traffic restrictions can ensure that transit vehicles and HOVs have easy event ingress and egress.

#### *Marketing Programs*

In order to be successful, TDM efforts must have sustained marketing programs to keep encouragement levels high. These marketing efforts serve to remind existing non-SOV commuters of the wisdom of their choices. They also target employees, businesses, and residents who are new to the neighborhood. It is critical to reach these individuals and organizations with effective marketing during transition times.

### **Manage Parking**

Parking management is one of the most powerful tools available to manage transportation demand. Abundant commuter parking holds parking prices down, which encourages drive-alone trips that add to congestion and reduce overall mobility. Rather than promoting

parking development, TDM efforts should seek ways to minimize the amount of structured parking built as accessory to new SLU development. TDM efforts should also seek to use existing parking spaces in ways that maximize their economic growth potential.

Some parking management goals that support TDM are achievable through land use regulations:

- Reduce or eliminate minimum parking requirements (residential and non-residential uses)
- Adopt maximum parking space limits
- Bicycle Parking
  - Link bicycle parking requirements to land use (rather than a ratio of bicycle parking to automobile parking)
  - Develop requirements for short term and long-term bicycle parking.
  - Draft bicycle parking design guidelines (location, access, security, etc.)
- Limit on-site accessory parking and allow reduction in required off-site parking as transit service increases (to prevent over-development of structured parking).

Parking regulations that fit South Lake Union's current moderate transit service may not be appropriate for future conditions when transit service levels increase. With this in mind TDM programs should consider parking and land use regulations that support transition to a pedestrian-friendly, transit-oriented neighborhood. This may require tolerating and mitigating impacts of parking scarcity in the short-to-medium term rather than preventing parking scarcity.

Shared parking and *parking brokerage* are likely to be useful tools during South Lake Union's transition to a dense, mixed-use, urban neighborhood. Shared parking allows businesses with parking demands that occur at different times of the day to share a single facility. Similarly, parking brokerage can provide a way for owners of unused or under-used parking space to rent or trade space to other businesses or residents in the neighborhood.

On-street parking should also be regulated to prevent or discourage long-term, on-street, commuter parking.

### **Implementing TDM Programs:**

*Work with Businesses and Neighborhood Organizations to Build TDM Capacity and Advocacy within SLU.*

TDM efforts only succeed when jurisdictions, businesses, developers and transit service providers work toward common interests and goals. This can be accomplished in a number of ways.

#### *Commuter Trip Reduction Networks*

Existing business networks exist to promote TDM through Commuter Trip Reduction (CTR) programs. Employers with 100 or more peak-period commuters at a single work site are required by law to implement CTR programs. The City of Seattle contracts with King County Metro Transit to facilitate CTR programs in SLU.

### *Business Associations*

Because CTR programs are geared toward larger businesses the programs often do not reach small employers. Working through business associations is another way to reach more employers.

### *Neighborhood Organizations*

In mixed-use neighborhoods, working with residential and community organizations can support TDM strategies such as shared parking, car sharing, and ride sharing.

### *Transportation Management Associations*

Transportation Management Associations (TMAs) can provide a variety of parking management and TDM services to large and small businesses. Typical functions include ridesharing promotion and facilitation (ride matching and parking); bicycle promotion and bicycle parking programs; transit pass sales and distribution; and marketing to increase mode choice awareness.

New and expanded TDM programs should take advantage of existing networks and consider the development of new or expanded organizations or partnerships. For example, existing networks of commute trip reduction professionals already working in South Lake Union contain experience, knowledge, and creativity that might be effectively expanded to include smaller employers, or to provide services to non-traditional clients such as neighborhood organizations and residential buildings.

Regardless of the organizational model used, ongoing TDM efforts must be funded to be successful. Resources should be identified to provide staffing, space, administrative and program costs for a TDM service provider that can serve the entire neighborhood.

### *Consider Area-Wide Goals and Performance Monitoring*

Existing requirements for transportation management programs typically focused on a single development or building. It may be appropriate to consider area-wide performance standards over building-based or employer-based standards in a high growth neighborhood. Area-wide goals and monitoring will require an organization, such as a TMA, to monitor performance and adjust programs. This approach is likely to reduce the costs of compliance with land use requirements.

### *Collect and Maintain Data*

TDM programs will be more effective if they are based on good information and can be measured against objective and programmatic performance standards.

### *Mode Split Data*

Over the long term, success in managing transportation demand can be gauged in large part by mode split data. Choosing baseline data and measuring mode split at regular intervals will show progress and reveal shortcomings. Possible data for this effort include King County Metro's Rider Non-rider survey, commute trip reduction surveys (as required by CTR) and TMP surveys (as required by transportation management programs)

### *Parking Supply and Use Data*

Parking availability and price play a major role in mode choice. In order to effectively manage parking and implement TDM programs, SDOT should develop a comprehensive understanding of the existing parking supply, how it is used, anticipated changes to the parking supply, and the effects future development are likely to have on how future parking supply will be used. Periodic updates as redevelopment occurs should also be a priority.

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## **Traffic Analysis of Recommended Improvements**

Operational analyses were conducted to evaluate the traffic-related study recommendations with the projected growth in traffic volumes for the year 2030. The Synchro/SimTraffic analysis is not able to account for, or analyze, most non-motorized elements, but does include the effects of, and impacts on, additional pedestrians at new and existing intersections. The effects of the recommended transit and TDM elements on traffic volumes are also not incorporated into the traffic analysis forecasts. Therefore, the forecasted peak hour traffic volumes represent conservative traffic conditions, since potential reductions in SOV trips due to the TDM, transit, pedestrian and bicycle improvements are not fully captured. However, the Synchro/SimTraffic analysis does allow for a comparison of the relative differences between the Recommended Scenario and the Future Baseline (2030) network conditions.

Figures 8.14 and 8.15 graphically display the AM and PM peak-hour intersection turning movement volumes (respectively) for the Recommended Scenario. The LOS analysis results for the Future Baseline and Recommended Scenario are presented in Table 8.2.

In general, the analysis indicates that, compared to the Future Baseline case, a greater number of the study intersections are projected to experience some level of increased delay for the Recommended Scenario versus the number of intersections projected to experience a decrease in delay. Key locations where there is a notable increase in delay include the following:

- Broad/Valley Street and Westlake Avenue
- Mercer Street and 5<sup>th</sup> Avenue
- Mercer Street and Dexter Avenue (AM only)
- Roy Street and 5<sup>th</sup> Avenue
- Harrison Street and Dexter Avenue (AM only)

Delay increases at these intersections and other locations can be attributed to several factors ranging from reconfiguration of key arterials (lane geometry revisions) to changes in traffic patterns that take advantage of the enhanced street grid. The reconfiguration of Mercer Street and Westlake and Ninth Avenues from one-way to two-way operation would dramatically change the associated traffic patterns, volumes, signal timing characteristics, and progression quality for these streets. The two-way configuration would allow for easier, more direct access within and through the area, reducing travel distances and turning movements, but the improved access associated with the two-way configuration can result in increases in average delay at major intersections. With two-way operations, more complex signal timing patterns would be required to ensure reasonable one-way progression

particularly during heavy commute-period traffic conditions where a specific direction is emphasized (e.g. eastbound direction on Mercer Street during the PM peak).

The intersection of Mercer Street and Fifth Avenue would likely experience a higher delay with the Recommended Scenario. Level of Service at this intersection would degrade from B to E in the AM peak and from D to F in the PM peak. With the removal of Broad Street, this intersection will have westbound left turns conflicting with the eastbound movement on Mercer Street. The Thomas Street overpass at Aurora will accommodate some of the traffic that would otherwise use Broad Street, but a significant share is expected to use the new westbound route on Mercer. The Sixth Avenue connection over Mercer Street and a new connection at Mercer and Taylor will also help reduce traffic demand at Mercer and Fifth, and the full effect of these improvements may not be reflected in the forecasted volumes at this intersection. Additional crossing options on Aurora Avenue N. would also help relieve pressure at the Fifth and Mercer intersection.

In addition, the intersection of Broad Street at Fifth Avenue N. shows an increase in delay for the two-way Mercer scenario, likely due to the reconfiguration of the intersection and the signal connection to Fifth Avenue at Thomas Street. Both signals (Fifth/Broad and Fifth/Thomas) are assumed to operate on a single controller due to their close spacing. Additional analysis and design work in this area should continue with the AWV and Mercer Corridor Projects to help improve operations at this and the Mercer/Fifth intersections.

Two intersections that show a reduction in delay during the PM peak hour are Mercer Street at Dexter Avenue, and Harrison Street at Fairview Avenue. The intersection of Mercer Street at Dexter Avenue shows a reduction in overall delay primarily due to removal of the existing Aurora Avenue off-ramp approach (NW direction) and corresponding changes to the signal-phasing pattern. Delay reductions, at the intersection of Harrison Street and Fairview Avenue, result from removing the left-turn movement from Fairview Avenue onto Harrison Street, and the simplification of the signal operations as a result.

While more of the individual intersections analyzed for both the AM and PM peak hours are expected to experience some increase in delay with the Recommended Scenario in comparison to the Future Baseline Scenario, operational conditions system-wide (as indicated by the system average delay index) are expected to be relatively similar. The average system delay is an indicator of the average delay per vehicle traveling through the study area, incorporating the delays at the intersections listed in Table 8.2, as well as at other intersections. In the AM peak hour, the overall network average delay for the Recommended Scenario is slightly higher (7.2 minutes) than the Future Baseline Scenario (7.1 minutes), while in the PM peak hour, the overall network average delay for the Recommended Scenario is slightly lower (7.8 minutes) than the Future Baseline Scenario (8.0 minutes). Thus, while the average delays at some of the key intersections are projected to increase, the overall delay experienced within the study area is virtually unchanged between the Future Baseline and Recommended Scenarios.

