City of **Redmond**
WASHINGTON

REDMOND, WASHINGTON
Bike Share Feasibility Study

alta
PLANNING + DESIGN

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Contents

1. Executive Summary

Now is an opportune time for bike share, and bicycling in general, to thrive in Redmond. The Transportation Master Plan was recently adopted. Redevelopment in downtown Redmond has created a new, walkable and bikeable community with thousands of new housing units, and many new open spaces and businesses. The future light rail station in the Overlake District, and eventually downtown Redmond, will provide enhanced mobility and tie the city more closely with downtown Bellevue and Seattle. Microsoft continues to improve its campus with new buildings, paths, and streetscapes and intends to launch bike share on its campus very soon. In Seattle, the Pronto Cycle Share network has completed its first full year of operations and will continue to provide mobility options for the city. Regionally, the future looks bright for bike share as the state legislature recently allocated $5.5 million in grant money for bike share on the Eastside. It is within this context that the City of Redmond Bike Share Feasibility Study was developed.

The intent of the Study is to determine the feasibility of launching bike share and to develop a system plan, station siting guidelines and a business plan for the City of Redmond. The business plan presents information on the proposed system size and phasing; outlines options for a business model that will be used to own, administer and operate the system; presents a five-year *pro-forma* financial plan for funding the system, and identifies operational considerations for the program. The analysis and recommendations in this study will inform elected officials, City staff, stakeholders, and the general public of the policies, bike infrastructure, and multi-modal transit and economic enhancements that may be needed to create a successful bike share program in Redmond.

The recommended system will consist of an initial launch of 28 stations with 252 bikes: 14 stations and 126 bikes at key locations downtown, and 14 additional stations in the Overlake/Microsoft campus area. An incremental second phase will increase the size of the network with a series of expansions totaling 12 additional stations and 108 bikes in the commercial zones to the southeast and northwest of downtown, and as additional infill in the Microsoft campus area.

The high-density, mixed use redevelopment along the Central Connector provides a solid base of demand for bike share in Downtown Redmond

Station sites will include a mixture of sidewalk and on-street sites at an average spacing of approximately one station every ¼ mile, with some stations at the edges up to ½ mile apart. This density provides access to a bike within a short walk of anywhere in the service area (including key destinations) and provides a nearby alternative to return a bike if the destination station is full. Consistent with Seattle's Pronto bike share system, Redmond's is expected to be a year-round program.

Phase 1 and 2 is expected to cost $5.8 to $7.0 million over five years—depending on selected equipment and technology—including capital, launch, and operating costs. Projected revenue of $170,000 (year 1) to $310,000 (year 5) per year will provide a portion of the operating fees, but a projected $2.2 to $3.0 million funding gap will need to be defrayed over the five-year period. Gap funding will primarily come from three or more sources: station sponsorship, additional grants, and potentially advertising revenues and/or City funding. It is also important to note that because a significant portion of the planned network in the Overlake District will sit within or adjacent to Microsoft's campus, it is expected that the company will defray the primary costs to purchase and operate the portion of the system that benefits their staff and visitors. Because this study's recommendation is for City of Redmond ownership of the equipment, Microsoft will likely lease the equipment serving their campus (and the Overlake Transit Center) and fund operations through a sponsorship agreement with the City.

This study recommends that a pricing structure mimic the one used by most other bike share programs in the U.S. including Pronto's in Seattle, i.e. unlimited 30-60 minute trips for designated members. Members will be able to access the system for a recommended cost of $85 for an annual membership, $16 for a three-day pass and $8 for a 24-hour pass. Members will be able to take as many trips as they like with the first 30 minutes free, after which a graduated pricing scheme charges users for longer trips. This pricing schedule is based on the likely expansion of Seattle's Pronto Cycle Share program to the Eastside. However, if different equipment were chosen, such as a smart-lock equipment, a pricing scheme based on a "pay as you go" model, where users pay by the minute or by the trip, could be possible. From inception to launch, the 28 station, 252 bike first phase will take 8-18 months to implement.
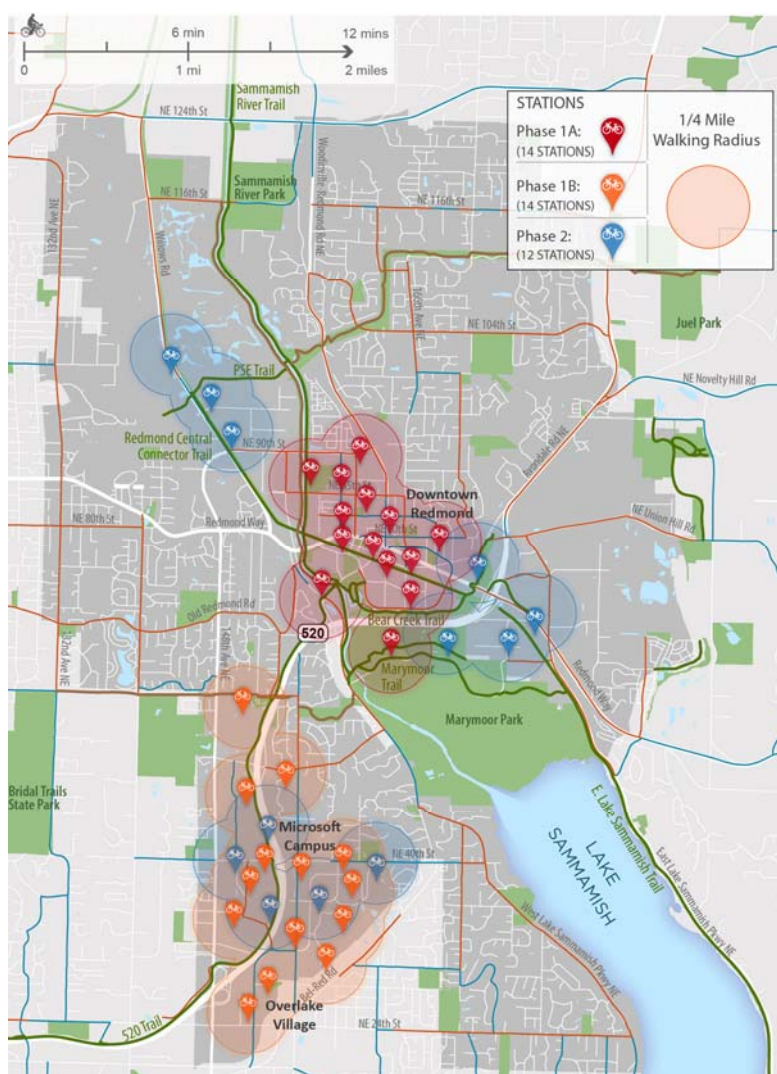
Recommended Bike Share System Map for Phase 1 and 2

2.   What is Bike Share?

Bike share is designed to provide a cost-effective, environmentally-friendly and convenient travel option for many short trips. A bike share system consists of a fleet of user-friendly and durable bikes placed at conveniently-located stations throughout an urban area. Bike share is a relatively inexpensive and easily implementable infrastructure extension to a city's public transportation system.

Bike share systems are typically structured to operate like automated bike rental for short periods. The structure encourages shorter, spontaneous trips in which bikes are checked out, ridden for a short period of time (typically 30 minutes or less) and returned to any station in the system for others to use. Most systems employ a pricing schedule that encourages short, frequent trips and discourages bikes being in use for long periods of time. Some systems provide for unlimited, short trips for casual (24 hour) users or annual/monthly members—so-called "buffet" style of pricing—while others charge for each trip or each hour of use—so-called "ala carte" pricing. For either pricing model, the focus is getting to nearby destinations quickly and conveniently. Generally, it is not intended to compete with bike rental companies, which are intended for those interested in using a bicycle continuously for longer periods of time.
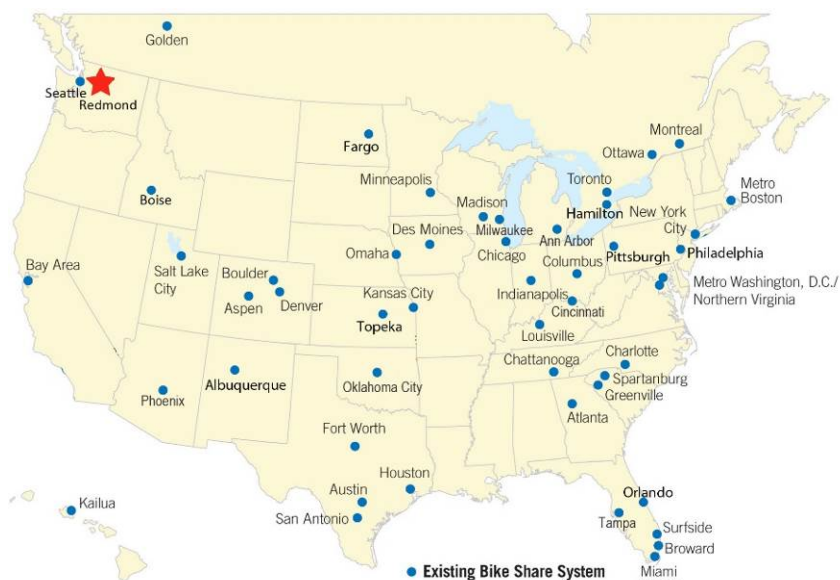
Figure 1: Current North American bike share systems

As of the end of 2015, nearly 30 of the 50 most populous U.S. cities had a functional bike share system, a 600% increase from 2010, when only five of these cities had bike share systems. Nearly all of the 50 largest U.S. cities are in the process of studying or launching a system. Bike share is quickly becoming a mainstream form of travel in mid-size and large cities across the U.S. Smaller cities are also adopting bike share, as numerous bike share programs exist in cities with fewer than 150,000 residents

Evolution of Bike Share Technology

Bike share is not a new concept, and in fact, has been around for decades. Most of the first generation "systems" were volunteer-led and informally organized in a handful of cities, such as Portland, Oregon. These programs experienced low to moderate success because of theft, vandalism, inefficient technology and insufficient operational oversight. However, in the past five to ten years, innovations in technology have increased user accountability and given rise to a new generation of technology-driven bike share

programs. Advancements in credit card transaction capabilities and RFID (radio-frequency identification) chips have allowed operators to introduce accountability and reduce theft and vandalism.

