

4. Bike-Share Program Recommendations

Overview

Public use bike-share programs allow bicycles to be rented for short times from unattended, fixed stations and permit renters who have taken bikes from one location to return them to any other station. Bike-share programs have successfully operated in European cities for a number of years. The first U.S. program began in 2009 in Washington D.C. and programs are currently being studied or implemented in other North American cities. This report presents our analysis of the feasibility of a bike-share program in Seattle. The report was contracted by the City of Seattle and completed, as a studio class, by University of Washington Urban Design and Planning students.

We initially analyzed the potential ridership demand in Seattle for a bike-share system and then evaluated policy and regulatory issues that might be relevant to installation or operation of such a system. Based on these findings, the project team concluded that a bike-share system could be successful in Seattle. However, there are institutional and operational barriers that will need to be addressed. With these barriers in mind, we have developed a series of recommendations to the city that would help to ensure a bike-share system would work. These recommendations are presented in this chapter.

Recommendations

We recommend a three-phase implementation of a bike-share program for Seattle. These phases are based on the GIS analysis detailed earlier in this report. This analysis used a quantitative study of Seattle bike-share market characteristics based on a research approach used in Philadelphia, Pennsylvania. It is important to note that our recommendations are general targets, which serve as useful guidelines to illustrate the potential scope and scale of a bike-share program. The recommended phased areas and demand estimates resulted from a strict interpretation of the demand analysis. Later sections of the report addressed other issues that might impact demand, such as climate, culture, and policy issues.

Phased Bike-Share Service Areas

The proposed phasing of bike-share implementation areas is shown in Figure 9. These boundaries are not intended to serve as strict borders, but more as guidelines to represent the general areas in Seattle where bike-share would be most successful. Additional factors such as the location and interests of potential funding organizations, race and social justice concerns, transportation planning policies, geographic equity, and political factors were not included in our analysis. These may be considered by the City of Seattle in determining the final implementation area boundaries and phases. It should also be noted that implementation of Phases 2 and 3 should be contingent on successful implementation of Phase 1.