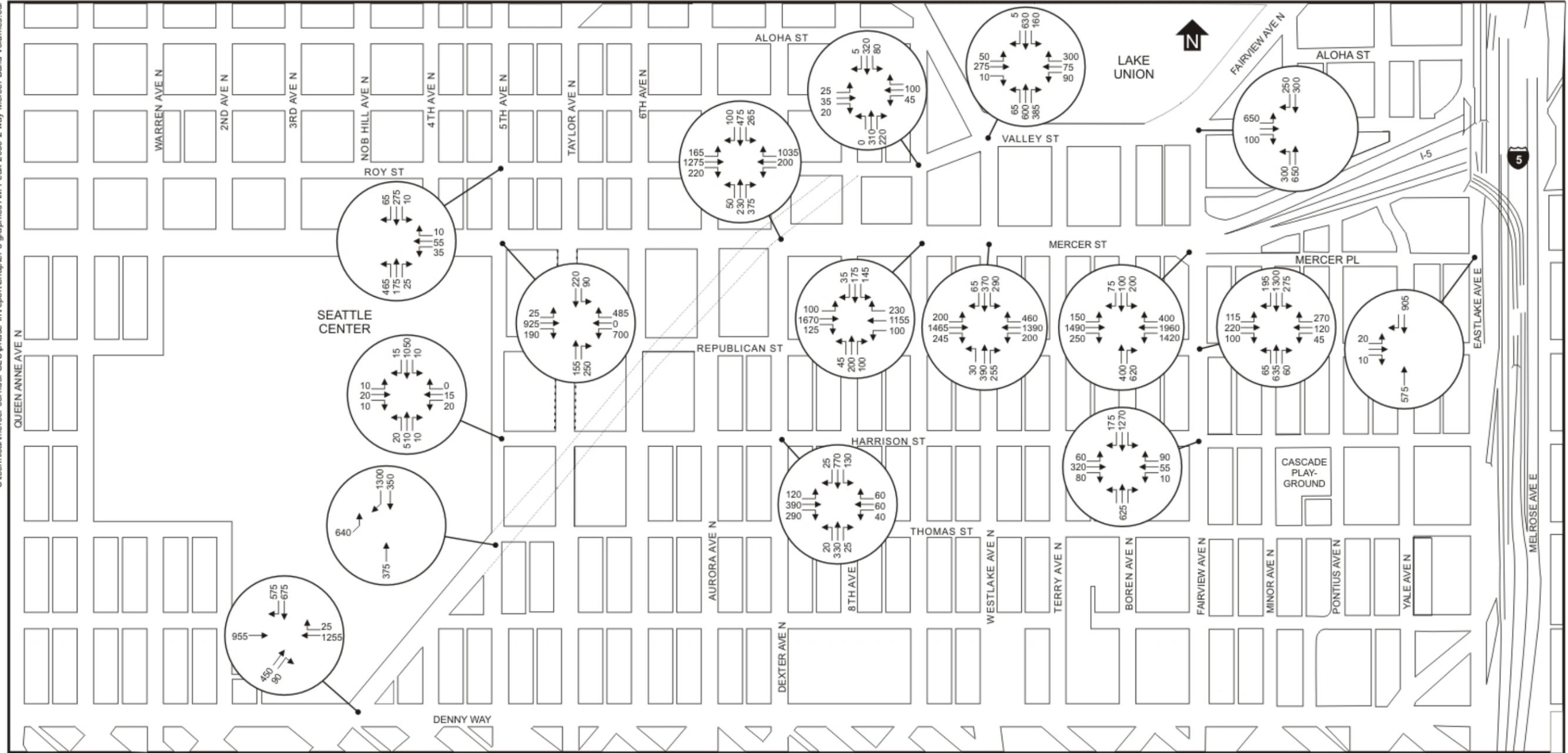


Figure 8.14: South Lake Union – 2030 Recommended Build Scenario AM Peak-Hour Intersection Volumes

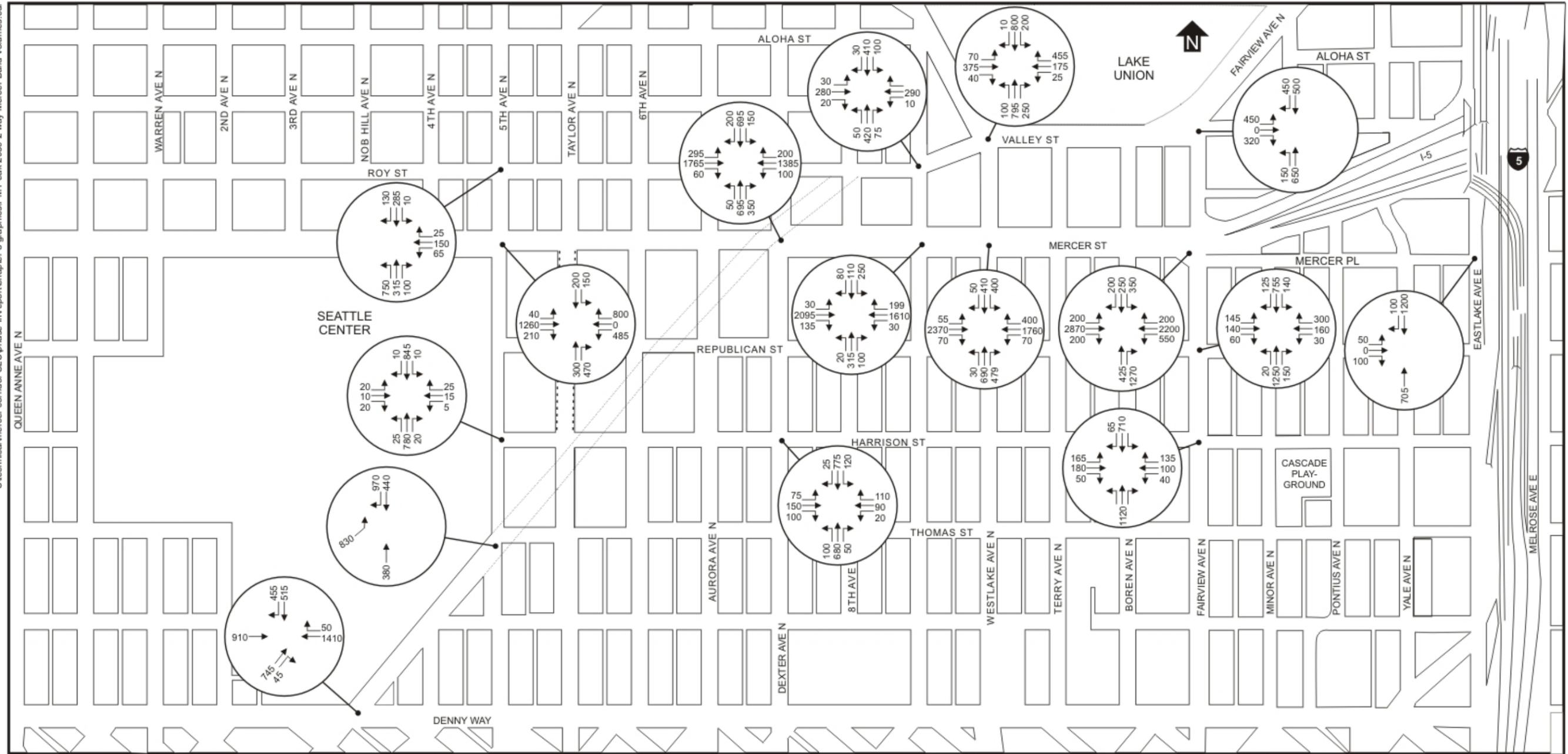


Figure 8.15: South Lake Union – 2030 Recommended Build Scenario PM Peak-Hour Intersection Volumes

**Table 8.2: AM and PM Peak Hour 2030 Future Baseline and Recommended Scenario Delay and LOS Summary**

ID	Cross Street 1	Cross Street 2	2030 Future Baseline				2030 Recommended Scenario			
			AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
9	Mercer Street	Westlake Avenue	33.4	C	37.6	D	34.0	C	52.6	D
10	Broad/Valley St	Westlake Avenue	12.2	B	25.6	C	57.5	E	62.7	E
14	Mercer Street	Fairview Avenue	57.9	E	53.8	D	50.3	D	58.0	E
17	Valley Street	Fairview Avenue	21.8	C	22.3	C	53.7	D	28.1	C
18	Fairview Avenue	I-5 Off-Ramp	6.6	A	10.2	B	---	---	---	---
27	Harrison Street	Fairview Avenue	13.3	B	52.6	D	13.6	B	74.8	E
28	5th Avenue	Broad Street	20.9	C	33.2	C	39.2	D	51.2	D
31	Roy Street	9th Avenue	39.3	D	43.7	D	59.8	E	60.0	E
32	Mercer Street	9th Avenue	26.7	C	29.1	C	42.4	D	44.8	D
36	Mercer Street	Dexter Avenue	59.0	E	>120	F	97.3	F	109.7	F
39	Harrison Street	Dexter Avenue	16.1	B	11.1	B	>100	F	18.6	B
57	Mercer Street	5th Avenue	26.1	C	44.3	D	63.6	E	83.6	F
58	Roy Street	5th Avenue	23.4	C	18.2	B	69.0	E	80.2	F
62	Harrison Street	5th Avenue	8.5	A	24.3	C	7.4	A	40.7	D
63	Harrison Street	Broad Street	7.6	A	11.0	B	---	---	---	---
65	Mercer Street	Eastlake Avenue	7.5	A	16.3	B	2.0	A	10.0	A
66	Denny Way	Broad Street	15.7	B	31.2	C	16.7	B	64.5	E
203	Republican Street	Fairview Avenue	29.8	C	59.1	E	30.0	C	66.6	E
<b>Total Network Delay (sec/veh)</b>			<b>424.6</b>		<b>478.5</b>		<b>433.4</b>		<b>469.5</b>	

