



**C
o
n
n
e
c
t
i
v
i
t
y**

**W
a
y
&
W
a
l
k
a
b
i
l
i
t
y**



Executive Summary

Travel into and about South Lake Union is currently a complex and difficult process. This report summarizes the analysis and recommendations made in three key areas that contribute to how people travel: connectivity, wayfinding and walkability.

Connectivity. Interstate-5, Denny Way, Aurora Avenue, and Lake Union itself limit the accessibility and appeal of South Lake Union (SLU) from its surrounding neighborhoods. Key entrances into SLU were identified and recommendations are made that would enhance connectivity both physically and psychologically.

Wayfinding. A wayfinding system was developed to guide both the familiar and unfamiliar travelers into, around and out of SLU. Key entrances and attractions as well as the points between are identified as places for wayfinding tools such as guiding posts and kiosks.

Walkability. A walkability study of SLU was conducted using GIS Network Analysis to determine the percentage of parcels that are within walking distance of a given set of services (banks, post office, schools, libraries, restaurants, bars, etc). The results of the analysis identify the areas within SLU where residential development should be concentrated as well as areas where certain services are lacking.

Connectivity

Introduction

South Lake Union is physically isolated from its surrounding neighborhoods by several regional transportation networks – Aurora Avenue/State Route-99, Interstate-5 and Denny Way. Aurora Avenue has a cement barrier/median making it impossible for automobiles and pedestrians to cross, thereby blocking the connection between SLU and Seattle Center, Uptown and Queen Anne. The I-5 freeway, a multi-lane, multi-level concrete structure, hinders access to Capitol Hill. The lack of information of what lies ahead deters pedestrians and confuses automobile drivers. The presence of the interstate also causes high automobile traffic during peak hours, creating connectivity difficulties across Mercer Avenue and Denny Way. During rush hour, Denny Way impedes connectivity between SLU and north downtown, especially for pedestrians. These physical barriers make it

difficult to reach destinations within SLU. Finally, it is difficult to know when one has entered the neighborhood because of a lack of signage. This psychological barrier may discourage visitors from venturing into the neighborhood.

Methods and Findings

The University of Washington Urban Design and Planning team walked the perimeter of SLU to better understand the problems of connectivity in the neighborhood, specifically seeking the physical connections between SLU and its surrounding neighborhoods. Beginning near the intersection of Eastlake Avenue and Yale Avenue, the team walked east into the Fred Hutchinson campus. Turning south at Interstate-5, they searched for connections east into Capitol Hill. There are two automobile/pedestrian connections at Lakeview Boulevard and Denny Way bridging over I-5. Lakeview Boulevard offers a beautiful view of Lake Union, and each time the bridge was visited, pedestrians and bikers were found enjoying the walk. For non-automobile travelers, it is a long, but gentle climb north, along the freeway that then turns east to cross Interstate-5 into Capitol Hill (Figure 1.1).



Figure 1.1 The top of the Lakeview Boulevard bridge over Interstate-5

important connection, used by both automobiles and pedestrians.

Thereafter, the southern edge was explored on Denny Way. Denny Way is a preferred east-west arterial for many drivers since it is one of a few streets that offer a direct two-way route to the west and east. The un-matching street grid



Figure 1.3. The grid patterns are misaligned at the joining of the North Downtown and SLU.



the boundaries of SLU in an artistic and appealing way, as opposed to simple signage.

The challenges posed by Interstate-5 are similar to those posed by rivers in dense urban areas. To remedy these challenges, the team explored measures taken by cities with rivers, such as New York City, Paris, and Amsterdam. In these cities, bridges are viewed as more than a necessary component of the transportation network; rather, they are celebrated as a beautiful part of the city. Artistic, appealing decorations and enhanced pedestrian amenities can transform the Lakeview Boulevard and Denny Way bridges over Interstate-5 into gateways into SLU that inform travelers that they are entering a real, vibrant, growing neighborhood – a neighborhood that the city cares about. Additions such as flags and pedestrian-scale, old-style lampposts could give the bridges a ‘London Bridge’ atmosphere that celebrates the maritime traditions of SLU and has a classic look. To extend this connection, east- and west-bound streets leading further into SLU are necessary. Currently, pedestrians are well serviced, but automobile traffic on Eastlake Avenue is forced to travel two blocks south to Republican Street in order to head west. A portion of Mercer Avenue, between Fairview Avenue and Eastlake Avenue should be converted into a two-way street to better serve the Lakeview Boulevard entrance from Capitol Hill. The Seattle Department of Transportation has already begun plans to convert the entire Mercer corridor into a two-way street.

Denny Way, a popular and highly traveled arterial should be better integrated with the upcoming changes occurring in the area. The Denny Way streetscape does not offer many opportunities for changes because the area is physically built up and heavily used (figure 1.6). A great opportunity to link the already occurring development of the 2200 Westlake development at Denny Way between Terry and Eastlake Avenues presents itself here. The development, which will include a Whole Foods grocery market, retail space, condominiums and hotel rooms, offers the unique chance to integrate a pedestrian bridge into the design, which would connect it to SLU. The bridge could begin in the new development at an outdoor European-style plaza above street



Figure 1.6 Emergence of State Route 99 onto Aurora Avenue

level. This would encourage and foster safe pedestrian access to and from SLU to the northern edge of Downtown at the Denny Triangle. This development is a highly anticipated commercial and retail hub that locals and tourists are bound to experience, furthering the need for a safe, attractive and convenient way to get closer to the future amenities and services SLU will be providing.

SLU is disconnected from its western counterparts of Seattle Center and the Queen Anne neighborhood because of Aurora Avenue. The exit/conversion of Aurora Avenue with SR-99 at Denny Way is an imposing barrier that restricts travel across this high speed arterial. One of the few east-west crossings is through Denny Way, and the next crossing is a few blocks north in Queen Anne. Figure 1.6 shows traffic entering Aurora Avenue from SR-99. At the moment, the City of Seattle is considering two options to increase mobility and decrease traffic in this general location, which will guide the coming recommendations.