Recent bike-share technologies, developed in North America, have produced modular systems that use solar power and wireless communication. With these technology advances, stations can be moved, relocated, expanded, or reduced to meet demand. This allows a flexible system in terms of service coverage and availability, and helps reduce capital costs related to construction.

Bike share technology continues to evolve quickly along with other wireless and digital changes. Other recent advancements include systems that do not require docking stations (i.e. "smart lock" systems) and electric-assist bikes. Smart lock systems are still relatively new and have yet to show their resiliency over a multi-year period, like the dock-based systems. Both options are sometimes referred to as "4th Generation" bike share. The near future may also bring a unified transit and bike share pass, of which a number of cities are interested in implementing. Finally, operations have evolved from volunteer-led and informal, to sophisticated and formal, with significant investments in customer service, marketing and maintenance, deployment and rebalancing (i.e. moving bikes from full to empty stations).

Figure 2: Elements of a 4th Generation Dock-Based Bike Share System (similar to Seattle Pronto)

A software back-end that keeps track of transactions and ridership information and can be linked to real-time website and mobile device applications and user profiles that report the number of trips, distance traveled, calories burned and other information.

A fleet of bicycles - specially designed for short trips and constructed of customized components to limit their appeal to theft and vandalism

A network of stations spread across a broad area to provide convenient access to bikes. Each station includes a terminal where transactions are made and docking points where the bicycles are secured when not in use. Recent technologies have introduced modular station platforms that can be relocated, expanded, and have solar power and wireless communications.

Maintenance: Staff and programs to rebalance bikes amongst the stations and maintain the infrastructure

Figure 3: Elements of a 4ᵗʰ Generation "Smart Lock" Bike Share System

Digital screen to receive unlocking code

Key pad to insert unlocking code or other information

Integrated U-Lock intended to be taken with bike when ridden so that bike can be locked anywhere (typically for a higher fee than parking the bike at a station)

Bike Share Bicycle

Docking station with space for custom branding and advertisements. A kiosk can be added at station to process bike rental transaction. Since bikes can be rented via mobile device and online, not all stations require a kiosk.

Evaluation of Technology Options

While both technology options shown above have key strengths and weaknesses, ultimately, only one option will be selected for Redmond's bike share program. To determine which type of system is most appropriate for the City's needs, it is helpful to weigh the pros and cons of each. The key criteria for success include the following:

Criterion	Dock-based Equipment	Smart-lock Equipment
Bicycle/Station Durability	40+ pound bike with proprietary components and internal cables to reduce vandalism; puncture proof tires	40+ pound bike with proprietary components to reduce vandalism (exposed cables); puncture proof tires
Interoperability with Regional Programs	Dock-based equipment provided by PBSC from Quebec or Motivate from NYC are compatible with Pronto docking stations	Not compatible with Pronto system
Ease of Use	Requires a key fob or swipe card for member access; casual users require interaction with transaction kiosk	Members use RFID card or punch-in access code onto bike-mounted interface; casual users require interaction with transaction kiosk
Level of Visibility within the Context	Highly visible stations within the urban context, whether on-street or sidewalk	Highly visible stations within the urban context, whether on-street or sidewalk
'Brandability' of	Branding space on rear fender, front	Branding space on rear fender, front

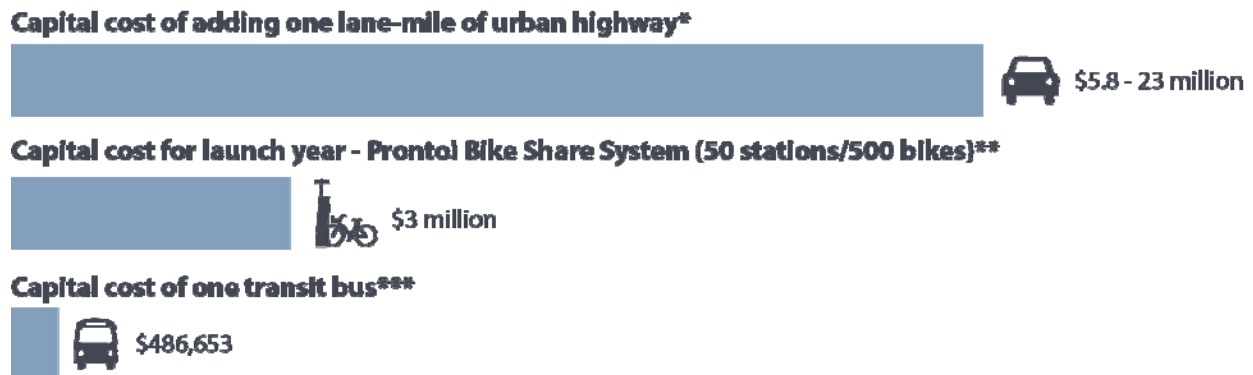| Equipment	basket and the kiosks that are required at every station	basket and kiosks (though some stations may forego kiosk)
Site Planning and installation issues	Heavy steel plates require small crane for installation of station docks	Bike park at analog bike racks mounted to small plate; no crane required
Sustainability (solar power, wifi, local/domestic production)	All vendor options use solar power and are wifi enabled; some products are manufactured in U.S. and Canada (including Pronto equipment)	All vendor options use solar power and are wifi enabled; limited production in U.S. and Canada (more typically Europe or China)
Track Record of Existing Systems	Most large and mid-size cities use dock-based equipment with generally high levels of success and popularity	Limited deployment in roughly a dozen cities of various sizes; generally well received but few systems have been operational for more than a year
Equipment Costs	Typical station with 8-10 bikes: $45,000 to $55,000	Typical station with 8-10 bikes: $25,000 to $35,000 (low end if optional kiosk is not incorporated)
Operational Cost	Typical costs are roughly $2,000 per bike, annually (some up to $3,000 per bike)	Typical costs are roughly $2,000 per bike, annually
Electric Assist (i.e. "pedelec" bikes)	On-going development; limited number of systems in European cities, plus 25% of Birmingham AL fleet is pedelec	No current smart lock systems use electric assist for all or some of their fleet

3.   Benefits of Bike Share

Bike share has been transformative for many cities in North America. This section provides a summary of some of the financial, health, transportation and safety benefits that can result from a successful bike share system.

Financial Benefits

Bike share is a relatively inexpensive and quick-to-implement urban transportation option compared to other transportation modes. As shown in Figure 4, the relative cost of launching a bike share system is several orders of magnitude less than investments in other transportation infrastructure, such as public transit and highways.

Figure 4: Relative Cost of Transportation Investments

Capital cost of adding one lane-mile of urban highway*

$5.8 - 23 million

Capital cost for launch year - Pronto! Bike Share System (50 stations/500 bikes)**

$3 million

Capital cost of one transit bus***

$486,653

*Rails to Trail Conservancy Fact Sheet. http://www.railstotrails.org/resources/documents/whatwe-do/policy/20Mile%20fr%20widening%20and%20new%20construction.pdf
**Data provided by the City of Seattle
***American Public Transportation Association. Table 22: U.S. Average New Vehicle Costs for 2012 and 2013 Vehicle Type. http://www.ap-ta.com/resources/statistics//table22_vehcosttransitlength2013.pdf

Bike share systems are funded through a variety of sources. To best understand the funding structure, it makes sense to separate bike share costs into three areas:

1. **Capital:** hardware (stations and bikes) and software
2. **Deployment:** Procurement, assembly, and deployment of the hardware and software; hire and train staff; set up website and member systems.
3. **On-going operations**:

    - Data analysis and reporting
    - Bicycle rebalancing
    - Bicycle maintenance
    - Station maintenance and cleaning
    - Member services
    - Community partnerships

Currently, there is a spectrum of funding that includes public funding, grants, sponsorship, advertising, user revenues, and developer investment. Many cities use a combination of funding sources to invest in both the up-front capital costs and pay for the on-going operations.

On one side of the spectrum is New York's Citi Bike, which funded the up-front capital and deployment costs through private-sector financing and sponsorship commitments from Citibank and Master Card. On-going operations are funded through private sponsorship and user fees with no government funding. Another example is DecoBike in Miami Beach, which was set up by a private vendor who fully funded the capital and deployment costs. Operations are paid for via user fees and advertising on the bikes and stations. On the other side of the spectrum is Capital Bike Share in Metro Washington DC, which used federal grants and local municipal funds to invest in the up-front capital costs and launch fees. On-going operations are funded through user fees, local funds, and sponsorship opportunities.

All other systems have used a combination of various funds – both public and private – to fund capital costs, deployment, and on-going operations, with the mix depending on a variety of factors. Most use user fees (e.g., memberships, casual use passes and overtime fees), sponsorship and/or advertising. Many systems have some level of government support while still others—such as Chattanooga and Columbus—subsidized operations for a fixed period of time then moved to a revenue and sponsorship-driven model. Some have used government funds to initiate the system development, and have brought in sponsors and advertisers later. Two of the more established systems—Nice Ride in Minneapolis and Denver B-Cycle—benefitted from initial foundation support. In the case of Denver, money left over from that City's hosting of the 2008 Democratic National Convention was used for seed money for the bike share system. In general, a mix of public and private funding sources is typically leveraged to deploy and operate bike share systems, and the allocation of funding sources differs from system to system. The appropriate funding mix is informed by system location. Systems in larger cities have access to large corporate donors, while systems in smaller cities/regions typically need to solicit funding from a greater diversity of funding sources to cover deployment/operations costs, with some exceptions.

Bike share systems in the U.S.—especially in the larger cities—have performed relatively well in terms of "farebox recovery," meaning the percentage of operating cost recovered by user revenues is high compared to other forms of public transportation. The average farebox recovery for U.S. metro transit systems is 37.7%. Locally, average farebox recovery of Sound Transit is 23%, King County Metro is 28%, and state-wide average farebox recovery is roughly 14% in Washington State. Bike share farebox recovery ranges from close to 100% (Capital Bikeshare in Washington DC and Divvy in Chicago) to lower amounts such as approximately 40% in Boulder, CO and 15% in Chattanooga, TN. Part of the reason for Capital Bikeshare or Divvy's high rate is the large number of tourists who purchase the more lucrative one-day passes (relative to the annual member fees) and pay overtime fees.

Where user fees do not cover the cost of operating the system, cities have used sponsorship or public funding to cover the full cost of operations. It should be noted that many bike share programs are less than three years old and it is too soon to truly understand farebox recovery in the long term (or other financial sustainability issues). Many systems do not expect to self-finance operations. Cities use different accounting approaches and few have released this information to-date.