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). Delays reported from SimTraffic microsimulation analysis (Synchro/SimTraffic V5 Build 323)

## Travel Time Summaries

Travel time estimates along a given route are another way of comparing the traffic operations performance of the Recommended Scenario to the Future Baseline Scenario. The travel time estimates incorporate the delays at each intersection along a given route, along with the distance traveled to provide a more comprehensive measurement of the travel experience, compared to looking at individual intersections. As described in this section, the Recommended Scenario is projected to result in improved travel times for two key routes – between I-5 and the north side of Seattle Center and between I-5 and the west side of Lake Union (Westlake and Aloha). Table 8.3 summarizes the Recommended Scenario AM and PM peak-hour travel times for key routes in the study area. In addition, Figures 8.16, 8.17, 8.18, and 8.19 show the actual travel paths and associated travel times for key routes in the study area as compared to the Future Baseline scenario.

During the AM peak hour, the following travel routes experience a decrease in travel time:

- WB – I-5 to North Side Seattle Center
- EB – North Side Seattle Center to I-5
- WB – I-5 to Westlake (via Westlake)
- EB – Westlake to I-5 - via 9th
- SB – Fairview Avenue
- NB – Dexter Avenue

During the PM peak hour, the following travel routes experience a decrease in travel time:

- EB – North Side Seattle Center to Fairview Avenue north of Valley Street
- EB – North Side Seattle Center to I-5
- EB – Westlake to I-5 - via 9th
- NB – Fairview Avenue
- SB – Fairview Avenue
- WB – I-5 to North Side Seattle Center
- WB – Fairview Avenue north of Valley Street to North Side Seattle Center

**Table 8.3: 2030 PM Peak Hour Travel Time Estimates for No Build and Build Scenarios**

	Path ID	Travel Path	2030 No-Build		2030 Build	
			AM	PM	AM	PM
<b>East-West Routes</b>	1	WB - I-5 to North Side Seattle Center	7.9 min	8.2 min	6.2 min	6.6 min
	2	EB – North Side Seattle Center to I-5	8.0 min	11.7 min	7.8 min	11.7 min
	3	WB - I-5 to South Side Seattle Center	6.4 min	5.8 min	8.0 min	7.6 min
	4	EB – South Side Seattle Center to I-5	7.6 min	7.9 min	10.9 min	20.4 min
	5	WB – Eastlake to North Side Seattle Center	6.1 min	6.6 min	7.1 min	5.9 min
	6	EB – North Side Seattle Center to Eastlake	5.4 min	9.7 min	8.6 min	13.2 min
	7	WB - I-5 to Westlake - <i>via Westlake</i> <i>via 9th</i>	4.0 min n/a	3.3 min n/a	<i>Westlake</i> 3.2 min <i>9th</i> 5.3 min	<i>Westlake</i> 4.2 min <i>9th</i> 6.4 min
	8	EB – Westlake to I-5 - <i>via 9th</i> <i>via Westlake</i>	7.8 min n/a	11.8 min n/a	<i>9th</i> 5.2 min <i>Westlake</i> 4.3 min	<i>9th</i> 5.5 min <i>Westlake</i> 6.8 min

	Path ID	Travel Path	2030 No-Build		2030 Build	
			AM	PM	AM	PM
<b>North-South Routes</b>	1	NB – Fairview Avenue	3.9 min	8.5 min	5.1 min	8.8 min
	2	SB – Fairview Avenue	8.0 min	10.1 min	5.5 min	3.8 min
	3	NB – Westlake Avenue	5.3 min	6.8 min	6.3 min	12.0 min
	3a	SB – Westlake Avenue		n/a	8.7 min	9.8 min
	4	SB - 9th Avenue	7.6 min	11.9 min	8.7 min	11.6 min
	4a	NB - 9th Avenue		n/a	9.0 min	10.8 min
	5	NB - Dexter Avenue	4.8 min	3.2 min	4.5 min	4.8 min
	6	SB - Dexter Avenue	4.4 min	5.3 min	5.6 min	6.0 min
7	WB – Eastlake to South Side Seattle Center	4.6 min	4.2 min	8.8 min	6.9 min	
8	EB – South Side Seattle Center to Eastlake	3.9 min	5.1 min	11.6 min	21.9 min	

System-wide Average Delay per Vehicle	425 secs (7.1 min)	479 secs (8.0 min)	433 secs (7.2 min)	470 secs (7.8 min)
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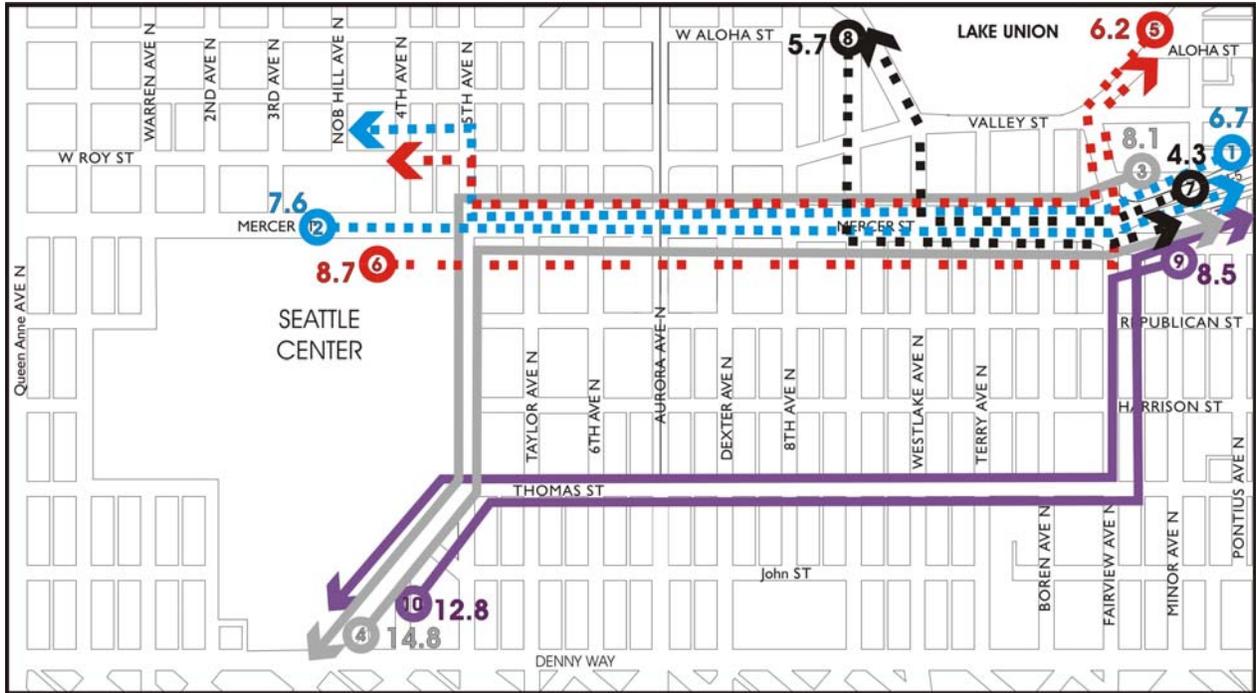
Ramp Queue Delay at I-5 & Fairview (WB)	100 secs (1.7 min)	83 secs (1.4 min)	69 secs (1.1 min)	86 secs (1.4 min)
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Figure 8.16: 2030 Recommended Improvement Scenario: East/West AM Peak-Hour Travel Times



Figure 8.17: 2030 Recommended Improvement Scenario: North/South AM Peak-Hour Travel Times



**Figure 8.18: 2030 Recommended Improvement Scenario:  
East/West PM Peak Travel Time Path Summaries**



**Figure 8.19: 2030 Recommended Improvement Scenario:  
North/South PM Peak Travel Time Path Summaries**

Compared to the Future Baseline scenario during the AM peak hour, the following travel routes experience an increase in travel time:

- EB – North Side Seattle Center to Fairview Avenue north of Valley Street
- NB – Fairview Avenue
- WB – Fairview Avenue north of Valley Street to North Side Seattle Center
- EB – South side Seattle Center to Fairview Avenue north of Valley Street
- EB – South side Seattle Center to I-5
- NB – Westlake Avenue
- SB – 9th Avenue
- SB – Dexter Avenue
- WB – Fairview Avenue north of Valley Street to South side Seattle Center
- WB – I-5 to south side Seattle Center

Compared to the Future Baseline scenario, the following travel routes experience an increase in travel time during the PM peak hour:

- EB – South side Seattle Center to Fairview Avenue north of Valley Street
- EB – South side Seattle Center to I-5
- NB – Dexter Avenue
- NB – Westlake Avenue
- SB – 9th Avenue
- SB – Dexter Avenue
- WB – Fairview Avenue north of Valley Street to South side Seattle Center
- WB – I-5 to South side Seattle Center
- WB – I-5 to Westlake Avenue (via Westlake Avenue)

Overall, east/west travel times between the north side of Seattle Center and either I-5 or the Eastlake community are moderately reduced with the Recommended Scenario, due to the provision of a direct westbound route and an emphasis on eastbound traffic flow in the signal coordination. Optimization of the eastbound direction was performed to maximize the capacity of the heaviest traffic stream on Mercer Street during the PM peak-hour period. However, travel times to and from the south side of Seattle Center increase considerably, most likely due to the elimination of the Broad Street diagonal route which today provides a more direct path to/from the Eastlake community and Mercer Street via the intersection of Fairview and Valley.