Alternative I: The City of Seattle is considering sinking Aurora Avenue to the current depth level where it exits the underground tunnel below the intersection of Denny Way and Aurora Avenue. This project will integrate two at-grade pedestrian bridges over the sunken road, one at Republican Street and the other at Harrison Street across Aurora Avenue. This proposal would also eliminate Broad Street, resulting in a consistent grid pattern that is now distorted by the diagonal running Broad Street.

Alternative II: In this alternative, Aurora Avenue would remain as it currently exists. The need for a pedestrian linkage becomes more crucial, particularly because there are no vehicular or pedestrian bridges proposed for this scenario. A pedestrian bridge should be constructed at Thomas Street over Aurora Avenue. Thomas Street is appropriate because it is central to Seattle Center, which is highly visited by both locals and tourists. Moreover, the proposed monorail station will be located in the triangular block bounded by John Street, Broad Street and 5th Avenue, one block from Thomas Street and the proposed bridge.

While the above recommendations will enhance pedestrian access to SLU from the east, west and south, it is still difficult to enter SLU from the north without motorized transportation. Considering the growth expected in SLU over the next twenty years, as well as the popularity of Fremont and other Lake Union neighborhoods as hubs of activity, a “water bus” type of ferry service in Lake Union has considerable potential. Westlake Avenue and Fairview Boulevard are pedestrian friendly, but the walk along Lake Union is long, and a “water bus” type of service would enhance the ability of pedestrians to enter and exit SLU. The



patterns that meet at Denny Way cause a disconnect between SLU and North Downtown (Figure 1.3). The grid pattern south of Denny Way and its awkward alignment with respect to the grid pattern north of Denny Way limit a continuous, directional flow at the automobile level and is worse at the pedestrian/bicycle level. Moreover, steep topography in some sections on Denny Way carry an added risk for anyone crossing Denny Way at the street level. Cars climbing the hill cannot see pedestrians crossing at the top of it. Along Denny Way, there are only a few pedestrian crossings (at Eastlake, Terry, and Aurora Avenues). Moreover, the pedestrian wait period to cross is lengthy and risky as automobile drivers are moving at alarming speeds through here. There is a clear need to integrate pedestrian mobility and safety across Denny Way.



Figure 1.3. The grid patterns are misaligned at the joining of the North Downtown and SLU.



Figure 1.4 Concrete barrier in the Aurora Avenue median

Observations were then conducted along Aurora Avenue. Looking west towards Seattle Center from the eastern sidewalk of Aurora Avenue, a disconnect between SLU and the Seattle Center area is evident (Figure 1.4). Aurora Avenue is a high volume automobile thoroughfare that gives travelers little opportunity to make use of the businesses to either side. Considering the tourist and local attractions to the west of Aurora Avenue and the revitalization of SLU, the need for unification of these two areas is crucial. Most of the businesses located near Aurora Avenue need a facelift and there is little pedestrian activity around them. Moreover, Aurora Avenue's sidewalks are poorly maintained and are difficult to travel on. Sidewalks are misaligned, cracked and lifted by roots, creating an unsafe pathway for people with disabilities.

The team then turned east and walked along the waterfront back towards Fairview Avenue. The waterfront boasts a beautiful park and several restaurants and marine spaces. The only way for non-boat owners to approach it is from Fairview or Westlake Avenues or from Valley Street. However, on several occasions from several sources, the team learned that SLU citizens are interested in bringing passenger ferries into Lake Union to service the immediate neighborhoods. To address this need, private organizations were contacted and interviewed, and potential sites for a landing were investigated.

The walk around the perimeter of the neighborhood allowed for observations of physical connectors to surrounding neighborhoods. Visual connections that would encourage travelers to cross boundaries and enter SLU were also explored. All edges lack a signage system identifying South Lake Union, and there were no advertisements of the attractions ahead.

Recommendations

The entrances to SLU should be enhanced with gateways that celebrate the neighborhood and mark its borders. In the north, such gateways could be placed on the docks of the future ferry terminal leading into South Lake Union Park and on Fairview and Westlake Avenues as people enter the neighborhood; in the east, at the foot the two bridges over Interstate-5; in the south, over the streetcar tracks on Westlake Avenue; and in the west, on Denny Way, Thomas Street, and Mercer Avenue. While the gateways on Westlake Avenue and at the docks should be large and celebratory, perhaps arches spanning the road, the gateways at the east and west could be smaller markers that encompass the maritime theme of SLU. Like the totem poles outside Pioneer Square and the statues marking the edges of Fremont, large anchors, ship's wheels, or wooden boats would mark



Connectivity Recommendations

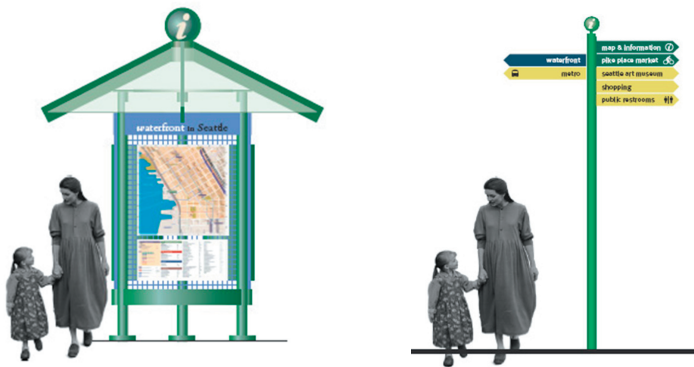


best location to place the ferry terminal would be in or near South Lake Union Park. This area has the greatest potential for a “grand entrance” into SLU, and it is well connected to the bus system and the future streetcar. These connections would be beneficial to both Seattle-residents and tourist traffic. To accomplish this, the city could entice a private company to launch a ferry enterprise by offering the conditional use of one of the piers outside the Armory building.