Other financial and economic development benefits of bike share can include:

- **Infilling a city's transit system/Last mile connectivity.** When sited adjacent to key transit hubs and bus stops, bike share helps to fill in the gaps between transit lines and stations. This provides enhanced "last mile" connections between a transit stop and one's home or place of employment. Within many of the prominent U.S. bike share systems are numerous multi-modal hubs that contain bike share stations at subway stops, light rail stations, and bus hubs.
- **Enhance a city's image.** Systems can become an attraction for residents, employees and visitors. They can also generate positive local and regional media exposure that would otherwise be difficult or costly to generate.
- **Job creation.** On-going positions for operating the system provide a benefit to the local economy
- **Businesses can benefit from improved access to their stores.** Customers and employees can use bike share as an inexpensive transportation option for commuting or running errands. A 2014 Capital Bikeshare user survey found that 67% of all induced trips (i.e. a trip otherwise not made without bike share as an option) were made by people "more likely" to patronize businesses proximate to bike share stations.
- **Bike share stations can provide space for brand development for local businesses.** Depending on the technology and operating model for a system, space on the bike and the stations will likely be provided for sponsorship.
- **Reduced transportation costs for household budgets.** Like public transit, bike share can help some households eliminate the need for a vehicle or an extra vehicle.

Bicycling, and in particular bike share, is an affordable form of transportation relative to other options. The cost of using a bike share bike for a year can be as low as the annual membership fee, which is typically between $65 and $85 per year for similar cities, compared to $6,000 for annual ownership and operation of a personal vehicle, or between $216 to $2,268 annually to ride King County Metro (KCM) and Sound Transit (ST) services (depending on average distance travelled). Figure 5 compares the annual user costs for various transportation modes available in the Redmond area.

Figure 5: Annual User Cost for Various Transportation Modes

Ownership and operation of a personal vehicle*

$6,058

ORCA Card (twelve 1-month passes)**

$216 to $2,268

Bike Share Membership***

$65 – $85
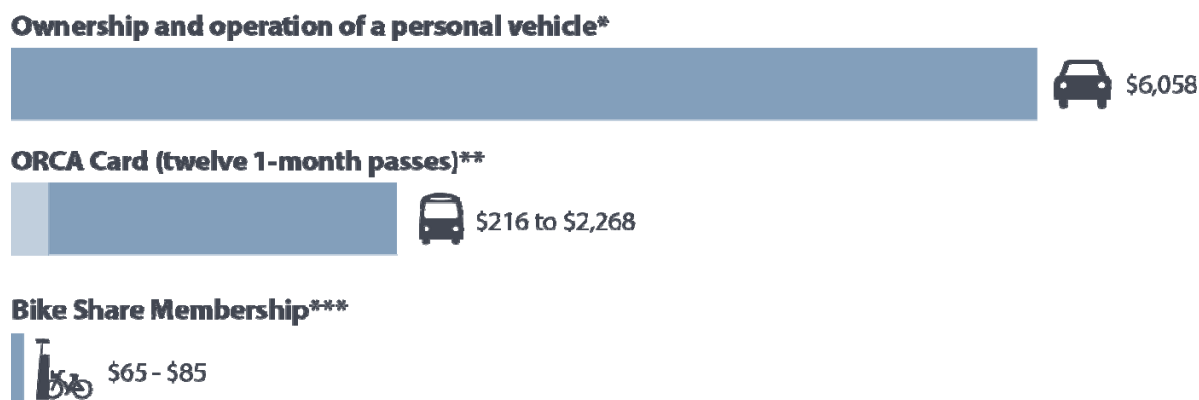
*U.S. Department of Transportation Research and Innovative Technology Administration, Bureau of Transportation Statistics. Average Cost of Owning and Operating a Vehicle Assuming 15,000 Vehicle Miles per Year. http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/national_transportation_statistics/html/table_03_17.html

**Sound Transit ORCA Card Fares and Passes; http://www.soundtransit.org/Fares-and-Passes/ORCA-card

***Range for similar cities (Denver, CO; Madison, WI; Chicago, IL; Columbus, OH; Seattle, WA; per the bike share system's websites. The $65-$85 range does not include potential overtime fees (>30-45 min/trip) which annual members typically minimize (whereas day users more-frequently pay overtime fees)

Health Benefits

The health benefits of bicycling are well recognized and include the potential to reduce obesity, heart disease, and other sedentary lifestyle diseases. The goal of increased physical activity and healthier lifestyles is being propelled locally by the Redmond Pedestrian-Bicycle Advisory Committee and the Cascade Bicycle Club, organizations that work to advance projects that improve non-motorized transportation in Redmond and the Puget Sound Region.

In Washington, levels of obesity and physical inactivity are both significant public health issues. The Center for Disease Control reported that as of 2015, 27.2% of adults in Washington were obese and 34.3% were overweight.[1] The same survey report also noted that 20% of adults in Washington reported that during the past month, they had not participated in **any** physical activity, and 43.7% of adults participated in less than 2.5 hours of aerobic physical activity per week.

The Robert Wood Johnson Foundation's *County Health Rankings and Roadmaps* report lists King County as having 22% of its adult population as obese and 15% identified as physically inactive.[2] The recommended amount of physical activity for adults is 150 minutes per week or 20-30 minutes of moderate physical activity each day. **Because average bike share trips are just over one mile at relatively slow speeds, the typical 20 minute trip can help people get this needed physical activity as part of their daily commute or travel pattern.**

Figure 6: 2012 Self-Reported Obesity Prevalence among U.S. Adults*
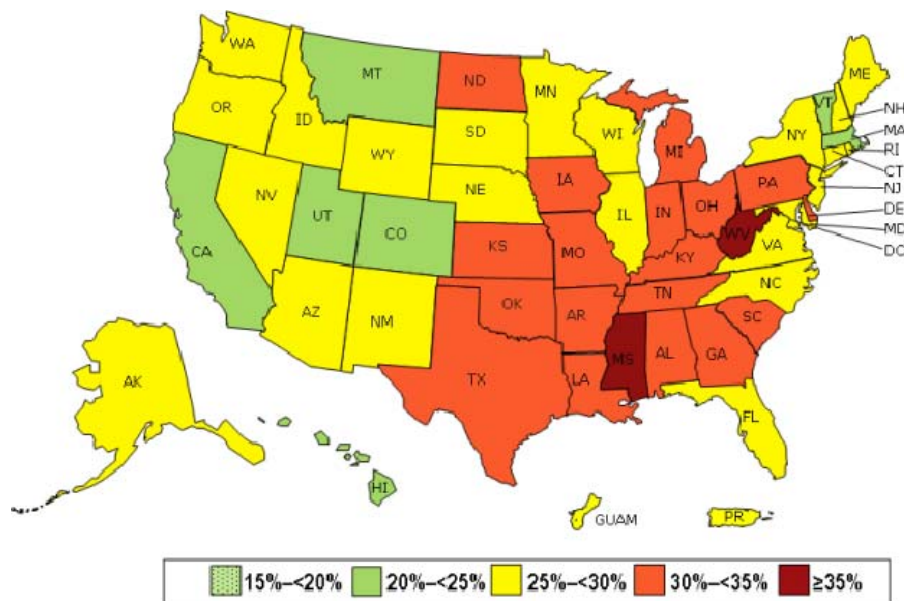
*Source: Center for Disease Control and Prevention. Behavioral Risk Factor Surveillance System, 2012. http://www.cdc.gov/obesity/data/adult.html

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[1] Source: Washington State Nutrition, Physical Activity and Obesity Profile. 2015. National Center for Chronic Disease Prevention and Health Promotion. 2015.

[2] http://www.countyhealthrankings.org/app/washington/2015/rankings/king/county/outcomes/overall/snapshot

In addition to personal health, several health care providers have recognized the benefits of bike share and have committed resources to deploy and operate systems. Health care providers such as Seattle Children's Hospital, Kaiser Permanente, Allegheny Health Network, Blue Cross Blue Shield, and Humana have provided sponsorship or other financial support for bike share systems. Some example systems include Pronto Cycle Share in Seattle, Nice Ride Minneapolis, and Charlotte B-Cycle. Blue Cross Blue Shield of Illinois recently became the Chicago Divvy system's largest corporate sponsor, providing $12.5 million over a five-year period.

Transportation/Mobility Benefits

Bike share provides additional transportation options for short urban trips for residents and visitors. Figure 7 illustrates how bike share fills an existing gap between trips too far to walk, but perhaps not long enough to justify waiting for a bus or the cost of driving or catching a taxi.

Figure 7: Urban Trip Modes
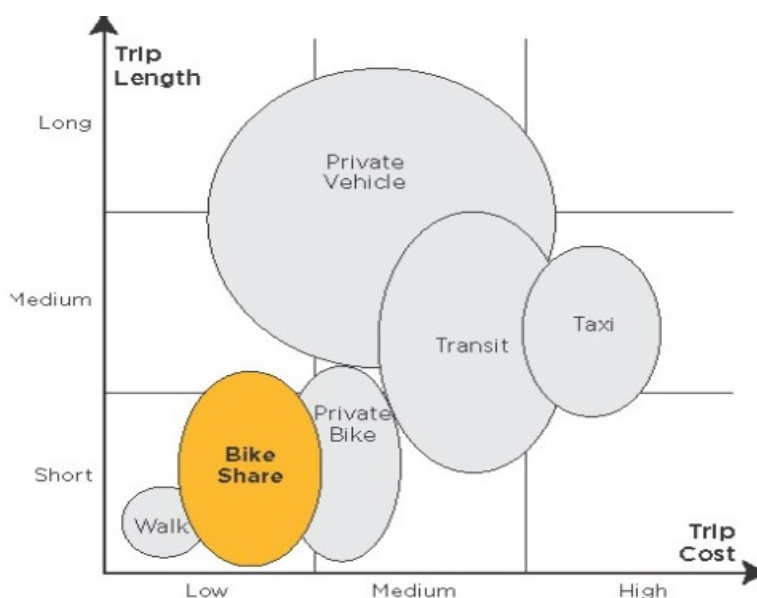
Bike share can also:

- **Reduce reliance on private automobiles.** Initial experience in North American cities has shown that between 5%-25% of bike share trips replace a motor vehicle trips.
- **Extend the reach of transit** by providing a first and last-mile transportation solution, and by providing service to under-served areas or areas that do not justify the cost of other transit options.
- **Encourage more bicycling.** According to a 2013 study from the Mineta Transportation Institute, over 70% of surveyed users in Minneapolis, Toronto, Montreal and Washington DC stated that they bicycle more since subscribing to bike share.
- **Introduce people to cycling that do not typically ride.** The 2012 user survey in Minneapolis showed that approximately one-third of system users cycled less than once per month prior to signing up for Nice Ride.