Travel time on Fairview Avenue decreases primarily due to the reconfiguration of lane striping in the northbound direction to provide a more conventional NB through lane at Mercer Street (as opposed to a through pocket in the No-Action scenario) as well as retiming of the Fairview Avenue signals to utilize the more efficient lane geometry. Also, removal of parking in the SB direction increased capacity from Mercer Street to Thomas Street.

Eastbound travel times from Westlake Avenue at Aloha Street to I-5 via either Ninth Avenue or Westlake Avenue also decrease considerably due to the dilution of southbound to eastbound left turn movements to two routes (Ninth Avenue and Westlake Avenue) vs. concentrating all movements to Ninth Avenue only and the removal of conflicting traffic

from Broad Street. This approach effectively minimized the amount of green time needed for traffic entering Mercer Street due to the "split" in left turn volume.

### **Summary of Traffic Operations**

The Recommended Scenario provides a number of traffic operational benefits for the SLU area while basically maintaining a comparable level-of-service for overall traffic movements. A two-way Mercer Street will provide better access within SLU as well as a more direct connection (particularly westbound) across Aurora Avenue N. to the north side of Seattle Center and the Queen Anne neighborhood, improving way-finding and street legibility. The conversion of Westlake Avenue N. and Ninth Avenue N. from one-way to two-way streets, likewise, is expected to improve local access and circulation within SLU, without compromising operations for through traffic. Overall, the major east-west and north-south routes are expected to experience similar or better travel times, except for the routes that previously would have used Broad Street (i.e., routes from the south side of the Seattle Center to either the Eastlake community or I-5 at Mercer Street).

Traffic operations is only one way of measuring the performance of the transportation system. This study also focused on a number of other transportation objectives such as improving the pedestrian and bicycle connections, improving transit mobility and accessibility, and facilitating access to open space. An overarching objective of this study was to develop a system that would successfully facilitate the improvement of these alternate modes of travel, while maintaining automobile traffic operations. The design of the roadway system needs to be balanced with these other objectives; in fact, most of the recommendations for the arterial street system are necessary to achieve these objectives.

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### **Benefits of the Recommended Improvement Scenario**

The Recommended Scenario for the SLU area was developed through many months of technical analyses as well as interaction with and feedback from the area stakeholders. This report documents this process, and in so doing outlines many of the anticipated benefits of the recommendations. The primary benefits of the Recommended Scenario for the SLU area can be summarized as follows:

- Provides better access and mobility for people and goods throughout South Lake Union with easier, more direct connections via the two-way street grid
- Improves safety and mobility for pedestrians and bicyclists in the Mercer Corridor
- Provides new and improved connection for all modes between SLU and Queen Anne, Downtown, and Capitol Hill
- Represents an overall improvement to regional access for all modes
- Provides direct east-west and north-south freight connections within and through South Lake Union
- Enhances SLU neighborhood livability and economic vitality

While the existing system is focused on pushing as many vehicles through the neighborhood as quickly as possible, the Recommended Scenario maintains or improves these inter-neighborhood connections while also better serving the South Lake Union neighborhood.

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## Conceptual Cost Estimates

The conceptual cost estimates for the South Lake Union Transportation Study improvement alternatives were assembled on an individual pay item basis in accordance with the written description of the alternative. Because the improvement alternatives are currently at a conceptual design level, the estimates utilize a range of contingencies with the understanding that these monies are likely required for each project, but as the level of design becomes more specific, individual project allocations will change based on better project understanding and more detailed design.

Once pay items were identified, a limited number of sources were used to assign costs. These sources were: WSDOT UBA (Unit Bid Analysis), COS UBP (Unit Bid Price) PB Civil Group Cost resources, PB Traffic Group cost resources, the Alaskan Way Viaduct and Seawall Replacement Project (AWVSRP) estimates, and R.S. Means Heavy Construction Cost Data 2003. In addition, pay items for which our sources yielded a variety of figures, were reviewed by the study team and assigned a reasonable cost.

Mobilization was the only pay item within the raw cost or "above the line" estimate that used a percentage of the total and was 10 percent for all estimates. Mobilization covers contractor setup costs such as hiring of sub-contractors and preparation of the site. After identifying the raw cost, one of four multipliers was used to cover taxes, engineering, and general contingency. A smaller multiplier was used for smaller projects and a larger multiplier was used for larger or more complex projects. This was because smaller projects typically had a higher level of design at the time of the estimate, compared with larger projects for which the same level of necessary raw cost pay items had not yet been identified. All costs were calculated in year 2004 dollars.

In two cases conceptual cost estimates were developed that deviated from the described methodology. This was in the case of the Two-Way Mercer Street/Narrow Valley Street, Roy Street Underpass/Fairview Avenue N. and Valley Street realignment estimates. The Two-Way Mercer Street/Narrow Valley Street estimates were developed as part of the South Lake Union Phase II work and were developed in accordance with cost estimating procedures used for the AWVSRP. Costs for the Two-Way Mercer/Narrow Valley Street estimate were completed with a high and a low range and are shown in Table 8.4.

Costs for the Roy Underpass and the Fairview Avenue/Valley Street realignment were estimated and documented previously in the South Lake Union Transportation Improvements Project Final Report, July 2002. These two estimates were analyzed for reasonableness and given a 3 percent annual escalation over two years to bring the raw costs up to year 2004 costs prior to the application of a multiplier.

Finally, conceptual cost estimates for AWVSRP concepts were received directly from the AWVSRP team. Cost estimates for the AWVSRP items are in year 2002 dollars (as noted) and include contingencies, however, they do not include costs associated with the implementation of a flexible transportation program (unlike other AWVSRP cost estimates) and are more representative of a stand alone project.

Table 8.4 details the conceptual cost estimates developed for the proposed elements of the recommended improvement scenario. The low and high range in Table 8.4 applies only to the Two-Way Mercer/Narrow Valley concepts. All other improvements have a single cost estimate. Appendix B contains the build-up for raw cost estimates, associated unit costs and source data.

As developed, the total conceptual cost estimate for the Recommended Improvement Scenario is approximately \$245 to \$258 million for the entire study area. Of that total, \$131 to \$144 million is for projects within South Lake Union. The remaining cost is divided among the following: connections across Aurora (AWVSRP), building the street grid west of Aurora Avenue/SR 99, pedestrian and bicycle connection on the eastern edge of the study area, and a share of the streetcar and new trolley route in adjacent areas served by those routes (Denny Triangle for the Streetcar; Uptown and North Capitol Hill for the trolley route).

**Table 8.4: Conceptual Cost Estimates for Recommended Improvement Scenario**

AUTO TRAFFIC CONCEPTS	COST COMMENTS	CONCEPTUAL COST ESTIMATE (2004 dollars)
<b>Two-Way Mercer/Narrow Valley</b>		
Mercer from Fairview to Dexter Avenue - 2-Way (currently eastbound only with westbound traffic using Valley/Broad), 6 lanes plus median & left-turn lanes; 4th eastbound lane between Boren and Fairview Avenues (approach to I-5). Phase II cost estimates were completed as a range (low and high), the SLU Transportation Study chose to use the high range.	Cost estimates completed as part of the previous SLU Transp. Study Phase II work.	\$65,000,000 - \$74,000,000
Mercer from Dexter to 5th Avenue - 2-Way (currently eastbound only with westbound traffic using Broad), 6 lanes plus median & left-turn lanes (includes widened Mercer Street underpass)	AWVSRP (2002 dollars) Modify Mercer Street (and underpass) from Dexter to 5th to include 6 lanes, a median, left-turn lanes, and pedestrian/bike facilities (city owned property/right-of-way is needed for the widening, no costs have been included for this).	\$23,000,000
Valley St From Fairview to Westlake - 2-lane w/ left turn lanes and bike lanes. Phase II cost estimates were completed as a range (low and high), the SLU Transportation Study chose to use the high range.	Cost estimates completed as part of the previous SLU Transp. Study Phase II work.	\$17,000,000 - \$21,000,000
Roy Street from Westlake to Dexter - rebuild as 2-way (currently wb only), 2 lanes plus left-turn lanes and bike lanes (continuity with Valley Street east of Westlake) & 8th Ave between Mercer and Roy - new street	Rebuild Roy after Broad Street removal to accommodate one 11' lane in each direction, two 8' parking lanes, an 11' turn-lane, 20' LTB Trail/sidewalk, two 5' bike lanes and one 10' sidewalk and rebuild 8th (one 12' lane in each direction and one 8' parking lane in each direction and 16' sidewalks) between Mercer and Roy Streets.	\$2,420,000
Broad St from 5th Ave to 9th Ave - Remove and fill to re-create street grid east and west of Aurora Avenue	AWVSRP (2002 dollars) Demolition of existing structure at Broad and remove existing bridge over Broad Street, fill in Broad from 5th to 8th St, resurfacing of affected portion of Mercer Street, connect Harrison from Taylor to 6th at grade two lanes, connect Taylor from Thomas to Harrison, and connect Thomas from 5th to 6th Avenues.	\$30,000,000
Dexter Avenue and Republican Street - Signal	Addition of a signal and associated striping.	\$250,000
<b>Mercer/Fairview/I-5 Ramps</b>		
Fairview Avenue NB approach to I-5 - add NB left-turn pocket at Mercer Street (with 2-way Mercer) and NB right-turn lane (approx. 1/2 way between Harrison & Republican), and improve signage on NB Fairview Avenue approach to I-5 on ramps.		\$430,000
Reconfigure on-ramp approach to accommodate all four lanes of traffic from Mercer (part of Two-way Mercer project)	Included with 2-Way Mercer	
<b>New Connections Across Aurora</b>		
Thomas Street from Sixth to Dexter - Overpass of SR-99 (Optional: Harrison instead of Thomas)	AWVSRP (2002 dollars) Cost estimate is for a 40' structure, estimated by AWVSRP. The SLU Study Team recommends increasing the structure width to 50' in order to include bike lanes. The conceptual cost estimate is likely to accommodate the increase, but selection of Thomas or Harrison Street is not yet clear and additional clarification/design is required (does not include right-of-way costs).	\$21,000,000
Thomas St from Fairview to 5th Ave - Add center left-turn lane (Optional: Harrison instead of Thomas)	Re-stripe 2400' from 2 lanes to 2 thru lanes with left-turn pockets and arrows and 3 new signals	\$750,000
Mercer - Widen underpass across Aurora (part of Mercer Dexter to 5th)	Included with Widen Mercer	