Wayfinding

Introduction

The City of Seattle contracted Sea Research Ltd. to research and develop a wayfinding system, a project entitled the “Center City Wayfinding Project.” This research was the second phase of the original pilot study conducted by the Seattle Department of Transportation that installed 28 wayfinding kiosks in the downtown Pike Place area and First Street. The Sea Research Ltd. study, completed in 2003, created a design manual to be used by center city neighborhoods specifying the design guidelines for a system of kiosks (Figure 2.1) and finger signs (Figure 2.2) such that the wayfinding system is unified between neighborhoods. The project has since been passed back to the Seattle Department of Transportation. No tools have yet been installed.



Figures 2.1 & 2.2 Design for Kiosk and Finger Pointing Sign. Courtesy Sea Research Ltd.

Thus, this is not an attempt to design an entirely new wayfinding system for SLU. Rather, this report is limited to identifying the specific locations that the wayfinding tools should be placed. An additional recommendation is also included for a supporting, minor layer of wayfinding that does not rely on signage, and that could possibly be implemented citywide.

Methods

Using the Sea Research study and onsite observations, entrances were mapped and classified as pedestrian-oriented or automobile-oriented. Current and future attractions both within and nearby the neighborhood were then added. With these key components in place, the expected flow of traffic was drawn and key intersections were identified. Finally, points at which the Sea Research Ltd. wayfinding devices should be implemented were identified.

Findings

The following are key entrances, intersections and points of attraction in South Lake Union:

Pedestrian-oriented entrances:

- Bottom of Lakeview Boulevard bridge as it intersects with Eastlake Avenue
- Bottom of Denny Way bridge as it intersects with Eastlake Avenue
- Streetcar stops
- Intersection of Thomas Street and Aurora Avenue (if Aurora Avenue is sunken) OR the bottom of Thomas Street pedestrian bridge (if current Aurora Avenue configuration remains)
- Top of pedestrian underpass at Mercer Street and Aurora Avenue

Automobile-oriented Entrances:

- Intersection of Westlake Avenue and Highland Street
- Intersection of Fairview Avenue and Eastlake Avenue
- Intersection of Lakeview Boulevard and Eastlake Avenue
- Intersection of Aurora Avenue and Thomas Street
- Intersection of Aurora Avenue and Mercer Street
- Intersection of Denny Way and Eastlake Avenue
- Intersection of Denny Way and Westlake Avenue
- Intersection of Denny Way and Aurora Avenue

Major Area Attractors:

- South Lake Union Park
- REI
- 2200 Westlake/Whole Foods
- Denny Park



Minor Area Attractors:

- Waterfront restaurants at the intersection of Fairview Avenue and Minor Avenue
- Cascade Playground/P-Patch
- Fred Hutchinson Campus

Key Intersections:

- Fairview Avenue at Valley Street, Mercer Street, Republican Street, Thomas Street, and Denny Way
- Thomas Street at 9th Avenue, Terry Avenue, and Eastlake Avenue

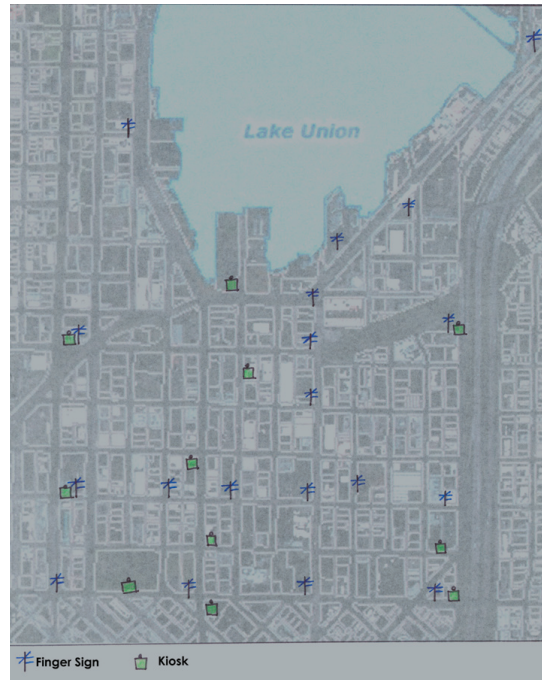
Recommendations

All pedestrian-oriented entrances are priority points for kiosks. They can inform visitors of what is available ahead in addition to providing directions to those attractions. The major area attractions themselves also require kiosks, as visitors need to know where to go next after visiting one of the sites.

The minor area attractions, automobile-oriented entrances and key intersections are ideal for directional finger signs. Such signs are guiding posts that could be utilized by both pedestrians and automobiles. They are visible to automobiles as a quick reference. Concurrently, they would also include a directional to the nearest kiosk for detailed information for pedestrians.

Please see the Center City Wayfinding Study (Sea Research Ltd.) for further details on these wayfinding tools.

In addition, the gateways and border markers detailed in the connectivity section



Wayfinding tool locations

of this chapter are key enhancers of both connectivity and wayfinding. Their implementation should be considered a benefit to both of these sectors and integrated with the wayfinding system.

Finally, wayfinding will be greatly enhanced if SLU is visually distinctive from surrounding neighborhoods. If a car is on an arterial such as Mercer Street or Denny Way, it can travel into SLU without the driver noticing that he/she has entered a different neighborhood. Therefore, a subtle but clear difference in the SLU environment is necessary to alert the traveler, especially the automobile traveler, that he/she has entered SLU. Changing the color or design of the street signs in the area will create an obvious distinction that is quickly understood. Furthermore, a quick glance at the already proliferate street signs will clue the traveler without him/her having to stop and read.

Not all neighborhoods in Seattle are blessed with distinctive architecture, as in Pioneer Square and the International District. Flags and banners create distinction between neighborhoods while lending a festive look, but these decorations are artificial characteristics. Making the street signs of each neighborhood a different color is a more subtle way to enhance the difference between neighborhoods and increase wayfinding throughout the city.