- **Reduce barriers to cycling.** Bike share makes bicycling convenient - there is no need to own or store a personal bicycle or worry about locking your bike or having it stolen. In 2013, 40% of Capital Bikeshare survey respondents reported that they would not have otherwise made the trip in the past month, and almost 10% reduced their driving miles by using bike share.

Analyzing current bike and walk mode share trends is helpful in understanding how people are travelling. In Redmond, walking is 50% above the national average walk mode share of 2.8%, and bicycling commute rates in Redmond are 100% higher than the national average bike mode share of 0.6%. **Bike share can help increase cycling rates to work by providing walkers with an alternative non-motorized option. Bike share is also a complimentary mode of transportation to bus transit and can expand the geographic coverage for transit riders.** With the right planning and promotion, bike share could even encourage some to choose to bike instead of driving. Table 1 highlights the commute rates for walking, bicycling, and public transportation relative to other travel options and compared to state and national rates.

Table 1: Walking, Biking and Transit commute rates in the US, Washington, King County and Redmond

Commute	U.S.	Washington	King County	Redmond
Drove Alone	76.3%	72.7	65.2	70.9
Car Pool	9.8%	10.6	10.3	10.5
Public transportation (excluding taxicab):	5.0%	5.8	11.4	6.9
Bicycle	0.6%	.9	1.5	1.2
Walked	2.8%	3.5	4.5	4.2
Taxicab, motorcycle, or other means	1.2%	1.2	1.1	0.8
Worked at home	4.3%	5.4	5.9	5.4

Source: U.S. Census Bureau, 2009-2013 American Community Survey 5-Year Estimates

Safety Benefits

To date, bike share systems have observed an exemplary safety record. **In North American systems, few serious injuries and only one fatality have been reported out of more than 50 million trips.** In Washington DC, a total of 14 crashes were reported in the first year of operation, of which only one was serious in nature. Approximately one million trips were made during this same period for an injury crash rate of 0.83 injuries per million miles (the average trip length was approximately 1.2 miles per trip), which is lower than the injury rate of 7.3 injuries per million miles ridden for private bicycling in Washington, DC. At the end of 2015, Citi Bike in New York City has had over 22 million trips without a single fatality and less than 120 crashes that required trips to the hospital.

Some of the factors contributing to this safety record could include:

- The **"safety in numbers"** effect and increased driver awareness due to increased media; increased number of cyclists on the street; and because more drivers use the bike share system or own a bicycle.
- Nearly all bike share **bicycles are designed for the rigors of constant use in an urban environment**. As such, they are far heavier than most bicycles and are relatively slow to ride. The typical 3-speed hubs are geared low, thus most riders travel at speeds of roughly 10 mph. These slower speeds improve the safety record for bike share.
- The **safe design of the upright-position bicycle** fitted with internal safety features such as wide, puncture-proof tires, drum brakes, generator-powered lights and a bell. The bikes are also regularly inspected to ensure that all safety features are in proper working order (see Figure 8, below).

Figure 8: Safety and other features of typical bike share bicycles
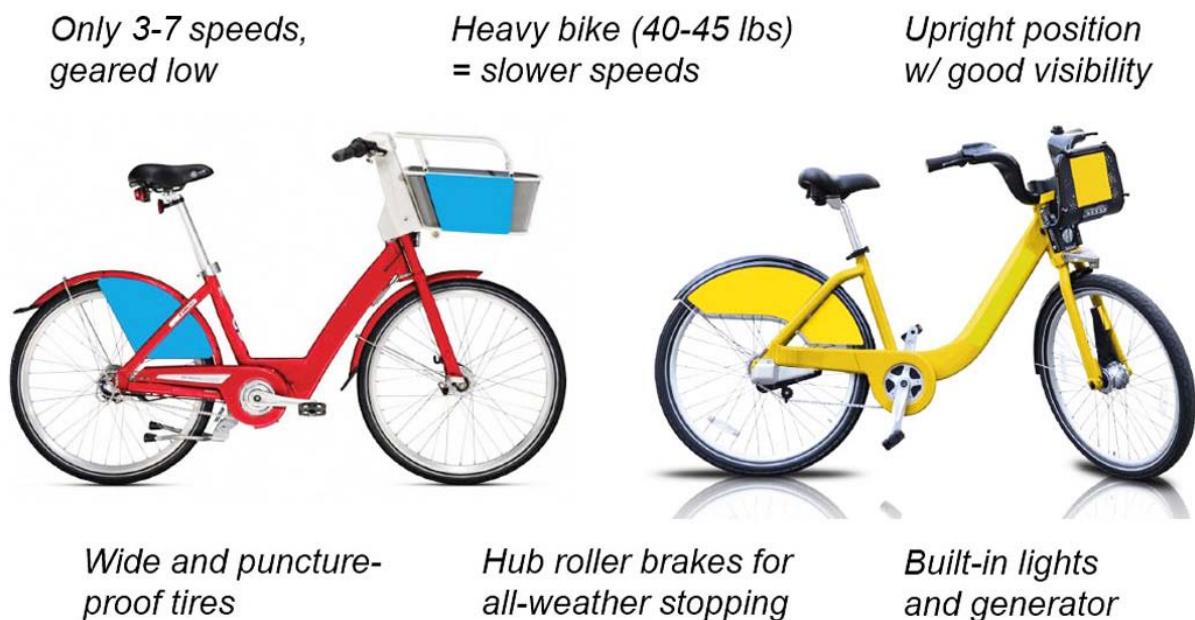
4.   Bike Share System Case Studies

Many cities in the U.S. have invested in bike share systems for the reasons outlined above. The relative success in these cities has dramatically increased the visibility of bicycling and increased activity and investment in bicycling overall.   Bike share systems in the U.S. are diverse and include different generations of technology, varying fee structures, funding strategies and operational models.

To provide a snapshot of how peer cities have approached bike share, several case studies have been compiled. The examples include both core systems themselves, but also urban areas outside of the system core. The latter is intended to roughly approximate Redmond's relationship with Seattle. The examples include:

- Pronto Cycle Share in Seattle
- Capital Bikeshare in Arlington County VA (part of Metro Washington DC system)
- Boston Hubway in Cambridge and Somerville (part of the Greater Boston system)
- Topeka, KS Metro Bikes
- Boulder, CO B-Cycle

These systems include a mix of dock-based and smart lock-based bike share systems, supplied and operated by various equipment vendors. The Topeka system was chosen to highlight a medium-sized city-wide example of a smart lock system (called SoBi) that is more flexible and has less capital costs compared to station-based systems. Although relatively untested at a city-wide scale compared to dock-based systems, the smart-lock option offers the potential benefit of lower capital costs and the ability to park and retrieve a bike anywhere in the service area. This type of system is growing in popularity, and the technology of such systems is improving rapidly, furthering their appeal.

Seattle, Pronto Cycle Share

System Type/Equipment Provider
Dock based/Arcade bicycles with 8D stations and software

Launch Date
October 2014

Size
At launch: 50 stations / 500 bikes.

Community Characteristics[3]

- Total Population: 668,342 (2014 estimate)
- Population Density: 7,962 people/sq mi (2014 estimate)
- Employment Density: 6,254 employees/sq mi
- Cost of Parking Downtown: $22.70 (average daily rate)

Funding
$750,000 Federal grant plus sponsorship funds ($500,000 per year x 5 years) from Alaska Airlines, with $500,000 from Seattle Children's Hospital and various station sponsors.

Management
Owned by a new non-profit named Puget Sound Bike Share, with operations by Motivate, a private vendor. Ownership will soon transition to the City of Seattle.

Pricing
- $85 annual membership
- Casual Users: $8 for 24-hour pass
- Casual Users: $16 for 72-hour pass
- All users: first 30 minutes free, $2 for next 30 minutes, $5 for every 30 minutes after first hour

Access
- Annual members receive an electronic key fob, allowing them to check out bikes directly from dock.
- Casual users can check out bike from the kiosk using a credit card and agreeing to a waiver.

System Performance:
- After first full year of service (Oct 2014-Oct 2015), Pronto averaged 0.8 daily trips per bike
- Operations costs covered by user fees, aka: "Farebox Recovery" rate: 60-70% (estimated)

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[3] Total Population and Population Density sources 2010 US Census, 2013 LODES; Employment Density source Longitudinal Employer Household Dynamics; Cost of Parking source www.parkme.com

Arlington County VA, Capital Bikeshare (CaBi)

System Type/Equipment Provider
Dock-based/Public Bike Share Company

Launch Date
2010

Size (Arlington County Stations Only)
- Current: 81 Stations
- At Launch: 57 Stations
- 3000 bikes are shared between the Arlington County stations and the rest of the CaBi network

Community Characteristics:4

- Total Population: 226,908 (2014 Estimate)
- Population Density: 8,737/sq mi (2014 Estimate)
- Employment Density: 5,104 employees/sq mi
- Cost of Parking in Arlington: $10.70 (average daily rate; parkme.com)

Funding
Federal grants received by the County.

Management
Private & Non-profit partnership; Arlington Transportation Partners is a for-profit agency that provides TDM services for the greater Washington D.C. area has partnered with a local non-profit Bike Arlington. The system is operated by Motivate, Inc.

Pricing
- $85 Annual Membership
- $28 30-day pass
- Casual Users: $10 Initial Day Key Pass + $7/Day
- Casual Users: $17 3-Day Pass
- Casual Users: $8 Day Pass

Access
- Annual members receive a station key that allows them to check out bikes directly from the dock.
- Casual users will be able to receive a code from one of the kiosks, which will allow them to check out the bikes directly from the docks.