**Table 8.4 (continued)**  
**Conceptual Cost Estimates for Recommended Improvement Scenario**

AUTO TRAFFIC CONCEPTS	COST COMMENTS	CONCEPTUAL COST ESTIMATE (2004 dollars)
<b>Build Street Grid West of Aurora - Part of Alaskan Way Viaduct Project</b>		
6th Ave from Roy to Harrison - overpass of Mercer St to provide new N-S arterial connection from Queen Anne to Denny Way.	Structure is assumed to be 52' (two 12' travel lanes, two 8' sidewalks, two 4' bike lanes and 2' of retaining-wall/structure) wide and 550' long. Surface street is 1 lane in each direction (12' wide), an 8' parking lane in each direction, and 10' sidewalks in each direction and 500' long.	\$13,500,000
Taylor Ave - Signal at Mercer and extend Taylor Ave from Mercer to Harrison St.	66' cross-section (SB 8' sidewalk, 8' pkg, 5' bike, 12' travel, NB 12' travel, 5' bike 8' pkg, 8' sidewalk) for 1100'	\$1,700,000
Republican from Aurora to 5th Ave N - new 2-lane street	60' cross-section (EB 10' sidewalk, 8' pkg, 12' travel, WB 12' travel, 8' pkg, 10' sidewalk) for 850'	\$1,020,000
<b>Two-way traffic on 9<sup>th</sup> and Westlake</b>		
Westlake Ave (4-5 lanes) and 9th Ave (3-lanes) from Aloha St to Denny - Two-way from Aloha to Denny (currently 4 lanes nb on Westlake and 3 lanes sb on 9th)		\$835,000
<b>Eastlake Avenue</b>		
Eastlake near Denny - add SB U-turn for access to northbound I-5 express lanes.	Signal and 4 lane stripes over 150 feet.	\$250,000
Eastlake & Thomas - Signal		\$250,000
Eastlake & Republican - Signal		\$250,000

BICYCLE CONCEPTS	COMMENTS	CONCEPTUAL COST ESTIMATE (2004 dollars)
<b>Improve Around-the-Lake Bike Facilities</b>		
Fairview between Eastlake Ave and Valley St - add bike lanes by rerstriping from 4/5 to 3 lanes (includes signal at Yale Ave).	Rerstripe Fairview from a 5 to a 3 lane roadway with bike lanes in each direction for 12,000'	\$275,000
Fairview and Fairview (near Eastlake) - modify intersection for bike/ped access and safety	Modify intersection striping, lane channelization and signage	\$1,200,000
<b>Bike Routes</b>		
Sign Lakeview Boulevard (across I-5) as a Bicycle Route	Install 5 bike route signs (2'x2' wood on 4"x4" post)	\$1,000
Sign bike route on Eastlake Avenue E (E Garfield to Denny) for bicycle commuters.	Install 10 bike route signs (2'x2' wood on 4"x4" post)	\$2,000
Sign bike-routes on streets noted as "commonly used" in the SDOT Bicycle Guide Map	Install 30 2'x2' signs	\$6,000
<b>Maintain/Improve Dexter as a north/south bicycle corridor</b>		
Sign bike route from Dexter bike lanes to 2nd Avenue bike lanes and proposed bike lanes on 4th Avenue (Center City Circulation Report) via Blanchard & Bell	11 city blocks on 2 different streets (Battery and Bell) for a total of approximately 10 signs	\$2,000
<b>Improve bicycle connections across SR 99/Aurora</b>		
Incorporate Lake-to-Bay Trail concepts into the Mercer Corridor Project (costs include trail facilities from Dexter & Mercer to 5th & Thomas. Other costs included with Two-Way Mercer/Narrow Valley).	Construct Lake-to-Bay Trail from Mercer & Dexter to 5th & Thomas as part of the proposed AWW Widen Mercer Underpass Option.	\$760,000

**Table 8.4 (continued)**  
**Conceptual Cost Estimates for Recommended Improvement Scenario**

PEDESTRIAN CONCEPTS	COMMENTS	CONCEPTUAL COST ESTIMATE (2004 dollars)
<b>Terry Avenue N Design</b> - Pedestrian improvements (sidewalk on west side, curbless pedestrian space on east side), remove railroad tracks.	As frontage improvements with development	N/A
<b>Eighth Avenue</b> - Pedestrian street	As frontage improvements with development	N/A
<b>Cascade Neighborhood Pedestrian Improvements</b>		
Repair and improve sidewalks throughout South Lake Union.	Assumed included in existing SDOT sidewalk maint. & repair budget	
Thomas & Harrison between Fairview and Eastlake - Address uncontrolled intersections and traffic to provide consistent traffic control and improved pedestrian crossings (up to 16 stop signs)	Assume up to 16 stop signs at \$300/sign and associated striping	\$8,000
Harrison, Minor & Pontius around Cascade Park - widen sidewalks	Widen 2 block faces at 400' and 1 block face at 300' by 2' of sidewalk.	\$140,000
Harrison Street - Wider sidewalks and curb bulbs	Incl. In "Sidewalks and Curb Bulbs" (below)	
Thomas Street - curb bulbs	Incl. In "Sidewalks and Curb Bulbs" (below)	
<b>Sidewalks and Curb Bulbs</b>		
Harrison Street, between Yale and Dexter - widen sidewalks	Widen north & south sidewalks by 2 feet -- reducing travel lanes from 14' to 12'.	\$1,910,000
Harrison between Yale and Dexter Avenues - curb bulbs on all 4 corners	A total of 35 full curb bulbs and 5 half bulbs.	\$1,300,000
Thomas between Yale and Dexter Avenues - curb bulbs on all 4 corners	A total of 17 full curb bulbs and 9 half bulbs.	\$810,000
John at Fairview & Westlake - curb bulbs on all 4 corners	A total of 4 full curb bulbs and 4 half bulbs.	\$240,000
Republican at Fairview, Terry, Westlake & Dexter - curb bulbs on all 4 corners	A total of 7 full curb bulbs and 8 half bulbs.	\$450,000
Eastlake at Aloha - curb bulb on Eastlake Avenue E at Aloha Street (possible crosswalk striping)	A total of 2 half bulbs	\$54,000
<b>Improve Denny Way Pedestrian Environment and Crossing of I-5</b>		
Denny Way I-5 crossing - add 10' sidewalk		\$2,750,000
Denny between Stewart and Dexter Avenue - Add curb bulb-outs and countdown signals at signalized intersections	Install countdown signals on Denny and curb bulbs on five side-street crossings.	\$580,000

**Table 8.4 (continued)**  
**Conceptual Cost Estimates for Recommended Improvement Scenario**

TRANSIT CONCEPTS	COMMENTS	CONCEPTUAL COST ESTIMATE (2004 dollars)
<b>Transit emphasis/transit priority street on Fairview Ave N</b>		
Fairview Avenue at Denny Way - add NB & SB Transit Signal Priority (TSP).	TSP hardware for NB & SB operations	\$110,000
Fairview Avenue at Harrison Street - NB queue jump and SB TSP	TSP hardware for NB & SB operations	\$110,000
Fairview Avenue at Mercer Street - NB and SB TSP.	TSP hardware for NB & SB operations	\$110,000
Fairview Avenue at Valley Street - NB and SB TSP	TSP hardware for NB & SB operations	\$110,000
<b>SLU Streetcar</b> (Westlake Center to FHCRC (Yale Ave) on Westlake via Westlake/Valley/Terry.)	Streetcar Study	\$45,000,000
<b>New Bus Route (Trolley or Other Electric Technology) Uptown to N. Capitol Hill via Mercer or Republican</b>	Trolley wire and infrastructure for New route from Queen Anne & Mercer to Broadway/10th & Belmont via Republican & Lakeway. Does not include O&M costs	\$11,700,000
<b>Bus Shelters</b>		
Install transit bus shelters along bus routes in study area (9)	Install a total of 9 shelters at approximately \$18,000/shelter	\$165,000
Include appropriate lighting at shelters	Assume 2 lights at \$2,000 each (includes material and labor)	\$70,000
<b>Total Cost - Capital</b> (rounded to nearest \$100K)		<b>\$245,518,000 - \$258,518,000</b>
<b>Area / Project Allocation</b>		
<b>Alaskan Way Viaduct Project Total</b> (Mercer: Dexter-Fifth, Thomas Over, Broad)		<b>\$74,000,000</b>
<b>West Total</b> (Street Grid West of Aurora, 35% of Uptown-N Capitol Hill Trolley)		<b>\$20,315,000</b>
<b>East Total</b> (Fairview/Fairview Bike/Ped, Denny Sidewalk over I-5, 25% of Uptonw-N Capitol Hill Trolley)		<b>\$6,875,000</b>
<b>South/Denny Triangle</b> (30% of Streetcar)		<b>\$13,500,000</b>
<b>South Lake Union Total</b>		<b>\$130,578,000 - \$143,828,000</b>

Because many of the recommendations provide benefits to more than one mode, the SLU project team determined the modal breakdown cost for each proposed project element. Modal breakdown costs were developed by determining the approximate amount of the total cost that is related to pedestrian, bicycle or traffic uses (e.g. sidewalks count towards pedestrian use, bike lanes count towards bicycle use, and parking or travel lanes count towards auto traffic use). The specific pedestrian, bicycle and transit project elements generally counted only towards those modes, except in the case of the Lake-to-Bay Trail, which was counted half towards pedestrian use and half to bicycle use. Table 8.5 details the modal breakdown of each project element of the Recommended Improvement Scenario.