Walkability

Research has found that there is a correlation between high rates of obesity, decreased physical activity and auto-oriented types of urban development. In fact, people living in walkable neighborhoods are two times more likely to be physically active than those who live in the less walkable areas. It has also been argued that in contrast to physical activity promotion programs, which typically have short-term effects, building walkable neighborhoods can be expected to have relatively permanent effects. This becomes particularly relevant when considering the alarming rate of obesity in the United States—over 20% of American children are overweight or obese. Additionally, walkable communities are more compact and people tend to drive less, which makes them more sustainable. Finally, walkable neighborhoods have stronger communities, a higher quality of life and higher housing values due to accessibility to services.

Given the fact that walkable neighborhoods have many positive impacts on their residents, it is important to quantify and analyze walkability in South Lake Union. The goal of this analysis is to identify the most and the least walkable areas in



SLU, so that new development and services are integrated to better serve the community.

Methods

Geographic Information Systems (GIS) Network Analysis was used to identify parcels in SLU that are within walking distance of a given set of services using the existing street network. Walking distance was defined as 0.5 miles or roughly a ten-minute walk. Research has shown that people are most likely to walk to destinations that are under 0.5 miles away .

GIS Network Analysis first calculates what is known as service areas for the given distance and then selects the parcels that intersect with the resulting service areas. Service areas are identified as the region within a certain distance from a site using the existing street network (for example, the region within half a mile of a shopping center).

In this study, service areas represent the area a person would cover by walking half a mile from a given site in every possible direction using the street network. Service areas are represented by polygons that can be used to identify how many parcels, how much land, how many people, etc., are within them. Figure 3.1 shows a service area (blue polygon) for a given destination represented by the red star.

-  Streets
-  Parcels
-  Destination
-  Service Area

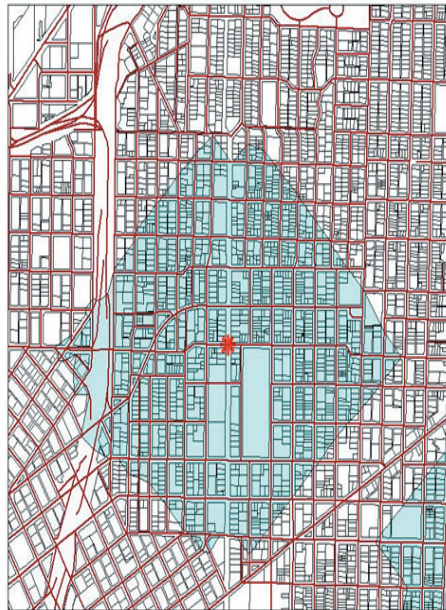


Figure 3.1. Example of service area around a given destination

This analysis was conducted for the following services: banks, churches, community centers, health centers, libraries, groceries stores, p-patches, playgrounds, post offices, public and private schools, bars, restaurants and theaters. Following are maps for each of the services; parcels within half a mile of the given destination are highlighted in yellow. Steep slopes are also included, highlighted in orange, to show areas that may be difficult for pedestrians to travel.

Parcels within half a mile of a Bank

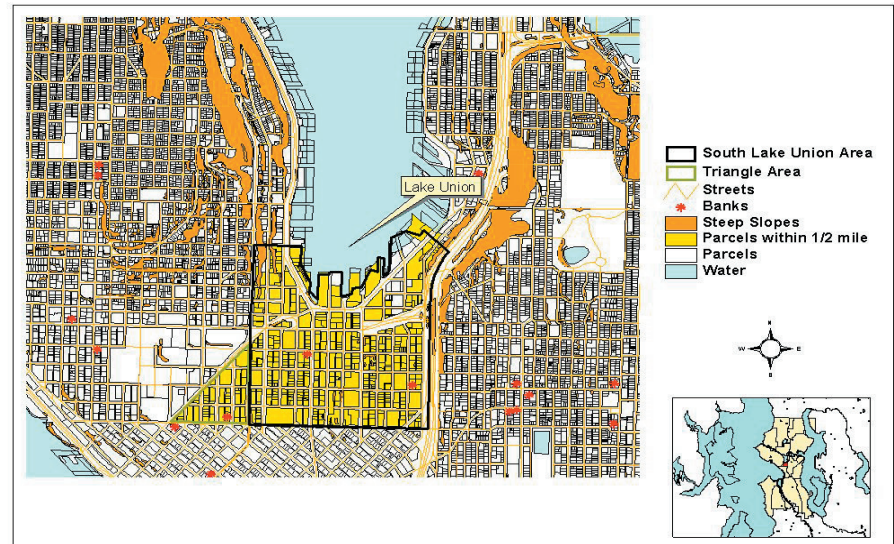


Figure 3.2. Banks (83% parcels are within one half mile)

Analysis



Parcels within half a mile of a Church

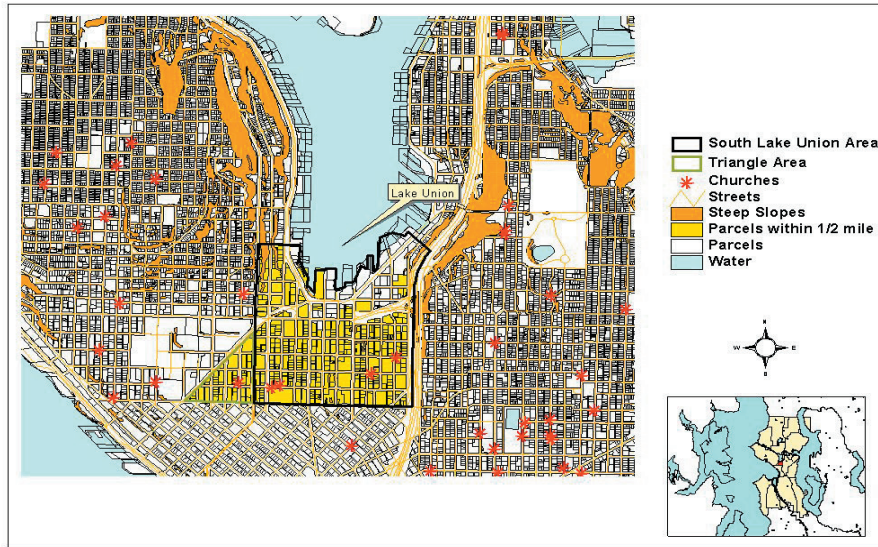


Figure 3.3. Churches (89 % parcels are within one half mile)