System Performance:
- Unknown number of trips per bike
- Operations costs covered by user fees, aka: "Farebox Recovery" rate: 90%+ (estimated)

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4 Total Population, Population Density & Employment Density source 2010 US Census , 2013 LODES; Cost of Parking source www.parkme.com

Cambridge and Somerville MA, Hubway

System Type/Equipment Provider
Dock-based/Public Bike Share Company

Launch Date
2012

Size

    Entire System

- Current: 1300 bikes / 140 stations
- At launch: 600 bikes / 60 stations

    Cambridge and Somerville Only

- Current: 45 stations
- At launch: 28 stations

Community Characteristics Somerville & Cambridge Combined:[5]
- Total Population: 207,510 (2014 estimate)
- Population Density: 17,953 people/sq mi. (2014 estimate)
- Employment Density: 11,565
- Cost of Parking in Somerville/Cambridge: $20.50 (average daily rate; parkme.com)

Pricing
Federal grant for Capital costs; sponsorship (Cambridge) and city money (Somerville for operations)

Management
Public-private partnership (Owned by multiple municipalities and operated by Motivate, Inc.)

Cost
- $85 annual membership
- $20 monthly membership
- Casual users: $6 24-hr pass; $12 72-hr pass
- All users: 1st 30 minutes included, varying additional charges for additional time

Access
- Annual Members receive a Hubway card that allows them to check out bikes directly from dock
- Casual users can check out with a 5-digit code that they receive at the kiosks

System Performance:
- Hubway in Cambridge and Somerville averaged 2.5 daily trips per bike in spring 2013
- Operations costs covered by user fees, aka: "Farebox Recovery" rate: 75% (estimated)

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[5] Total Population and Population Density sources 2010 US Census, 2013 LODES; Employment Density source Employment and Wages (ES-202), Executive Office of Labor and Workforce Development, 2013; Cost of Parking source www.parkme.com

Topeka, KS Metro Bikes

System Type/Equipment Provider
Smart Lock/Social Bicycles (SoBi)

Launch Date
April 2015

Size
100 bikes / 10 stations / 4 kiosks

Community Characteristics:[6]

- Total Population: 127,215 (2014 estimate)
- Population Density: 2,114 people/sq. mi. (2014 estimate)
- Employment Density: 1,918 employees/sq mi
- Cost of Parking in Topeka: $6.00 (average daily rate; parkme.com)

Image Credit: Topeka Capital Journal

Funding
Federal and state grants, Topeka Metro, and sponsorships

Management
Owned and operated by Topeka Metro

Cost
$25 annual membership, with two hours of "free" use per day and $2.50 after
Casual users: $2.50 per hour
All users: $3 to park a bike outside of stations or approved bike racks; $2 credit to return a bike to an approved parking location

Access
Reserve a bike using mobile app, online, or at the bike using its keypad, and receive a 4-digit PIN code to unlock the bike. Option to hold the bike by pressing the "HOLD" button (for running into a store or café during the trip); reenter 4-digit PIN to unlock again. Pricing encourages the bikes to be parked at established hubs but can be parked anywhere within the service area for an additional $3 fee.

System Performance:

- From April through July 2015, Topeka Metro Bikes averaged 0.6 daily trips per bike
- Operations costs covered by user fees, aka: "Farebox Recovery" rate: Not Available

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[6] Total Population and Population Density sources 2010 US Census, 2013 LODES; Employment Density source Bureau of Labor Statistics; Cost of Parking source www.parkme.com

Boulder, CO B-Cycle

System Type/Equipment Provider
Dock Based/B-Cycle

Launch Date
2011

Size
- Current: 275 bikes / 39 stations
- At launch: 85 bikes / 12 stations

Community Characteristics:[7]
- Total Population: 105,112 (2014 estimate)
- Population Density: 4,262 people/sq. mi. (2014 Estimate)
- Employment Density: 3,359 employees/sq mi
- Cost of Parking in Central Boulder: $10.60 (average daily rate; parkme.com)

Image Credit: Boulder B-Cycle Website

Funding
Federal, state and local government grants, private funding and foundation grants ($1.25 million – 85% grants / 15% donations)

Management
Owned and operated by a non-profit

Cost:
- $70 annual membership ($45 for student pass)
- $20 weekly
- $8 daily pass; first 60 minutes free, $4 for each additional 30 minutes

Access
- Annual Members receive a B-card that allows them to check out bikes directly from dock
- Casual users can check out from the kiosk (as can members if don't have B-card but need to use same credit card used to purchase membership)

System Performance:
- In 2014, Boulder B-cycle averaged 0.7 daily trips per bike for the year; from January thru October of 2015, the average is roughly 1.0 daily trips per bike

- Operations costs covered by user fees, aka: "Farebox Recovery" rate: 40% (estimated)

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[7] Total Population and Population Density sources 2010 US Census, 2013 LODES; Employment Density source Longitudinal Employer Household Dynamics; Cost of Parking source www.parkme.com

5. Program Goals and Interest in Bike Share

The goals of Redmond Bike Share Feasibility Study were developed through a collaborative process with the project Steering Committee. The goals are intended to help municipal, county, and regional leaders and key stakeholders **measure success** and help **raise funds** necessary for capital, deployment, and operation of a city-wide bike share system. The goals will also inform system-wide planning efforts.

Measuring Success – There are various ways to measure success of a bike share program, such as:

- Levels of use (typically measured in trips per day per bike)
- Number of miles traveled
- Number of annual members and day users
- Geographic distribution of annual members
- System safety based on reported crash and injury incidents
- Revenue generation
- User experience (e.g., well-maintained bicycles, quality of user experience and/or customer service)
- Level of corporate/institutional support and sponsorship

Fundraising – The goals can help raise funds for equipment and on-going operations. For instance, prioritizing enhancements to public transit or reduction of vehicle miles traveled could make the study area eligible for certain Federal funding and grant programs. Or, prioritizing public health or system equity could entice sponsorship funds from interested foundations, institutions or corporations. Or, a system oriented to downtown Redmond's visitors or regional attractions such as Marymoor Park, local restaurants and brew pubs could bring in sponsorship dollars through key stakeholders in the leisure/tourism economy.

System-wide Planning – A bike share program's goals can also impact the network's overall service area, density of bikes/stations and placement of docking stations (or placement of hubs for self-locking, free-floating bikes). An emphasis on revenue generation would likely lead to a more-dense service area focused on the downtown areas with stations at key destinations for visitors. It is important to note that visitors purchasing non-member passes typically bring in far more revenue than local residents who are annual members. An emphasis on providing mobility for underserved communities and those dependent on bus transit would lead to a more-dispersed system plan covering a larger service area.

Determining Goals and Evaluation Criteria

The following list identifies the City of Redmond's bike share goals. These are based on universally identified bike share goals, which have been specifically tailored to Redmond based on the City's planning documents.

LETTER	GOAL OF BIKE SHARE SYSTEM
A	Improve last mile access to public transit network for areas of the city, especially in areas that are underserved by or lack transit service
B	Provide alternative to motor vehicle traffic and reduce pollution
C	Increase physical activity to benefit public health, and provide schools and institutions with access to mobility choices
D	Improve access within and to employment centers, campuses, parks, event locations, urban growth centers, and other destinations
E	Enhance Redmond's identity as a bikeable community, and make the city more bike friendly
F	Increase the number and safety of bicyclists on the street by creating a bike share system that is useful, convenient, reliable and safe
G	Define the level of revenue necessary to maintain ongoing operations when combined with other funding sources, and plan a system that can sustain this level of revenue
H	Position the system as a driver of community vitality and economic development, one that promotes and supports tourism in the city

Evaluation criteria have also been identified and prioritized to inform system plan and business model decisions.

In order to move forward with developing a system plan and business model, and ultimately implement bike share, the City must weigh and prioritize key trade-offs. These trade-offs particularly relate to the subjects of defining the system's service area, equipment type, approach to regional integration, and station placement. These trade-offs are described graphically on the following page.

BIKE SHARE SYSTEM TRADE-OFF's

When developing a bike share system, it is important to understand trade-offs between different variables that will come to define it. The list below illustrates some of these key trade-off's, each of which have pros and cons. Together, they need to be evaluated so that a balance can be struck that is most appropriate for the goals and context of the system being planned.

High level of coverage across the entire City

Dense network of stations in core areas

SERVICE AREA SIZE

Very durable equipment is more expensive

Low Cost equipment tends to be less durable

EQUIPMENT COST

Independent system offers autonomy & flexibility

Cost/operational benefits to joining regional system

REGIONAL SYSTEM

Replace parking spaces with bike share stations

Place stations off-street, impacting pedestrian traffic & open space

STATION PLACEMENT

The development of the City's evaluation criteria began by considering the following list of evaluation criteria, some of which, included direct trade-offs with one another:

#	EVALUATION CRITERIA (in non-prioritized order)
System Approach	
1	Maximize Coverage – equitably serve as much of the community as possible
2	Maximize Revenue – serve trips that will generate the most overall system revenue
3	Maximize Ridership- serve areas that will result in the highest overall use of the system (typically measured as daily trips per bike)
System Integration	
4	Integrate Redmond's program with regional bike share program
5	Integrate Redmond's program with other Eastside bike share programs (public & private)
Station Placement	
6	Avoid sidewalk stations to minimize impacts on pedestrian traffic and other sidewalk uses
7	Avoid on-street stations to minimize parking loss and potential conflicts with moving vehicles
8	Avoid stations on private property to minimize the need for detailed license agreements for property owners
9	Avoid stations on City property (i.e. parks/city campus) to minimize impacts to green space and/or existing and future uses
10	Other criteria to consider

Based on an evaluation of these criteria by the City, the City will be designing a system that:

- **Maximizes ridership** – Develop an efficient system with stations placed in high-demand areas, as opposed to a system that maximizes coverage and includes stations placed in low-demand areas in an effort to service a larger proportion of the city.
- **Integrates with regional system** – Develop an expanded Pronto system in Redmond, as opposed to developing an independent and uniquely branded system. The City's system will, first, integrate with the regional bike share program, and second, with the Eastside bike share program. Additionally, strive to integrate bike share with regional transit fare card system.
- **Optimizes station placement** – Stations should be located at logical locations from a functional and operational standpoint in order to maximize ridership and minimize operational costs. It is important that station placement recognize the trade-offs between various public and private sites. Locating stations should also consider:
    - Safety in terms of access, lighting, providing helmets, and potential for criminal activity
    - Sensitivity of station placement in vicinity of historic properties
    - Impacts to open space and green space

- **Is scalable** – Develop a system that can be implemented in phases, expand as demand grows, and modified as demand needs change. Changes could be in the form of adding new stations, moving existing stations or modifying the number of docks at an existing station.