Approximately one-half (or \$125 million) of the conceptual infrastructure costs are for auto-related improvements; approximately 25 percent of the total cost (or \$64 million) are related to pedestrian uses; roughly 22 percent of the conceptual cost is estimated to be for transit infrastructure; and approximately 5 percent (or \$12 million) of the conceptual cost estimate is related to bicycle infrastructure.

**Table 8.5: Modal Cost Breakdown by Project Element**

AUTO TRAFFIC CONCEPTS	PEDESTRIAN	BICYCLE	TRAFFIC	TRANSIT
<b>Two-Way Mercer/Narrow Valley</b>				
Mercer from Fairview to Dexter Avenue - 2-Way (currently eastbound only with westbound traffic using Valley/Broad), 6 lanes plus median & left-turn lanes; 4th eastbound lane between Boren and Fairview Avenues (approach to I-5). Phase II cost estimates were completed as a range (low and high), the SLU Transportation Study chose to use the high range.	\$ 21,300,000		\$ 52,700,000	
Mercer from Dexter to 5th Avenue - 2-Way (currently eastbound only with westbound traffic using Broad), 6 lanes plus median & left-turn lanes (includes widened Mercer Street underpass)	\$ 6,670,000		\$ 16,330,000	
Valley St From Fairview to Westlake - 2-lane w/ left turn lanes and bike lanes. Phase II cost estimates were completed as a range (low and high), the SLU Transportation Study chose to use the high range.	\$ 7,770,000	\$ 2,520,000	\$ 10,710,000	
Roy Street from Westlake to Dexter - rebuild as 2-way (currently wb only), 2 lanes plus left-turn lanes and bike lanes (continuity with Valley Street east of Westlake) & 8th Ave between Mercer and Roy - new street	\$ 726,000	\$ 363,000	\$ 1,331,000	
Broad St from 5th Ave to 9th Ave - Remove and fill to re-create street grid east and west of Aurora Avenue	\$ 8,600,000		\$ 21,400,000	
Dexter Avenue and Republican Street - Signal			\$ 250,000	
<b>Mercer/Fairview/I-5 Ramps</b>				
Fairview Avenue NB approach to I-5 - add NB left-turn pocket at Mercer Street (with 2-way Mercer) and NB right-turn lane (approx. 1/2 way between Harrison & Republican), and improve signage on NB Fairview Avenue approach to I-5 on ramps.			\$ 430,000	
Reconfigure on-ramp approach to accommodate all four lanes of traffic from Mercer (part of Two-way Mercer project)				
<b>New Connections Across Aurora</b>				
Thomas Street from Sixth to Dexter - Overpass of SR-99 (Optional: Harrison instead of Thomas)	\$ 6,300,000	\$ 4,200,000	\$ 10,500,000	
Thomas St from Fairview to 5th Ave - Add center left-turn lane (Optional: Harrison instead of Thomas)			\$ 750,000	
Mercer - Widen underpass across Aurora (part of Mercer Dexter to 5th)				

**Table 8.5 (continued)**  
**Modal Cost Breakdown by Project Element**

AUTO TRAFFIC CONCEPTS	PEDESTRIAN	BICYCLE	TRAFFIC	TRANSIT
<b>Build Street Grid West of Aurora - Part of Alaskan Way Viaduct Project</b>				
6th Ave from Roy to Harrison - overpass of Mercer St to provide new N-S arterial connection from Queen Anne to Denny Way.	\$ 4,050,000	\$ 2,700,000	\$ 6,750,000	
Taylor Ave - Signal at Mercer and extend Taylor Ave from Mercer to Harrison St.	\$ 408,000	\$ 255,000	\$ 1,037,000	
Republican from Aurora to 5th Ave N - new 2-lane street	\$ 340,000		\$ 680,000	
<b>Two-way traffic on 9<sup>th</sup> and Westlake</b>				
Westlake Ave (4-5 lanes) and 9th Ave (3-lanes) from Aloha St to Denny - Two-way from Aloha to Denny (currently 4 lanes nb on Westlake and 3 lanes sb on 9th)			\$ 835,000	
<b>Eastlake Avenue</b>				
Eastlake near Denny - add SB U-turn for access to northbound I-5 express lanes.			\$ 250,000	
Eastlake & Thomas - Signal			\$ 250,000	
Eastlake & Republican - Signal			\$ 250,000	

BICYCLE CONCEPTS	PEDESTRIAN	BICYCLE	TRAFFIC	TRANSIT
<b>Improve Around-the-Lake Bike Facilities</b>				
Fairview between Eastlake Ave and Valley St - add bike lanes by rerstriping from 4/5 to 3 lanes (includes signal at Yale Ave).		\$ 275,000		
Fairview and Fairview (near Eastlake) - modify intersection for bike/ped access and safety		\$ 1,200,000		
<b>Bike Routes</b>				
Sign Lakeview Boulevard (across I-5) as a Bicycle Route		\$ 1,000		
Sign bike route on Eastlake Avenue E (E Garfield to Denny) for bicycle commuters.		\$ 2,000		
Sign bike-routes on streets noted as "commonly used" in the SDOT Bicycle Guide Map		\$ 6,000		
<b>Maintain/Improve Dexter as a north/south bicycle corridor</b>				
Sign bike route from Dexter bike lanes to 2nd Avenue bike lanes and proposed bike lanes on 4th Avenue (Center City Circulation Report) via Blanchard & Bell		\$ 2,000		
<b>Improve bicycle connections across SR 99/Aurora</b>				
Incorporate Lake-to-Bay Trail concepts into the Mercer Corridor Project (costs include trail facilities from Dexter & Mercer to 5th & Thomas. Other costs included with Two-Way Mercer/Narrow Valley).	\$ -	\$ 760,000		

**Table 8.5 (continued)**  
**Modal Cost Breakdown by Project Element**

PEDESTRIAN CONCEPTS	PEDESTRIAN	BICYCLE	TRAFFIC	TRANSIT
<b>Terry Avenue N Design</b> - Pedestrian improvements (sidewalk on west side, curbless pedestrian space on east side), remove railroad tracks.				
<b>Eighth Avenue</b> - Pedestrian street				
<b>Cascade Neighborhood Pedestrian Improvements</b>				
Repair and improve sidewalks throughout South Lake Union.				
Thomas & Harrison between Fairview and Eastlake - Address uncontrolled intersections and traffic to provide consistent traffic control and improved pedestrian crossings (up to 16 stop signs)	\$ 8,000			
Harrison, Minor & Pontius around Cascade Park - widen sidewalks	\$ 140,000			
Harrison Street - Wider sidewalks and curb bulbs				
Thomas Street - curb bulbs				
<b>Sidewalks and Curb Bulbs</b>				
Harrison Street, between Yale and Dexter - widen sidewalks	\$ 1,910,000			
Harrison between Yale and Dexter Avenues - curb bulbs on all 4 corners	\$ 1,300,000			
Thomas between Yale and Dexter Avenues - curb bulbs on all 4 corners	\$ 810,000			
John at Fairview & Westlake - curb bulbs on all 4 corners	\$ 240,000			
Republican at Fairview, Terry, Westlake & Dexter - curb bulbs on all 4 corners	\$ 450,000			
Eastlake at Aloha - curb bulb on Eastlake Avenue E at Aloha Street (possible crosswalk striping)	\$ 54,000			
<b>Improve Denny Way Pedestrian Environment and Crossing of I-5</b>				
Denny Way I-5 crossing - add 10' sidewalk	\$ 2,750,000			
Denny between Stewart and Dexter Avenue - Add curb bulb-outs and countdown signals at signalized intersections	\$ 580,000			
<b>TRANSIT CONCEPTS</b>	<b>PEDESTRIAN</b>	<b>BICYCLE</b>	<b>TRAFFIC</b>	<b>TRANSIT</b>
<b>Transit emphasis/transit priority street on Fairview Ave N</b>				
Fairview Avenue at Denny Way - add NB & SB Transit Signal Priority (TSP).				\$ 110,000
Fairview Avenue at Harrison Street - NB queue jump and SB TSP				\$ 110,000
Fairview Avenue at Mercer Street - NB and SB TSP.				\$ 110,000
Fairview Avenue at Valley Street - NB and SB TSP				\$ 110,000
<b>SLU Streetcar</b> (Westlake Center to FHCRC (Yale Ave) on Westlake via Westlake/Valley/Terry.)				\$ 45,000,000
<b>New Bus Route (Trolley or Other Electric Technology) Uptown to N. Capitol Hill via Mercer or Republican</b>				\$ 11,700,000
<b>Bus Shelters</b>				
Install transit bus shelters along bus routes in study area (9)				\$ 165,000
Include appropriate lighting at shelters				\$ 70,000
<b>Total Cost - Capital</b> (rounded to nearest \$100K)	<b>\$64,400,000</b>	<b>\$12,300,000</b>	<b>\$124,500,000</b>	<b>\$57,400,000</b>

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## Operating Costs for New or Enhanced Transit Routes

Working in conjunction with King County Metro, the SLU Transportation Study team developed annual bus and operating cost estimates for the proposed transit service improvements. Table 8.6 details the new transit route and service improvements recommended by the SLU Transportation Study.