Proposed Seattle Bike-Share Implementation Phases

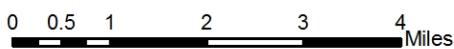
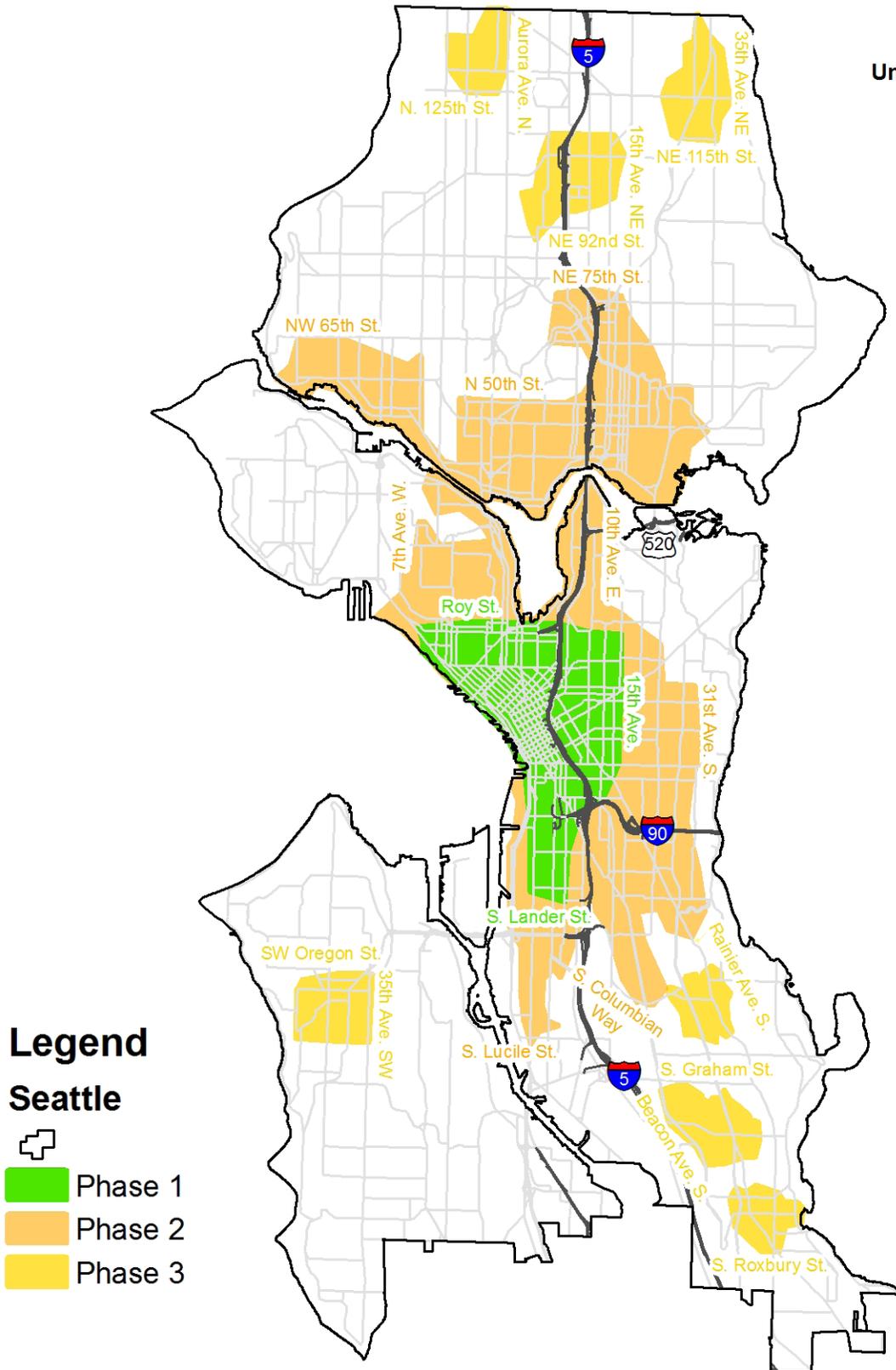
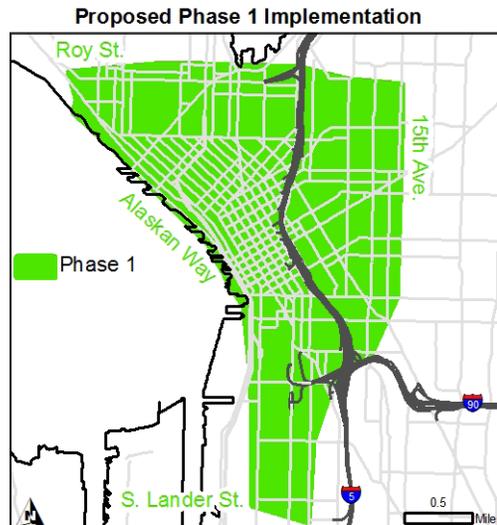


Figure 9: Proposed Seattle Bike-Share Implementation Phases

Phase 1

Phase 1 of the proposed bike-share implementation area covers downtown Seattle and surrounding areas in Lower Queen Anne, South Lake Union, Capitol Hill, International District and SODO. Figure 10 provides a close-up of the proposed Phase 1 area. According to the results of the demand analysis, this area represents the largest contiguous area with a high concentration of potential bike-share users and the related land use and infrastructure that supports bike-share ridership.

Figure 10: Proposed Phase One Seattle Bike-Share Implementation Area



Although the University District scored highly in the demand analysis and has potentially supportive elements, we do not recommend including it in Phase 1 because it is geographically disconnected from the largest contiguous area of high bike-share demand potential in the Seattle downtown core. The primary corridor connecting the University District and the downtown did not score well in the demand analysis and could create a potential risk to the system if the University District was included. Existing and successful bike-share systems have a well-defined contiguous area of service where users can easily enter and exit the system and be assured a bike-share station is always nearby.