Parcels within half a mile of a Health Center

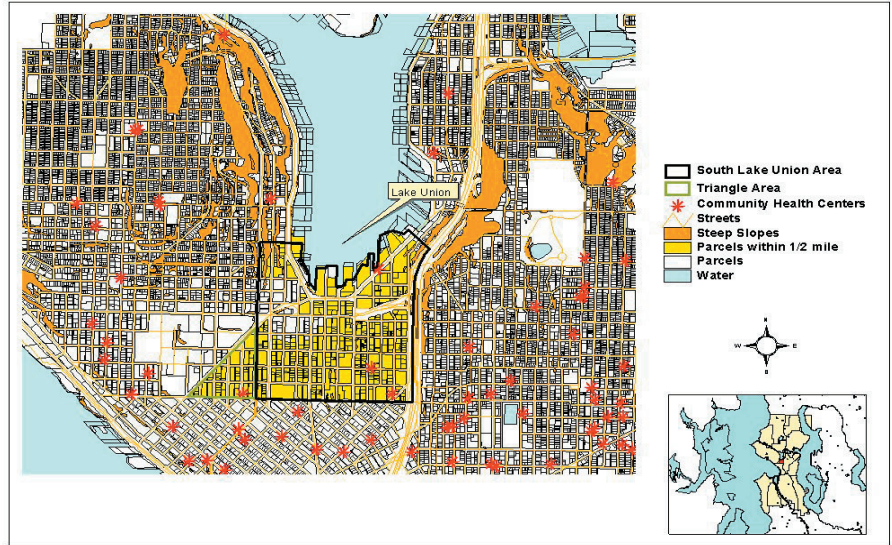


Figure 3.5. Health Center (91% parcels are within one half mile)

Parcels within half a mile of a Community Center

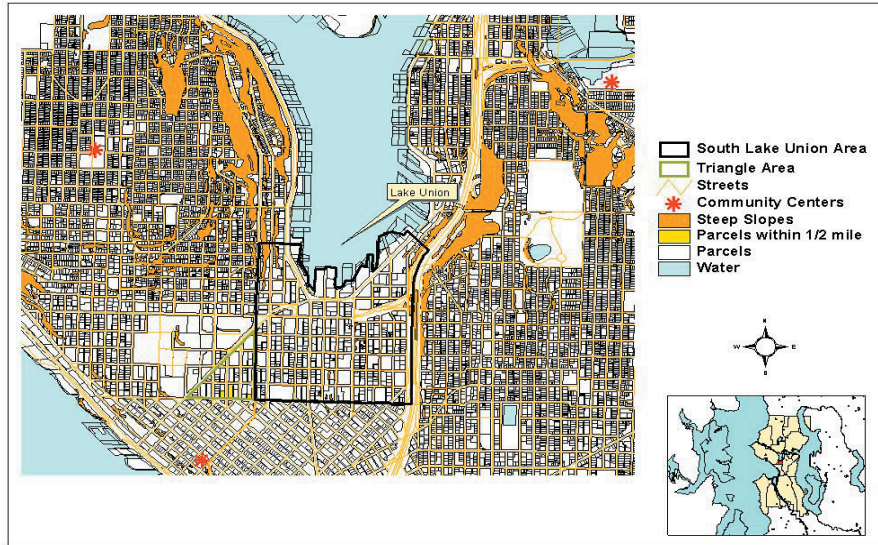


Figure 3.4. Community Centers (1 % parcels are within one half mile)

Parcels within half a mile of a Library

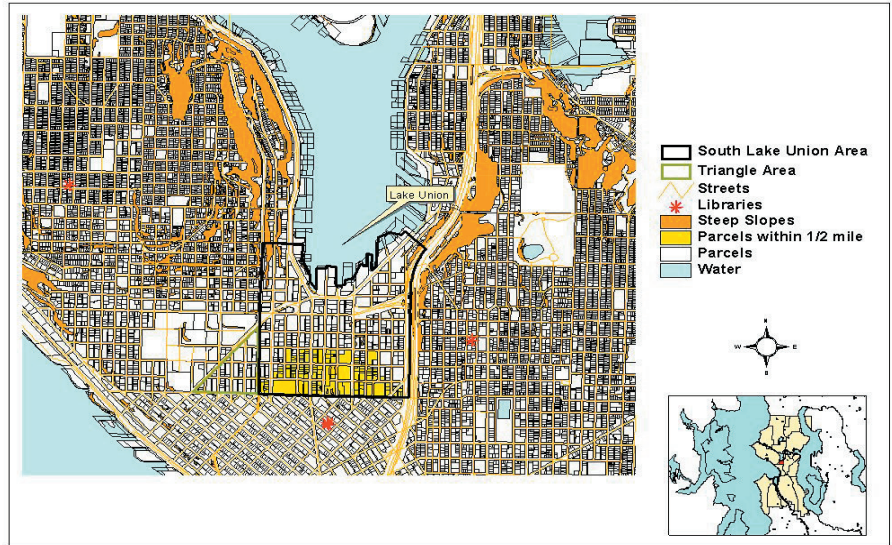


Figure 3.6. Libraries (28 % parcels are within one half mile)