Approximately 29 new buses would be required to provide the proposed service improvements recommended by the SLU Transportation Study. Annual bus costs were developed using an assumed 12 year life per transit coach at an assumed total cost of \$530,000 per coach. Capital costs for the streetcar are included in Table 8.4 and are not repeated here. To estimate annual bus operating costs service hours were estimated using the following assumptions:

- 1 hour per round trip
- Peak hours - 4 hours/day, 15 minute headways
- Off peak hours - 15 hours/day, 30 minute headways
- Weekends – 1 trip every hour (60 minute headways)

The proposed improvements are grouped into near-term, mid-term and long-term strategies, since service improvements would be implemented over time as growth occurs in SLU, the Denny Triangle and adjacent neighborhoods. Implementation of transit service will be phased and coordinated with King County Metro. Specific service recommendations, especially in out years, could vary, but the table provides a general estimate of the likely costs over time.

The near-term service improvements include the SLU Streetcar, direct service from Northgate, increased frequency on the Route 8, and consolidating SLU-destined routes on downtown Streets. The estimated annual bus and operating cost for these service improvements is \$3,020,000.

Mid-term service improvements include new service between North Capitol Hill and Uptown via Mercer or Republican and increased frequency on the SLU Streetcar and the Route 70. Note that frequency on the route 70 might not be increased if the streetcar is extended to the University District. The estimated annual bus and operating cost for the mid-term improvements would be an additional \$4,550,000.

Long-term service improvements are represented here by direct service from three suburban park and ride lots. The total annual bus and operating cost for these routes would be \$1,470,000, for a total of \$9,040,000 for all service improvements in Table 8.6.

**Table 8.6: Annual Bus Operating Costs**

	Annual Bus Cost	Annual Service Hour Cost	Annual Operating Costs
<b>Near-Term</b>			<b>\$ 3,020,000</b>
SLU Streetcar 15 minute headways*	\$ -	\$ 1,400,000	\$ 1,400,000
Northgate park and ride direct service	\$ 192,214	\$ 408,000	\$ 600,000
Re-route Downtown/SLU service	\$ -	\$ 240,000	\$ 240,000
Increase frequency on Route 8	\$ 96,106	\$ 688,000	\$ 780,000
<b>Mid-Term (includes near-term)</b>			<b>\$ 7,570,000</b>
Increase SLU Streetcar frequency to 10 minute headways	\$ -	\$ 700,000	\$ 700,000
Uptown-Capitol Hill Route	\$ 384,426	\$ 1,770,640	\$ 2,160,000
Increase frequency on Route 70	\$ 384,426	\$ 1,304,000	\$ 1,690,000
<b>Long-Term (includes near and mid-term)</b>			<b>\$ 9,040,000</b>
Service to/from Star Lake park and ride	\$ 192,214	\$ 456,000	\$ 650,000
Service to/from Burien park and ride	\$ 192,214	\$ 416,000	\$ 610,000
Service to/from Issaquah and Eastgate park and ride	\$ 48,054	\$ 162,560	\$ 210,000

\*Streetcar capital costs are included in Table 8.4

### Operating Costs for Travel Demand Management Programs

In addition to the recommended physical improvement and transit service costs, recommended TDM programs will require ongoing funding to make the most effective use of the improvements. Transportation demand management costs typically include staffing, office space, administrative costs and promotions for a small organization dedicated to TDM efforts. These organizations are typically financed through district wide assessments and seek additional financial support through grants. Total annual cost for an optimal TDM program in SLU is estimated to be \$419,500.

### Implementation Strategy

Table 8.7 outlines suggested implementation priorities for each of the individual improvement projects contained in the overall Recommended Scenario package. The priorities are listed as either immediate action, near-term, mid-term, or long-term. Funding availability could change the time-frame associated with specific projects.

Immediate action priorities are those that would provide positive benefits and have a high potential to be implemented with existing resources because of their low costs, or implemented as part of existing programs.

Near-term priority improvements are considered to be those that could be implemented within the next one to three years and exhibit the following characteristics:

- They are relatively low-cost;
- They have independent and immediate benefits; and
- They require some time to be programmed into the City's TIP process

Mid-term priority improvements are those that would be implemented within a three- to ten-year time frame and exhibit the following characteristics:

- They are either of moderate cost and would provide reasonable benefit, or;
- They are high-cost but address critical needs and provide significant benefit

Long-term priority improvements are those that would be implemented within a ten- to twenty-year time frame. These projects typically exhibit the following characteristics:

- They are relatively high-cost and address needs that are considered to be lower priority than those addressed by the mid-term projects; or
- They are of low to moderate cost, but are dependent upon other long-term projects being implemented before they would be considered feasible.

Note that some of the individual projects in the Recommended Scenario can be broken up into logical phases. In some cases, as shown in Table 8.7, the initial phase of a project can be considered a near-term priority while later phases more appropriately fall into the mid-or long-term priority categories.



**Table 8.7: Recommended Scenario Implementation Priorities**

AUTO TRAFFIC CONCEPTS	Immediate Action	Near-Term	Mid-Term	Long-Term	Implementation Comment:
<b>Two-Way Mercer/Narrow Valley</b>					
Mercer from Fairview to Dexter Avenue - 2-Way (currently eastbound only with westbound traffic using Valley/Broad), 6 lanes plus median & left-turn lanes; 4th eastbound lane between Boren and Fairview Avenues (approach to I-5). Phase II cost estimates were completed as a range (low and high), the SLU Transportation Study chose to use the high range.			✓		High cost but critical to overall SLU area improvements. Should be completed prior to development between Mercer and Valley Streets.
Mercer from Dexter to 5th Avenue - 2-Way (currently eastbound only with westbound traffic using Broad), 6 lanes plus median & left-turn lanes (includes widened Mercer Street underpass)			✓	✓	High cost and dependent on AWV Project improvements. Proposed early phase of AWV.
Valley St From Fairview to Westlake - 2-lane w/ left turn lanes and bike lanes. Phase II cost estimates were completed as a range (low and high), the SLU Transportation Study chose to use the high range.			✓		High cost but critical to overall SLU area improvements. Should be completed prior to development between Mercer and Valley Streets.
Roy Street from Westlake to Dexter - rebuild as 2-way (currently wb only), 2 lanes plus left-turn lanes and bike lanes (continuity with Valley Street east of Westlake) & 8th Ave between Mercer and Roy - new street				✓	Follows removal/filling of Broad Street.
Broad St from 5th Ave to 9th Ave - Remove and fill to re-create street grid east and west of Aurora Avenue				✓	High cost and dependent on AWV Project improvements.
Dexter Avenue and Republican Street - Signal			✓	✓	Logically goes with widened Mercer underpass to encourage use of Republican from SR 99.
<b>Mercer/Fairview/I-5 Ramps</b>					
Fairview Avenue NB approach to I-5 - add NB left-turn pocket at Mercer Street (with 2-way Mercer) and NB right-turn lane (approx. 1/2 way between Harrison & Republican), and improve signage on NB Fairview Avenue approach to I-5 on ramps.			✓		NB LT goes with 2-way Mercer Street improvements - added RT lane can be implemented at any time
Reconfigure on-ramp approach to accommodate all four lanes of traffic from Mercer (part of Two-way Mercer project)					Part of 2-way Mercer
<b>New Connections Across Aurora</b>					
Thomas Street from Sixth to Dexter - Overpass of SR-99 (Optional: Harrison instead of Thomas)			✓	✓	Decision regarding Harrison vs Thomas to be made through AWVSRP in coordination with Seattle Center and others.
Thomas St from Fairview to 5th Ave - Add center left-turn lane (Optional: Harrison instead of Thomas)		✓	✓		Logically follows completion of Thomas overpass. However, could provide congestion relief benefits for Mercer Street between Dexter & Fairview/Eastlake prior to the construction of the proposed Thomas Street overpass.
Mercer - Widen underpass across Aurora (part of Mercer Dexter to 5th)					

Table 8.7 (continued) Recommended Scenario Implementation Priorities

AUTO TRAFFIC CONCEPTS	Immediate Action	Near-Term	Mid-Term	Long-Term	Implementation Comment:
<b>Build Street Grid West of Aurora - Part of Alaskan Way Viaduct Project</b>					
6th Ave from Roy to Harrison - overpass of Mercer St to provide new N-S arterial connection from Queen Anne to Denny Way.				✓	High cost, but substantial benefit to 5th/Mercer. Requires removal of Broad Street. Subject to/Coordination with any changes to Seattle Center parking lot.
Taylor Ave - Signal at Mercer and extend Taylor Ave from Mercer to Harrison St.				✓	Subject to/Coordination with any changes to Seattle Center parking lot. Requires removal of Broad Street.
Republican from Aurora to 5th Ave N - new 2-lane street				✓	Subject to/Coordinate with any changes to Seattle Center Parking lot. Requires removal of Broad St
<b>Two-way traffic on 9<sup>th</sup> and Westlake</b>					
Westlake Ave (4-5 lanes) and 9th Ave (3-lanes) from Aloha St to Denny - Two-way from Aloha to Denny (currently 4 lanes nb on Westlake and 3 lanes sb on 9th)		✓			May include bike lanes in place instead of center lane or one lane of parking on 9th. Independent of other improvements
<b>Eastlake Avenue</b>					
Eastlake near Denny - add SB U-turn for access to northbound I-5 express lanes.		✓			Further review in coordination with Center City Access (Transit impacts, etc.)
Eastlake & Thomas - Signal		✓	✓		Logically follows completion of Thomas overpass & Thomas St improvements. However, if the Thomas Street improvements were implemented prior to the overpass a signal at this location could be implemented as well.
Eastlake & Republican - Signal			✓		Primarily needed to facilitate use of Republic as alternate to Mercerr and new E/W transit route using Republican, but improves access to Eastlake Ave as well.