Phase 2

Phase 2 of the proposed bike-share implementation area expands out from the Phase 1 downtown core to include surrounding areas and additional neighborhoods in North Seattle. The neighborhoods included in Phase 2 are Queen Anne, Eastlake, Capitol Hill, First Hill, Central District, Northern Beacon Hill, and the Industrial District. The expansion into North Seattle includes the neighborhoods of the University District, Green Lake, Wallingford, Fremont, and Ballard. As with Phase 1, the areas identified in Phase 2 represent a large contiguous area with relatively high demand for bike-share use.

Phase 3

Phase 3 of the proposed bike-share implementation plan expands from Phase 2 to include the outlying satellite neighborhoods of West Seattle, Columbia City, Holly Park, Rainer Beach, Bitter Lake, Lake City, and Northgate. Although we realize these neighborhoods are not directly connected to the proposed Phase 1 and 2 bike-share implementation areas, we feel these neighborhood centers have a relatively high bike-share demand and should be evaluated for potential inclusion after the system has matured and has demonstrated successful operation. It should also be noted that the Phase 3 areas along the existing and planned Sound Transit Link light rail alignment (Columbia City, Holly Park, Rainer Beach, and Northgate) could provide important connections between a bike-share system and regional transit hubs.

Program Size

Using Seattle trip-level travel data and bike-share industry standards, we calculated the demand for the number of bicycles and stations for each of the three recommended implementation phases. These figures are estimates and are designed to provide guidance for a potential bike-share program. Table 11 shows the low and high range estimates for daily bike-share trips, the number of bicycles, and the number of stations for each proposed phase of implementation.

Table 11: Demand Estimates for Phased Bike-Share Implementation

Market Area	Daily Trips		Number of Bikes		Number of Stations	
	Low	High	Low	High	Low	High
Phase 1 (Population 66,649)	2,616	5,459	793	978	53	65
Phase 2 (Population 156,429)	1,864	3,815	1,146	1,273	76	85
Phase 3 (Population 35,498)	284	575	356	375	24	25
Total	4,764	9,849	2,295	2,627	153	175

The proposed Phase 1 implementation area is 4.2 square miles and contains a population of 66,500 people. Although the area and population are relatively small in this phase, the number of daily trips is high because of the downtown's function as a regional urban center. This area is estimated to produce between approximately 2,620 and 5,460 daily bike-share trips. To accommodate these trips, it is estimated that a successful Phase 1 bike-share program would require between 790 and 980 bicycles and between 53 and 65 stations.

The proposed Phase 2 implementation area represents an additional 13.7 square miles and 156,400 people. This area is much larger and contains higher total population than the Phase 1 area, because it is largely residential development. This area is estimated to produce between 1,860 and 3,820 additional daily bike-share trips. To accommodate these trips, it is estimated that the Phase 2 implementation area would need between 1,150 and 1,270 bicycles and 76 and 85 stations. It is important to note the Phase 2 should incorporate knowledge and lessons learned from the operation of Phase 1.

The proposed Phase 3 implementation area represents an additional 4.5 square miles and 35,500 people. These areas are mostly residential and are estimated to produce between 280 and 580 additional daily bike-share trips. To accommodate these trips, it is estimated this phase should include between 360 and 380 bicycles and around 25 stations. A Phase 3 would be dependent on the success of Phase 1 and 2 implementations.

Policy Recommendations

Our findings suggest that there would be enough demand in areas of Seattle to support a bike-share system. Our findings also suggest that a bike-share program, for the most part, would conform to the City of Seattle's master plans. However, any organization intending to implement a bike-share program would need to address several legal, policy, and regulatory concerns.

We evaluated whether a bike-share program was compatible with Seattle's Bicycle Master Plan and concluded that bike-share will help directly meet several objectives of the plan. Similarly, we found that Seattle's curbspace management policy is generally supportive of bike-share as a curbspace use.

Bike-share supports, but also may conflict, with the goals of the city's Pedestrian Master Plan. In particular, the requirement for a six-foot pedestrian zone on sidewalks causes some potential problems. City staff should define the nature of a bike-share station and its elements, and interpret the impacts of stations on sign regulations and right-of-way requirements, before vendor selection. Because bike-share stations would be installed throughout the city, the installation process would be impacted by a variety of regulations linked to different special districts. Given this level of complexity, SDOT staff should help guide a bike-share provider through the permit process.