Parcels within half a mile of a Grocery Store

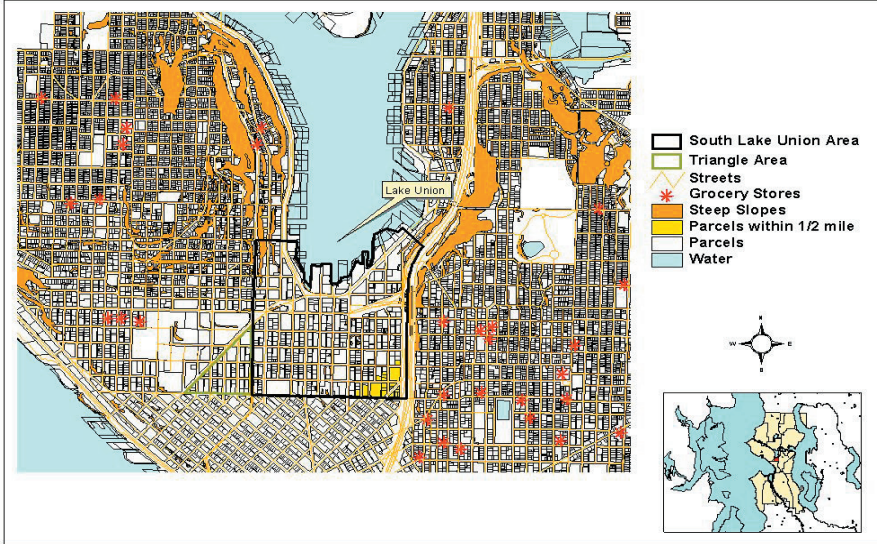


Figure 3.7. Grocery Stores (5 % parcels are within one half mile)

Parcels within half a mile of a Playground

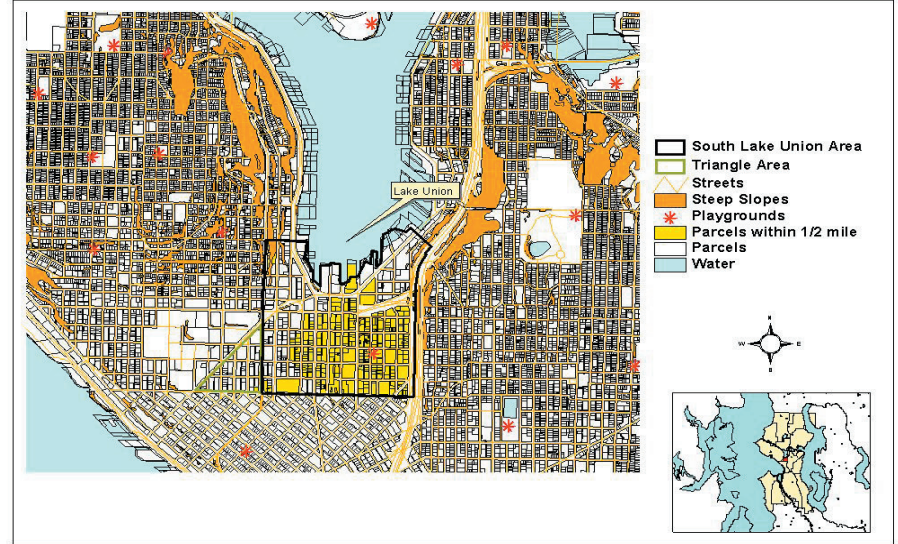


Figure 3.9. Playgrounds (59% parcels are within one half mile)

Parcels within half a mile of future Whole Foods

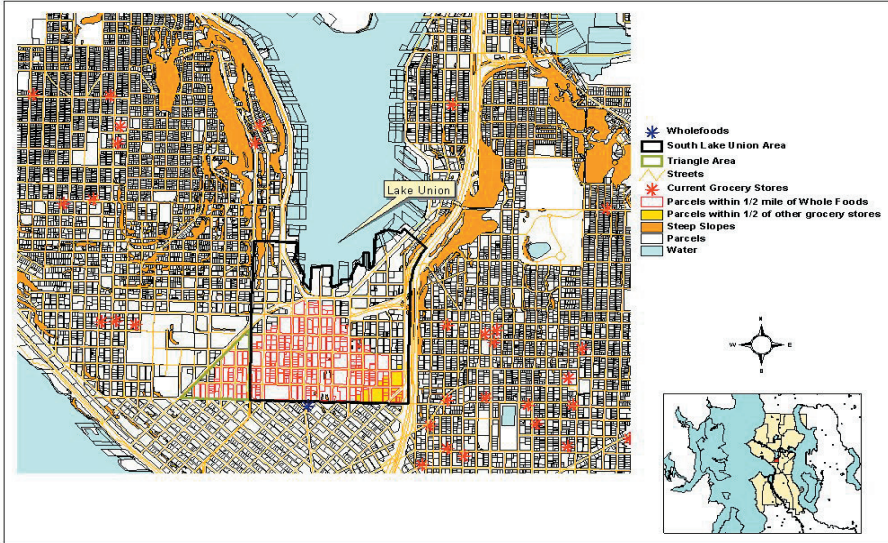


Figure 3.8. Future Whole Foods-parcels in red. (47% parcels within one half mile)