BICYCLE CONCEPTS	Immediate Action	Near-Term	Mid-Term	Long-Term	Implementation Comment:
<b>Improve Around-the-Lake Bike Facilities</b>					
Fairview between Eastlake Ave and Valley St - add bike lanes by rerstriping from 4/5 to 3 lanes (includes signal at Yale Ave).			✓		Relatively low cost but will likely be most useful once Valley St has been reconfigured and bike lanes are installed.
Fairview and Fairview (near Eastlake) - modify intersection for bike/ped access and safety	✓		✓		Immediate action - paint/channelization; mid-term action - curb and gutter, etc.
<b>Bike Routes</b>					
Sign Lakeview Boulevard (across I-5) as a Bicycle Route	✓				
Sign bike route on Eastlake Avenue E (E Garfield to Denny) for bicycle commuters.	✓				
Sign bike-routes on streets noted as "commonly used" in the SDOT Bicycle Guide Map	✓				
<b>Maintain/Improve Dexter as a north/south bicycle corridor</b>					
Sign bike route from Dexter bike lanes to 2nd Avenue bike lanes and proposed bike lanes on 4th Avenue (Center City Circulation Report) via Blanchard & Bell	✓	✓			Signing route to 2nd Ave bike lanes could happen immediately.
<b>Improve bicycle connections across SR 99/Aurora</b>					
Incorporate Lake-to-Bay Trail concepts into the Mercer Corridor Project (costs include trail facilities from Dexter & Mercer to 5th & Thomas. Other costs included with Two-Way Mercer/Narrow Valley).			✓	✓	Completed as part of the Mercer Street and AWVSRP improvements.

Table 8.7 (continued) Recommended Scenario Implementation Priorities

PEDESTRIAN CONCEPTS	Immediate Action	Near-Term	Mid-Term	Long-Term	Implementation Comment:
<b>Terry Avenue N Design</b> - Pedestrian improvements (sidewalk on west side, curbless pedestrian space on east side), remove railroad tracks.		✓	✓		To be implemented as frontage improvements with new development
<b>Eighth Avenue</b> - Pedestrian street		✓	✓		To be implemented as frontage improvements with new development
<b>Cascade Neighborhood Pedestrian Improvements</b>					
Repair and improve sidewalks throughout South Lake Union.	✓	✓	✓		Could be implemented in phases with existing sidewalk maintenance and repair and as other roadway improvements are made and/or as parcels throughout SLU develop
Thomas & Harrison between Fairview and Eastlake - Address uncontrolled intersections and traffic to provide consistent traffic control and improved pedestrian crossings (up to 16 stop signs)	✓	✓			Can be phased--some immediate and some near-term
Harrison, Minor & Pontius around Cascade Park - widen sidewalks		✓			
Harrison Street - Wider sidewalks and curb bulbs		✓			
Thomas Street - curb bulbs		✓			
<b>Sidewalks and Curb Bulbs</b>					
Harrison Street, between Yale and Dexter - widen sidewalks		✓	✓		Could be implemented in phases as part of current development/construction and as other roadway improvements are made and/or as parcels throughout SLU develop.
Harrison between Yale and Dexter Avenues - curb bulbs on all 4 corners	✓	✓	✓		Could be implemented in phases. Section east of Fairview could be implemented first, while sections west of Fairview could be tied to overall sidewalk widening improvements.
Thomas between Yale and Dexter Avenues - curb bulbs on all 4 corners	✓	✓	✓		Could be implemented in phases. Section east of Fairview could be implemented first, while sections west of Fairview could be tied to overall sidewalk widening improvements.
John at Fairview & Westlake - curb bulbs on all 4 corners	✓	✓			Could be implemented in phases as part of current development/construction and as other roadway improvements are made and/or as parcels throughout SLU develop.
Republican at Fairview, Terry, Westlake & Dexter - curb bulbs on all 4 corners	✓	✓			Could be implemented in phases as part of current development/construction and as other roadway improvements are made and/or as parcels throughout SLU develop.
Eastlake at Aloha - curb bulb on Eastlake Avenue E at Aloha Street (possible crosswalk striping)	✓				Could be implemented relatively quickly, as it is a spot location.
<b>Improve Denny Way Pedestrian Environment and Crossing of I-5</b>					
Denny Way I-5 crossing - add 10' sidewalk			✓		
Denny between Stewart and Dexter Avenue - Add curb bulb-outs and countdown signals at signalized intersections	✓	✓	✓		Could be implemented in phases as part of current development/construction and as other roadway improvements are made and/or as parcels throughout SLU develop. Independent of other improvements.

Table 8.7 (continued) Recommended Scenario Implementation Priorities

TRANSIT CONCEPTS	Immediate Action	Near-Term	Mid-Term	Long-Term	Implementation Comment:
<b>Transit emphasis/transit priority street on Fairview Ave N</b>					
Fairview Avenue at Denny Way - add NB & SB Transit Signal Priority (TSP).		✓			
Fairview Avenue at Harrison Street - NB queue jump and SB TSP		✓			
Fairview Avenue at Mercer Street - NB and SB TSP.		✓			
Fairview Avenue at Valley Street - NB and SB TSP		✓			
<b>SLU Streetcar</b> (Westlake Center to FHCRC (Yale Ave) on Westlake via Westlake/Valley/Terry.)		✓			Analysis and design and analysis in progress
<b>New Bus Route (Trolley or Other Electric Technology) Uptown to N. Capitol Hill via Mercer or Republican</b>			✓		Steep grades on Lakeview/Belmont require trolley or other electric technology. Stops on Belmont may be limited due to grade and narrow cross-section.
<b>Bus Shelters</b>					
Install transit bus shelters along bus routes in study area (9)		✓			
Include appropriate lighting at shelters		✓			

## Funding

Funding for the recommendations will come from a range of local, state and federal funding sources, and may include:

- State and Federal grants and appropriations
- Regional sources, such as the proposed Regional Transportation Investment District (RTID)
- City funds
- Bay Freeway Property proceeds (In 2002, the City of Seattle sold transportation properties that were purchased in the 1960's and 70's for the Bay Freeway project in South Lake Union. A portion of the property proceeds is designated for transportation improvements in South Lake Union.)
- Local Improvement District (LID)
- Mitigation from development
- Street frontage improvements with new development

Table 8.8 summarizes the estimated funding distribution between City and other funding sources for the major projects and other projects proposed in the Recommended Scenario by area.

**Table 8.8: Estimated Funding Allocation**

Project/Area	City Funds	Other Funds
Mercer/Valley from Fairview to Dexter	\$9 M	\$73 - \$86 M
AWVSRP – Widen Mercer Option	\$12 M	\$62 M
South Lake Union Streetcar	\$2.5M*	\$42.5 M
South Lake Union (other)	\$8.5 M	\$8.6 M
West of Aurora	\$10.1 M	\$10.2 M
East Connections	\$3.3 M	\$3.4 M
Total	\$45.4 M	\$199.7 - \$212.7 M

\*City share of the LID

An explanation of the assumptions on non-City funding for the first three projects noted in Table 8.8 follows.

### Mercer Corridor Project (Mercer/Valley from Fairview to Dexter)

The widening of Mercer Street between Fairview and Dexter Avenues, along with the re-building of Valley Street, is an SDOT priority for the RTID or similar funding sources. Other potential sources include State and federal funds and developer mitigation funds.

### Alaskan Way Viaduct and Seawall Replacement Project – Widen Mercer Option

The widening of Mercer Street between Dexter and Fifth Avenues, the Thomas overpass, and removal of Broad Street would be funded through the AWVSRP project. The AWVSRP project has identified a range of anticipated revenues from State, federal, regional and City sources. The AWVSRP assumes that 8 to 12 percent of the entire AWVSRP would be paid by City funds. Table 8.8 shows a higher share for the Widen Mercer Option.

### South Lake Union Streetcar

A local improvement district would fund over half (\$25 million) of the total cost of the streetcar. This includes an estimated \$2.5 million for the City's share of the LID. The streetcar has secured \$8.5 million in additional funding from State and federal sources and has other grant applications pending.

### South Lake Union and Adjacent Areas

To estimate the City share of the remaining projects, SDOT reviewed other typical projects in the City's Capital Improvement Program (CIP). In general, the City share of projects in the CIP is up to 50 percent. Non-City funds would come from State and federal grants and appropriations, as well as developer mitigation funds.