One challenge to the success of a bike-share program is the legal requirement that all bicycle riders in Seattle wear helmets. Ensuring helmet use by all bike-share program users will be difficult, and the City should be aware of all legal issues in advance. Subsidizing helmets through vouchers with bike-share subscriptions and/or at discounted rates at businesses in the bike-share implementation area may make helmet compliance easier for users.

Bike-share will support transit use, serving as the last-mile solution for transit users, potentially even increasing transit use. The City should work with Sound Transit and King County Metro on station placement near transit stops. The City should also work with King County Metro to provide bike-share membership to employees of large companies through the Commute Trip Reduction program.

Specifically, we recommend City of Seattle staff take action in the following categories:

Helmet Law

- ❖ Consult with legal staff on liability issues surrounding bike-share and helmet use
- ❖ Consider subsidizing helmets for online subscribers by providing them with a voucher for a free low-cost helmet from a local business
- ❖ Consider contracting a low-cost local helmet manufacturer to mass-produce and saturate the city with helmets for public use that can be obtained from businesses near bike-share stations
- ❖ Consider the implications of the selected helmet policy on the use of bike-share by tourists and non-residents of Seattle

Sign Code

- ❖ Define the nature of a bike-share station before dealing with a vendor
- ❖ Designate a staff person to guide a bike-share provider through the permit process
- ❖ Consider simplifying the permit process. For example, SMC 23.55.040 allows the Director of DPD to grant special exceptions to signs in the commercial and downtown zones

Seattle Bicycle Master Plan

- ❖ Accelerate implementation of bicycle infrastructure and network projects recommended or listed in the Bicycle Master Plan, especially within the proposed Phase 1 implementation area. These improvements will facilitate the success of a bike-share program in Seattle

Station Design

- ❖ Consider interpreting some elements of a bike-share station, such as the pay station, as similar to parking meters to allow for greater flexibility regarding station location
- ❖ Coordinate permit review to ensure that one station design will be acceptable throughout the city

Curb Space Management Policy

- ❖ Revise policy to specifically address bicycle and bike-share parking

Pedestrian Master Plan

- ❖ Consider bike-share station design requirements when revising pedestrian infrastructure requirements
- ❖ Be creative with station placement, exploring opportunities in plazas, on properties of private partners, etc
- ❖ Balance the interests of all users when allocating sidewalk and curbspace

Race and Social Justice and Bicycling

- ❖ Consider balancing potential implementation in the downtown core—where the

demand analysis suggests bike-share will be most successful — with the overall equity goals of the City

- ❖ Encourage bike-share ridership to low-income and culturally diverse populations through public education and outreach
- ❖ Provide bike-share information to service organizations within the proposed implementation area to encourage usage by low-income populations seeking services within the center city

Sound Transit and King County Metro Policies

- ❖ Further consult with Sound Transit and King County Metro once specific areas of implementation and station installation are identified
- ❖ Work with King County Metro to provide bike-share membership to employees of large companies through the Commute Trip Reduction program
- ❖ Coordinate with transit agencies to minimize bike/bus conflicts in downtown and ensure strong connections between bike-share and transit

Bike-Share System Framework

Vendor selection is a relevant policy concern. The vendor, and their associated system operating model and preferred equipment, will impact the style of bicycles and stations provided. We recommend a vendor that has fixed bike stations (as opposed to a flexible program without stations) to help with system visibility and greater public outreach and awareness. Modular fixed stations will permit system adjustments based on demand.

Public outreach and education is necessary before, during and after implementation of bike-share. Systems with higher rates of public “ownership” and buy-in due to outreach programs have reduced rates of theft and vandalism.

We also recommend that the City require any bike-share system operator to implement aggressive program monitoring and data collection to help guide system expansion and support accountability. Useful data includes operating performance, environmental impacts, user surveys, safety data, revenue performance, and travel patterns.