6. Stakeholder & Public Engagement

The Goals and Evaluation Criteria survey results (see Appendix A for survey results) were a key part of the engagement strategy for the Bike Share Feasibility Study. Other engagement elements included:

- Stakeholder meetings
- Community outreach
- Community survey

Stakeholder meetings: The project team (City of Redmond Project Manager and Alta staff) held three meetings with stakeholders, including property management representatives from the Redmond Town Center, City of Redmond Parks and Recreation staff, and managers at Microsoft, including their transportation management vendor CBRE. Key takeaways from the three meetings include:

- Redmond Town Center
  - While most visitors arrive by car, they have noted more arrive by walking recently, presumably from downtown and the new neighborhood along the Central Connector.
  - The Marriot is well used by business travelers (Microsoft, etc) during weekdays but more so on weekends by event-goers such as for the 60 Acres soccer tournament or the weekly vintage car show; currently the Marriot has its own bike fleet.
  - Future development will include a new 170 room hotel and 250 units of housing.
  - Potential bike share locations include REI, the Marriot and the south edge of the Town Center, adjacent to the Bear Creek Trail.
- City of Redmond Parks and Recreation
  - At some parks there are space issues, so the team needs to be cognizant when planning stations near or in parks
  - Parks with the highest use include Grasslawn Park, Hartman Park and, when complete, Downtown Park; all will be good destination for bike share users
  - Currently, there is no advertising-prohibition policy that would impact bike share
- Microsoft
  - Microsoft will soon complete their Campus Bike Share feasibility Study (also by Alta)
  - They believe that a coordinated system between City of Redmond, Microsoft and Seattle makes sense

At the So Bazaar event on August 13, the project team solicited survey results and offered rides on Seattle's Pronto bike

Community outreach: in order to promote bike share to people who live, work in and visit Redmond, the project team hosted a booth at So Bazaar event downtown on August 13. The booth included educational boards related to explaining what bike share is and the benefits for Redmond. Two Pronto

Cycle Share bicycles were on-loan from Seattle and available for test rides. The test rides allowed those unfamiliar with the Pronto bikes in Seattle to try one of the unique bicycles for the first time, building interest and support in bike share. Finally, planning team staff administered a bike share survey that included seven questions.

Community Survey: Fifty-six (56) survey forms were completed by attendees of the So Bazaar event or passers-by. Participants were asked:

1. How many trips do you make to and around Downtown Redmond, Redmond Town Center and Marymoor Park on a typical day?
2. How many trips do you make to and around Overlake and the Microsoft Campus on a typical day?
3. How often do you ride a bicycle (including leisure and commuting purposes)?
4. If Redmond had a bike share program, how likely would you be to use it?
5. If bike share were available, what are the three top areas you would use it most often?
6. What barriers, if any, would restrict your regular use of bike share? Please select all that apply.
7. What TWO factors would motivate or encourage you to try bike share?

Some of the key takeaways for the project team include:

- Bicycling is popular in Redmond: at least 57% of respondents ride at least once a month, with 46% riding at least once a week.
- Exactly half of all respondents said that they would either "likely" or "very likely" to use bike share if it were available.
- Although it is predictable that a large percentage of potential users would choose downtown as one of the top three areas to use bike share, 50% also said that they would likely use it to travel to, from and around Marymoor Park.
- While the City of Redmond has no control over the primary barrier to using bike share—"cold and wet weather—nearly 40% of respondents replied that the lack of bicycle infrastructure in Redmond would be considered a barrier to using bike share. In a related but separate question, 56% of respondents would be motivated to try bike share if there were ongoing improvements to bike infrastructure in Redmond.
- Nearly 70% of survey respondents said that they would be motivated to use bike share if they had easy access near their residence or place of employment. This is consistent with national surveys that rank "convenience" as the most popular reason people chose to use bike share.

The full results of the survey can be found in the appendix of the report.

7. Local Context Analysis

Assessing the opportunities and challenges of implementing a potential bike share system in Redmond requires an analysis of the region's demographic characteristics, the built environment, and the types of destinations that typically propagate bike share usage.

The City of Redmond has some of the characteristics traditionally thought to support bike sharing, including:

- An amenable policy environment, with support for bicycling shown in the City's transportation master plan effort and ongoing implementation of new facilities and programs
- Relatively compact and walkable downtown and town center areas comprised of mixed use developments of ever-increasing density, with a population density of 3,325 people per square mile, city wide
- A population with demographic characteristics known to support bike share: those 25-34 years old and of income levels at or above the median income for the area where the system operates. In the City of Redmond, 81% earn more than $3,333/month and 50% have a Bachelor's degree or higher.[8]
- Medium employment density on the Microsoft Campus, with an average of 45,000 people on the campus per workday, including full time staff, vendors and visitors.
- The Microsoft Campus is well connected to Redmond Town Center via the 520 bike trail
- A well-integrated and growing trail system and bike facilities, especially downtown and in the surrounding districts
- Popular recreational destinations in Marymoor Park that draw visitors from throughout the city and region
- Popular eating/drinking/shopping areas in Redmond's Town Center and along Cleveland St and Redmond Way.
- A robust bus network, with express lines to downtown Bellevue and Seattle, and multiple light rail stations opening by 2023 in the Overlake District and potentially downtown by 2030

Based on bike share industry experience, the factors above are considered indicators of a successful bike share program. Others indicators of success—high levels of tourism, expensive parking and busy nightlife districts with clubs and restaurants—play a minimal role in Redmond. As described in Table 4, the City of Redmond features some significant opportunities for a successful bike share system:

Demographics

Bike share systems are most successful where there is a mix of land uses, medium or high density of homes and jobs, and where trip-making occurs throughout the day and night as well as on weekends. In the Redmond, a bike share program could provide an additional mobility option for:

- Local residents who live, work, learn and recreate in the bike share program service area *(e.g., a resident living downtown wanting to get to or from her job at Microsoft)*

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[8] Longitudinal Employer Household Dynamics

- Commuters traveling to the bike share service area via transit or other transportation. *(e.g., someone arriving at the future Overlake Transit Center and riding bike share to their job nearby).* In this way the system can:
  - o Offer a "last mile" option between home and transit or between the transit station and school, work, or other similar destinations
  - o Extend the reach of transit into areas that are currently underserved by transit

- Visitors accessing sports, entertainment, hotels, and cultural attractions *(e.g., a business traveler needing to get from their hotel to City Hall for a meeting)*

- Residents, employees or visitors looking to go for a relatively-short recreational ride along the Bear Creek Trail or the Sammamish River Trail *(e.g., a couple visiting from Seattle who shop in the Town Center and want to bike up and down the Sammamish River Trail for an hour before heading to a restaurant on Cleveland Street).*

The people who use and benefit from bike share systems are constantly changing. Many U.S. transportation officials were skeptical that bike sharing would be able to replicate the success of its European cousins, and initially, bike share systems in the U.S. were considered limited to only large cities with a high population and employment density and large mass transit systems.

As more success is realized, larger cities are expanding bike sharing into lower density and lower income areas, and mid-size cities, such as Boulder, CO; Topeka, KS; Des Moines, IA; and Chattanooga, TN. In addition, more inner city systems have expanded into neighboring cities or in some cases, adjacent suburbs creating semi-regional transportation systems. In Metro Washington DC, there are dozens of Capital Bikeshare stations in Arlington County and Alexandria, Virginia and four cities in Montgomery County, Maryland.

Population

The 2014 estimated population for the City of Redmond was 55,505.[9] For comparison, Topeka, Kansas, population of 127,679, launched Topeka Metro Bikes with 100 bikes in 2015. As shown in the table below, Redmond's population is low in comparison to the provided case studies, but its city-wide population density, at 3,277 persons per square mile, is comparable with other peer systems in Topeka and Boulder, Colorado. Since population density is a critical factor for the success of a bike share system, Redmond's moderately high density bodes well for the potential of bike share in the city.

Table 2: Population and density of Bike Share System Case Studies

City	Bike Share System	2013 Population	Population Density (persons/mi^2)
Seattle, WA	Pronto Cycle Share	652,405	7,969
Arlington County, VA	Capital Bikeshare	229,302	8,309
Cambridge, MA	Hubway	186,093	17,953

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[9] 2009-2013 American Community Survey 5-Year Estimate

Topeka, KS	Topeka Metro Bikes	127,679	2,118
Boulder, CO	Boulder B-Cycle	103,166	3,800
Redmond, WA	**--**	**55,505**	**3,277**

Source: U.S. Census Bureau, 2010-2012 American Community Survey

Early Adopters

Over the six years that bike share has been operational in North America, the demographic composition of the primary bike share user group has become apparent. In established systems, particular age groups and income brackets are disproportionately more likely to use the bike share system than low-income populations, especially in the initial launch year. The users of bike share in North America, generally, tend to be 25-34 years old, white, and of income levels at or above the median income for the area where the system operates. Systems tend to be launched in areas fitting this demographic. Although this strategy is intended to maximize ridership, an unintended effect may be that fewer users from other demographic groups will use the system as much as they might have if stations were placed in their neighborhoods initially.

In established systems, higher income households have adopted bike share quickly. Aproximately 46% of Capital Bike Share users in Washington DC and 39% of Minneapolis Nice Ride users reported household incomes over $100,000.

Many "early adopters" to bike share are between the ages of 25 and 34.

Populations aged 25 – 34 years old represent the largest group of bike share users (39% - 49% of bike share users compared to only 18%-22% of the general population). The City of Redmond's percentage of residents aged 25-34 years old is 21.9%, providing a significant pool of potential early adopters.

Understanding where people in this age demographic live and work within Redmond can help target the initial deployment area for a potential bike share system. Also, because bike share is so integrally linked with public transit in many cities, daily transit users can be a targeted audience as well. With targeted marketing campaigns, the owners and operators of the potential bike share system can help to encourage higher rates of early adoption.