Parcels within half a mile of a P-Patch Garden

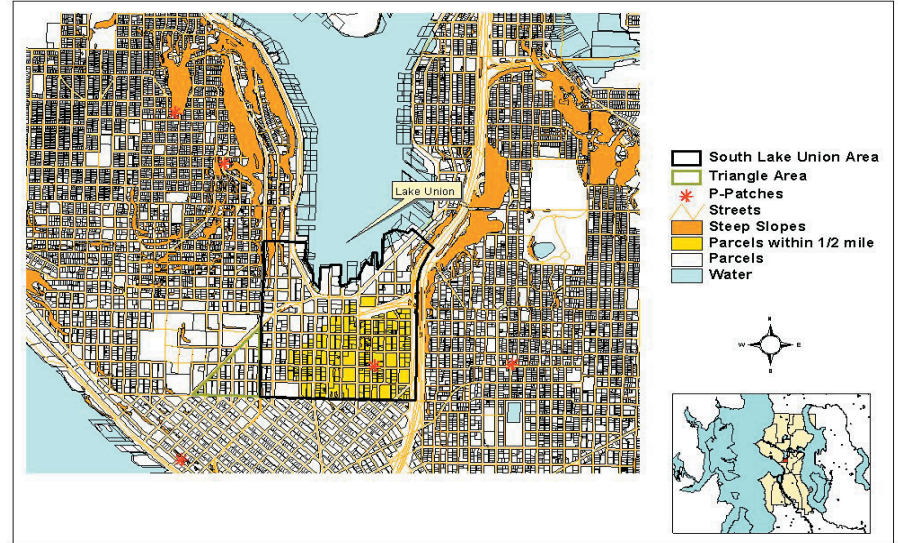


Figure 3.10. P-Patch Gardens (52% parcels are within one half mile)



Parcels within half a mile of a Post Office

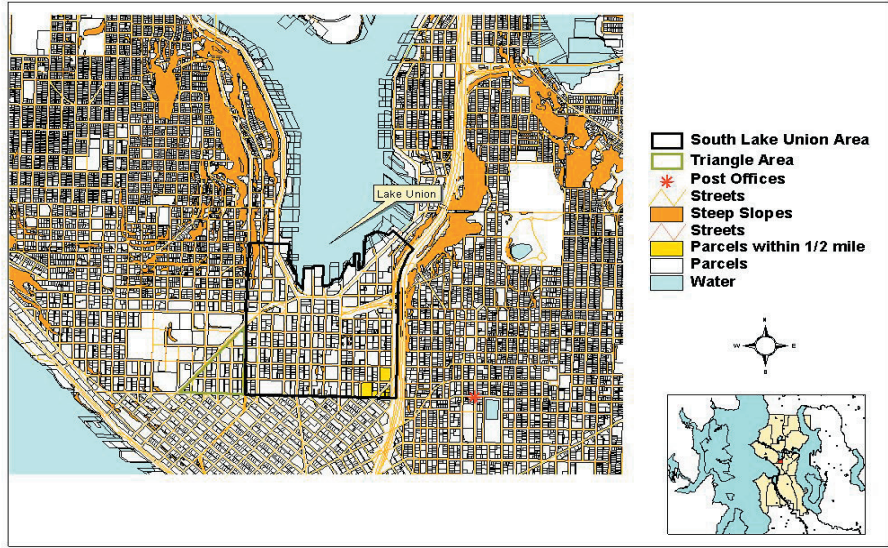


Figure 3.11. Post Offices (2% parcels are within one half mile)

Parcels within half a mile of a Private School

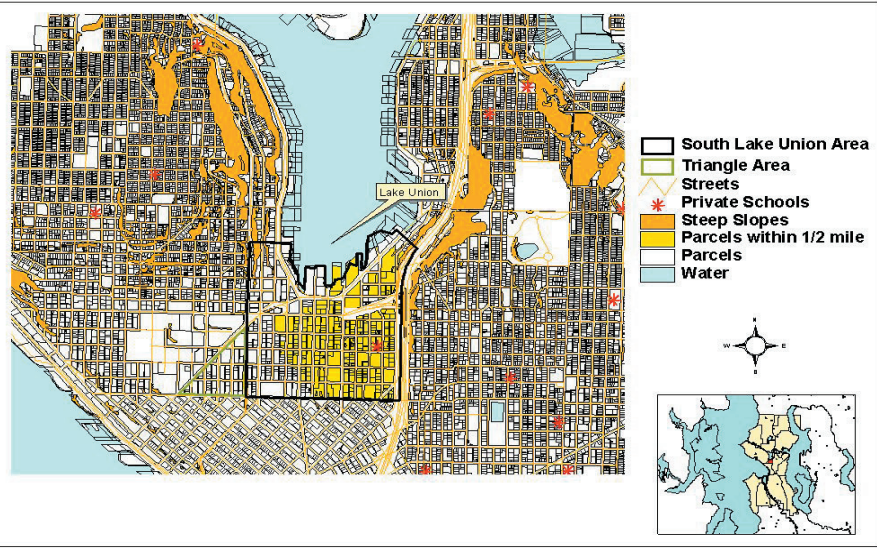


Figure 3.13. Private Schools (54% parcels are within one half mile)

Parcels within half a mile of a Bar or Restaurant

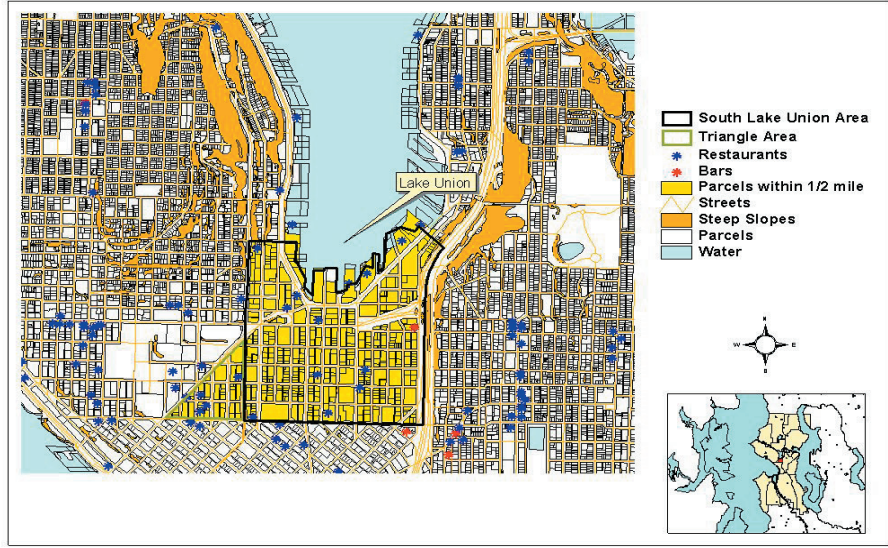


Figure 3.12. Restaurants (99% parcels are within one half mile)
Bars (14% parcels are within one half mile)