The following points are derived both from the analysis completed as part of this study and from our review of other successful systems in North America and Europe.¹¹⁷

Basic Bike-Share Program Model

- ❖ Select a fixed program because of the high visibility and potential for greater public outreach and education

117 Susan Shaheen, Stacey Guzman and Hua Zhang, “Bikesharing in Europe, the Americas, and Asia: Past, Present, and Future,” in Transportation Research Board Annual Meeting (Washington, D.C., 2010).

Check-Out Station Installation

- ❖ Use modular stations because of their ability to be adjusted according to observed demand, the ease of installation, and the low carbon footprint. Modular stations can also be scaled back or pulled offline during seasons of undesirable weather for cycling

Site Criteria and Placement of Stations

- ❖ Place bike-share stations 300 meters apart in the proposed Phase 1 implementation area and ensure there will be twice as many individual bike docks in the station network as there are bicycles in the system (two docks for every bike)

User Fee Structure

- ❖ Offer the option of a one-year subscription, a one-month subscription, and a one-day pass (aimed at tourists)
- ❖ Offer the first half-hour of use free of charge, with usage fees increasing for each additional half-hour. This will keep trip durations to 30 minutes or less and ensure there are more bicycles available for public use

Public Outreach and Education

- ❖ Work with the selected bike-share vendor to coordinate a large-scale public outreach and education campaign before, during, and after implementation of bike-share in Seattle. The public should be engaged in the planning process to the greatest extent possible
- ❖ Integrate the proposed bike-share program with local and regional transit and market the system as a compliment to these systems, not as a competitor
- ❖ Incorporate the ORCA card into the bike-share check-out process in order to facilitate the integration of bike-share with local and regional transit

Bike-Share System Components

Based on available data, we recommend that Seattle's bike-share program utilize the features and system components listed below, as these recommendations represent the industry standards and/or most recent advances in bike-share technology.¹¹⁸

Check-Out Stations

- ❖ Reliable alternative energy sources such as solar power, rather than subsurface power sources
- ❖ Real-time communication between stations and headquarters to report number of bicycles per station and facilitate redistribution
- ❖ Fully-illuminated stations for nighttime safety and visibility
- ❖ Space at stations for an illuminated map of station network and bicycle routes

Bicycle Docks

- ❖ State-of-the-art anti-theft mechanism
- ❖ Transactions can be made by smartcard, like ORCA, directly at bike dock for quick

118 Rolf Scholtz, interview by Max Hepp-Buchanan, Dero Bike Racks Interview, (April 27, 2009); Paul DeMaio, "Bikesharing: Its History, Models of Provision, and Future," in Velo-City Conference (Brussels, 2009).

check-out

- ❖ Capacity for user to identify and flag bicycles that require maintenance
- ❖ Indicator showing whether bicycle is available for use or out-of-service when system is shut down or individual bicycle needs repair

Payment Kiosks

- ❖ Can combine the functions of public bicycle check-out and payment for automobile parking in order to use available space most efficiently
- ❖ Accepts various forms of payment
- ❖ Easy access for people with limited mobility

Bicycles

- ❖ A frame that is light, strong, and durable
- ❖ One-piece handlebar that covers and protects all components
- ❖ All cables covered for better protection
- ❖ Derailleur integrated into rear axle (internal hub) for seamless shifting
- ❖ Chain protector integrated into bicycle structure that prevents riders' clothes from getting greasy or tangled in the chain
- ❖ Adjustable seat positioning to fit riders of all sizes
- ❖ Front and/or rear rack or basket for added carrying capacity

Making Bike-Share a Success

Our analysis has concluded that a bike-share program has the potential to be successfully implemented in Seattle. Our estimates reveal that there appears to be enough potential ridership demand to support a system initially implemented in downtown and nearby surrounding neighborhoods.

There are a number of institutional policy issues that need to be addressed before a program can be successfully implemented, though we believe they are manageable. These relate mostly to the King County helmet law and the Seattle sign code. Fortunately, it appears the City has the capacity to address these issues.

If the City does decide to implement a bike-share system, there are a number of specific actions listed in this report that City staff can take to ensure that bike-share infrastructure is installed in the most effective locations, will function efficiently, and will provide the maximum benefit to Seattle's transportation system.