Employment

Redmond is home to approximately 91,279 jobs, over 54% of which are classified within the Information sector.[10] According to analysis conducted by the Seattle Times, Redmond has a daytime population of about 110,000, an approximately 100% increase over its resident population of about 55,000 people. A very large percentage of the daytime population in Redmond is commuters.[11]

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[10] Longitudinal Employer Household Dynamics
[11] Balk, Gene. Census: Redmond has largest daytime population surge in U.S. The Seattle Times. June 3, 2013. http://blogs.seattletimes.com/fyi-guy/2013/06/03/census-redmond-has-largest-daytime-population-surge-in-u-s/

Major employers will serve as important trip generators and attractors for the bike share program, and will also be important corporate partners that could potentially bring sponsorship, corporate membership, or integrate bike sharing into their employee wellness and/or travel demand management programs. Bike share, in combination with ongoing improvements to public transit service, could considerably increase access to jobs. Some of the major employers in the study area are identified in Table 3.

Table 3: Top 10 Employers in Redmond[12]

Employer	Employees
Microsoft Corporation (Multiple Campuses)	33,792[13]
Terex (Washington and USA – formerly Genie Industries) - 18465 NE 68th St	2,078
Eurest Dining Services @ Microsoft - Dispersed throughout Microsoft's multiple campuses	980
Nintendo of America - 4600 150th Ave NE	942
AT&T Mobility - 16331 NE 72nd Way	915
Lake Washington School District - 16250 NE 74th Street	877
Physio-Control Inc. - 11811 Willows Rd	728
United Parcel Service - 18001 NE Union Hill Rd	690
Honeywell - 15001 NE 36th St	686
Aerojet - 11411 139th Pl NE	517

Visitors

There are many visitors that come to Redmond for work and leisure. The City has a resident population of 55,000 people, and due to an influx of workers and tourists during the day, the daytime population doubles to nearly 110,000 people.[14] A large percentage of visitors stay in the City while working on assignment at one of the City's large employers, such as Microsoft. Visitors also come to the City to experience the outdoor activities at Marymoor Park, recreation trails (city and regional) cultural events and shopping and dining in Redmond Town Center and downtown.Currently, most visitors rely on a personal motor vehicle to travel within Redmond and across the region to access these destinations. Bike share located near heavily visited areas such as Redmond Town Center, Marymoor Park, King

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[12] http://www.redmond.gov/business/AboutRedmondBusiness/LargestEmployers
[13] Number includes Microsoft Full Time Employees Only
[14] Balk, Gene. Census: Redmond has largest daytime population surge in U.S. The Seattle Times. June 3, 2013. http://blogs.seattletimes.com/fyi-guy/2013/06/03/census-redmond-has-largest-daytime-population-surge-in-u-s/

County Public Library, the Central Connector, DigiPen and Microsoft could link to other transportation options (such as local or regional transit) and allow visitors to avoid using a vehicle to travel throughout the city.
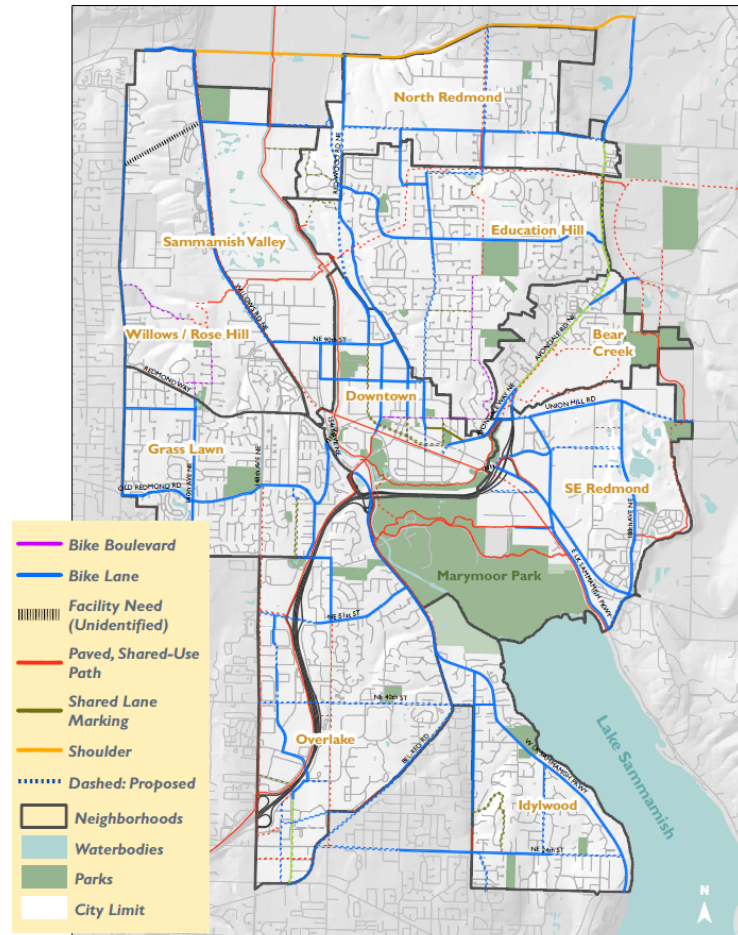

Figure 9: City of Redmond Bicycle System Plan

Policy Environment

Policies in the region that support bicycling as a mode of transportation have improved significantly in the last few years in the City of Redmond. In 2010, the City adopted Ordinance No. 2359, a complete streets ordinance to ensure "all transportation projects include safe and appropriate facilities for pedestrians, bicyclists, transit users, and persons of all abilities". At the heart of Redmond's Transportation Master Plan (2013) is a focus on improving multi-modal transportation. An entire section of the plan was dedicated to bicycle improvements, including the development of a bicycle network map that guides infrastructure improvements in the city. (Currently, a more-detailed bicycle strategic plan is underway with projected completion date in in late 2016.) The network shown in Figure 9 is comprised of existing and proposed trails that will serve as the spine of the bike network, supported by a dense system of on-street facilities. One key recommendation from the 2013 master plan was the implementation of a bike share system, coordinated with Puget Sound Bike Share. This system, called Pronto, is now in operation in Seattle. In addition to this plan, the City has produced its own Bicycle Facilities Design Manual. Finally, both the City and GO Redmond web sites provide helpful

bicycling information, including maps, notices for special bicycling events, and clubs and groups in the region.

In King County, helmets are mandatory for both child and adult bicyclists. This is important, as cities and regions with mandatory helmet laws for adults have had more difficulty launching and/or sustaining a bike share system. The Pronto system has overcome this issue by providing free helmets to members and low cost helmets for rent in bins located at every bike share station. Also, state law specifies the rights of bicyclists to the road, including riding with traffic whether a bicycle lane or other facility is present or not. Bicyclists may ride no more than two abreast in the roadway, and the laws do not prohibit bicycling on sidewalks, except in central business districts (unless otherwise permitted by local traffic ordinances).

Physical Characteristics

The City of Redmond is characterized by suburban development patterns, but recent City-led efforts have focused on improving the built environment and transportation infrastructure to make Redmond a more bike and walk friendly community. Currently, the majority of residential, commercial, and industrial land uses are separated, making non-motorized circulation between these activity centers more difficult than in communities that are comprised of primarily mixed-use districts. The dominant presence within the landscape is the Microsoft Campus in Overlake, where nearly 45,000 people work on an average day. This and other employers attract nearly twice the City's resident population on a daily basis, making traffic in and out of the Redmond during peak periods heavy. To accommodate this traffic, many large arterial streets intersect Redmond, such as SR 520, SR 202, 147th Ave NE, and other major roads. Connecting to these streets are cul-de-sac neighborhoods comprised of low-density, single family housing units. Many of these neighborhoods can only be accessed by traveling on arterial and collector streets. Redmond's Downtown and Overlake Districts do boast a mix of uses and a streetscape that helps to calm traffic, and has pedestrian amenities including street trees and wide sidewalks, but these areas occupy a relatively small portion of Redmond.

Transit

Public transportation plays a key role in the success of a bike share program. In many other cities, bike share stations are planned to sit adjacent to major transit hubs and rail stations. Bike share can provide an opportunity to close gaps within a transit system and to provide the "last mile" connection between people's homes and places of work or school and vice versa. It is important to note that most cities that take advantage of this synergy feature a rail-based transit system, supplemented by buses (e.g., Washington DC, Boston, Chicago, and Charlotte). In smaller cities that do not have rail transit, there are limited opportunities to co-locate bike share stations with transit. Because rail transit stations are less frequent and spaced farther apart, they host far greater number of boarding and alighting passengers than individual bus stops. Rail transit stations are also more likely to be surrounded by dense, mixed use development. Other than key hubs and transfer points with multiple bus lines, it is difficult to find a bus stop that is busy-enough and/or in an active-enough area to utilize the multi-modal synergies between bike share and transit.

In the Redmond, the two main transit services are King County Metro Transit and Sound Transit, which together operate bus routes in the city that service neighborhoods, adjacent cities and other areas in the region. Microsoft also provides various shuttle opportunities for the thousands of staff who commute by transit. Of important note is the planned expansion of two East Link light rail stations at the Overlake

Village an Overlake Transit Center that will start construction in 2016, with trains running to Bellevue and Seattle beginning in 2023. In preparation for the new light rail service, the Overlake area continues to become more dense, mixed-use, and walkable. This is the context that supports bike share use and would be attractive to site future bike share stations. In addition to the Overlake Transit Center, the Redmond Transit Center downtown effectively acts as another rail stations in Redmond, and providing bike share at there would enhance the overall mobility for transit riders.

Bike Network

Redmond has a robust multi-use trail system and a growing on-street bikeway network. This includes the East Lake Sammamish Trail, the Sammamish River Trail, the Bear Creek Trail, Redmond Central Connector, the 520 Trail, and various streets with striped bike lanes throughout downtown and along a handful of collector and arterial roadways. Though incomplete, Redmond's current network is a strong foundation for a bike-friendly city that can support a bike share program.

The 520 Trail forms the primary bicycle spine between downtown Redmond and Overlake

There is limited empirical information to suggest whether a dense network of bicycle infrastructure is absolutely required for bike sharing to be successful. However, bicycle infrastructure makes bicycling more comfortable for the great majority of riders, and reason would suggest that supporting infrastructure is a key component to making bike share successful. For North American systems, bike share systems have acted as a catalyst for increased investment in bicycle infrastructure. This has happened in Washington DC, Salt Lake City and Chicago especially, as the aggressive investments in new bike lanes, cycle tracks and shared roadway treatments has occurred since the launch of bike share in 2010 and 2013, respectively. Bike share in all three of these cities has subsequently flourished. In other cities, such as Madison, WI, and Minneapolis, a well-established bicycle network had already been developed before bike share was launched.