Parcels within half a mile of a Public School

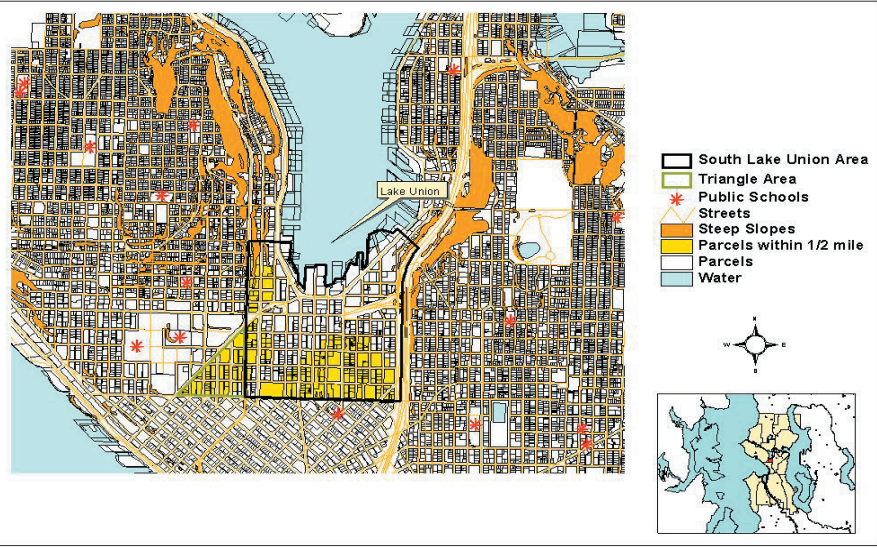


Figure 3.14. Public Schools (48% parcels are within one half mile)



Parcels within half a mile of a Theater

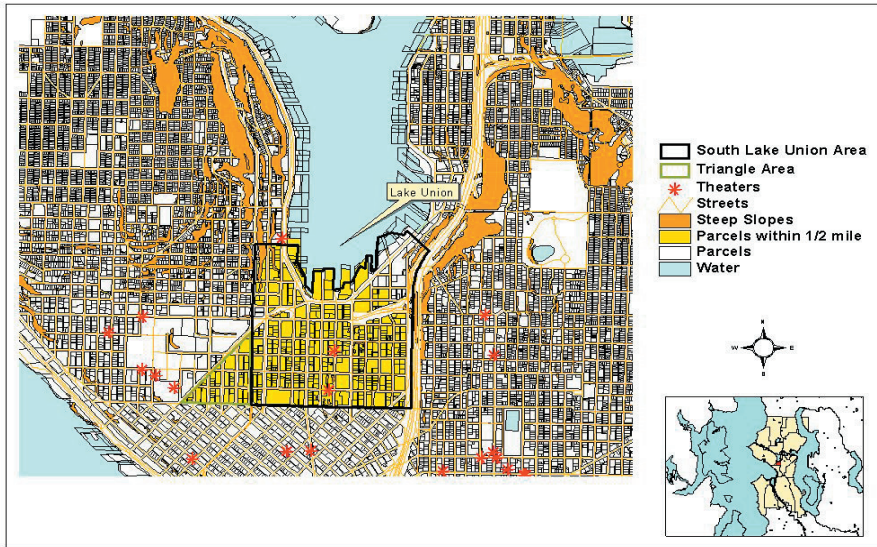


Figure 3.15. Theater (92 % parcels are within one half mile)

Recommendations

Based on the results of the analysis, it is advisable that the following services be placed within South Lake Union

- A community center. There is no community center in SLU. Only 1% of the parcels are within half a mile of a community center, which is located in Belltown.
- A new playground and a new p-patch garden should be placed in the western part of SLU, since the only playground and p-patch in SLU are located in the eastern part. Potentially they could be placed within Denny Park and/or South Lake Union Park.

The following services are available in adjoining neighborhoods and can be shared by SLU residents. If, however the population of SLU exceeds the feasibility of joint usage between neighborhoods, these services would be needed in SLU.

- A library. There is no library in SLU-- 28% of the parcels are within half a mile of a library, the nearest is in Belltown.
- A post office. There is no post office within SLU. Only 2% of the parcels are within half a mile of a post office, the nearest of which is located in Capitol Hill.
- A public school. Currently there is no public school within SLU. There are a few in the surrounding neighborhoods, with 48% of the parcels being within half a mile of a public school. Population within SLU is forecasted to increase by 8000 people in the next twenty years. Biotech related communities in other parts of the country (ex. San Diego, Bellevue, San Jose, etc.) have higher numbers of families that what is found currently in SLU. One can predict that the number of families will eventually increase sufficiently in the area to justify adding a new school.



References

Suminski, Richard R., Poston, Walker S. Carlos, Petosa, Rick L., Stevens, Emily, and Katzenmoyer, Laura M. "Features of the Neighborhood Environment and Walking by U.S. Adults." American Journal of Preventive Medicine 2 (2005) : 149-155.

Federal U.S. Centers for Disease Control and Prevention.

Helling, Amy, and Sawicki, David S. "Race and Residential Accessibility to Shopping and Services." Housing Policy Debate, 14 (2003) : 69-101.

Moudon A., Lee C., Cheadle A., Johnson D., Schmid T., Weathers R. June. "Attributes of Walking-Supportive Environments." Submitted to the American Journal of Preventive Medicine. (2004).

Washington State Geospatial Data Archive. April 25, 2005. University of Washington <<https://wagda.lib.washington.edu/gis/uwonly/data/seattle/>>