Climate

A particular city's climate can influence demand for a bike share program. Figures 10 and 11 below show average monthly temperature and rain fall in Redmond. In general, the region experiences mild to warm temperatures during summer months, cool temperatures during the winter, and generally mild temperatures in the spring and fall. Precipitation is moderate to high throughout the year with a range between <1" to >5" per month. Like most Pacific Northwest cities, winter can be drizzly, with days and weeks of on-and-off rainfall. Despite the less-than-ideal winter weather, Seattle's Pronto bike share program is not put in storage for the winter, and runs 12 months of the year. For reference, Figure 10 below indicates the annual average monthly temperature and precipitation levels.

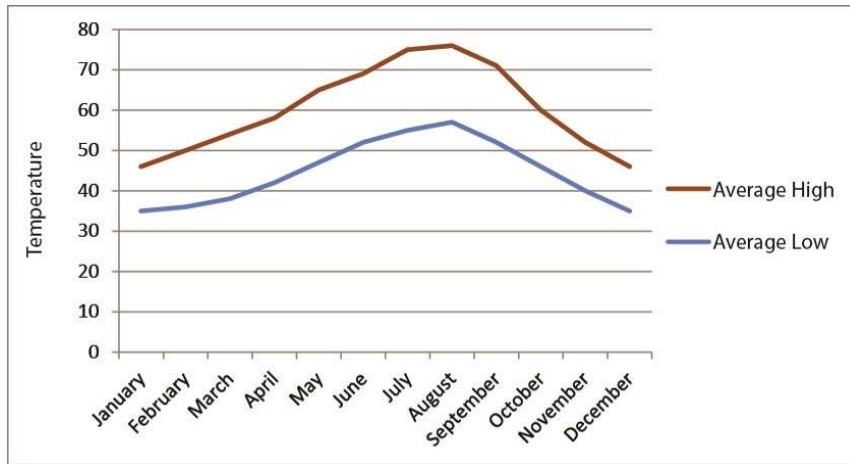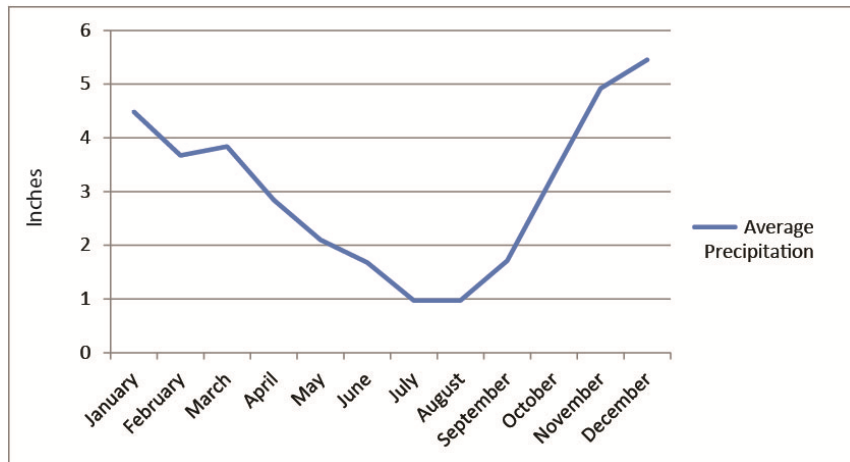Figure 10: *Annual Average Monthly Temperatures and Precipiation in Redmond*[15]

Figure 11: *Annual Average Monthly Precipitation in Redmond*[16]

Challenges and Mitigation Strategies

Though there are many factors that exist in Redmond that are favorable to bike share, there are also a number of challenges to developing a successful bike share program throughout a large portion of the City. These include:

- Many sections of Redmond are characterized by suburban development patterns, consisting of single family homes in cul-de-sac neighborhoods. Such street configurations make bicycle connections between these neighborhoods more difficult, since they are typically linked by busy, arterial streets that are not comfortable for bicycling.

- The land use and zoning policies that Redmond has pursued historically have resulted in a significant separation of land-uses. Bike share works well in mixed-use areas which create

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[15] Observed Temperatures and Rainfall Redmond, WA. www.weather.com
[16] Observed Temperatures and Rainfall Redmond, WA. www.weather.com

multiple and proximate origins and destinations that creates higher demand for more spontaneous trips.

- With a 1.2% bicycle commute mode share within the City of Redmond, there are relatively low levels of bicycle use for transportation purposes.

- High speed and volume arterial roadways with minimal safe connections creating gaps between activity generators.

- The topographical change between downtown Redmond and the Overlake District will likely reduce demand for biking from the former to the latter.

A significant proportion of bike commuting in Redmond occurs in the Overlake District to and from the Microsoft campus

- Low barriers to personal bicycle ownership and use: Most people live in detached homes or small apartment complexes where there is ample storage space for a bicycle and minimal theft concerns. That reduces the pool of people looking for a way to get around Redmond who might not otherwise use their own bicycle.

- Low barriers to automobile ownership and use: Though Redmond's mode share is evolving, automobile travel is the dominant form of transportation and ample parking is inexpensive or free throughout the city.

The last point, in particular, is expressed in the relative ease of auto travel and parking throughout the region. Most successful bike share systems include large portions of their service area in districts and neighborhoods where travel by car or transit can be slow, parking is difficult and expensive, and residents are regularly taking some of their trips by non-auto modes of transportation. The fact that driving is a convenient mode of transportation could serve to work against the viability of a bike share system, and policies should be implemented to incentivize alternative modes of transportation to support bike share.

Though there are challenges, there are opportunities to mitigate their impact and create an environment in Redmond where bike share can flourish. These mitigation strategies are identified in Table 5.

Table 5: The challenges to bike share in Redmond and mitigation strategies

Challenges	Strategies
• Bike infrastructure is growing but is not yet a comprehensive network across the city	• Ensure continued funding and implementation of the Bicycle System Plan recommendations included in the Transportation Master Plan
• SR 520 and other arterials through Redmond create a physical and psychological barrier to bicycle connectivity to adjacent districts	• Expedite bike facility and wayfinding improvements on key roadway connections to link residential areas and the Microsoft Campus to downtown
• A relatively low residential population density	• Continued efforts to promote mixed-use development downtown and at Overlake, as well as in other neighborhoods where appropriate.
• Ease of automobile access and parking can be an incentive for many to drive rather than seek alternative modes	• Use redevelopment policies and public outreach to encourage transit, biking and walking trips among commuters and residents; work with employers and developers to provide viable transportation alternatives, including bike share
• The hill between downtown and the Overlake area and Microsoft campus	• The City and future bike share operator should consider credits and discounts for using bike share in the uphill direction and consider electric assist bikes as part of an eventual RFP for equipment.

Existing Conditions Assessment Conclusion

The City of Redmond has a number of characteristics supportive of a successful bike share system.

Key strengths of the City include:

- Support from agency officials and recent bicycle-oriented planning documents that have established momentum for bicycle infrastructure and initiatives
- Large pool of employment at the Microsoft campus and elsewhere
- An increasingly active downtown with the types of land uses—hotels, restaurants and shopping areas—that support bike share
- Relatively flat topography in the downtown area, with interconnected trails
- Warm summers, low in humidity
- A successful bike share system in neighboring Seattle has increased awareness and interest in bike share on the Eastside

There are, however, challenges that need to be both understood and addressed to make a bike share program more successful. These include:

- The free/inexpensive parking throughout the City that can temper demand for bike share
- Limited areas of jobs concentration outside of downtown Redmond and the Microsoft campus
- Busy collector and arterial roads in the city
- The large hill between downtown Redmond and the Overlake area.

A key for success of bike share in Redmond is leveraging the city's trail system and on-going mixed use development downtown and in Overlake Village

While many of the challenges listed above are long-term policy and economic issues, Redmond can mitigate some by concentrating on the ongoing development of a bicycle network and redevelopment downtown and near anticipated light rail stations. These strategies will not only create a more-beneficial environment for bike share itself but will increase likelihood of drawing the demographic profile that helps to support bike share.

8.   System Planning

This section of the report defines the size and service area of a potential year-round bike share program in Redmond, Washington and summarizes the proposed phasing plan. From this point forward, the term bike share "station" could mean either a heavy, steel-plate based station with electro-magnetic docking units ("dock based"), or a cluster of analog bicycle racks designed for "smart-lock" bikes. In both cases, a kiosk and display panel (for maps, program information and, potentially, advertisements) would accompany the majority of stations and eight to ten bicycles, on average, would be available within 16 to 20 docking points or racks.

Dock-based station: uses steel plates and electromagnetic docking points (Seattle Pronto)

Smart-lock station: uses a cluster of analog bike racks (Hamilton, ON bike share)

Basis for Service Area Recommendation

Defining the coverage, or "service area", of the system considers input from the City of Redmond and key stakeholders and is based on the qualitative bike share program goals and Alta's quantitative bike share demand analysis. One of the primary stakeholders is the Microsoft Corporation, who initiated their own campus bike share study early in 2015 (completed by Alta). Alta's recommended plan for Microsoft includes 12-20 stations (many designed as mini-stations) with a service area that encompasses their entire campus in the Overlake District. All of these factors are ultimately taken into account in order to determine a recommended service area, station density and phasing throughout the city of Redmond.

Goals for the Recommended Service Area (Qualitative)

Described earlier in the report, there are a series of goals established for the bike share program in Redmond. They are used as guideposts for many of the decisions related to planning and implementing the program. The key goals used to help inform the service area recommendations include:

- Improve 'last mile' access to and from public transit

- Improve access to employment, parks, destination and areas of growth in Redmond

- Provide a high visibility system to improve Redmond's identity as a bike-friendly city

- Promote and support community vitality, economic development and tourism

The goals most relevant to System Planning include a number of trade-offs that were carefully balanced for Redmond's recommended service area and station sites. For instance, while the service area will fill in the interstitial areas between transit stops in Downtown Redmond and the Overlake area, it generally cannot provide coverage along all of the city's bus lines. Likewise, due to funding challenges and lower density development, coverage will not reach all of the city's employment areas, parks and retail/commercial destinations.

Bike Share Demand Analysis (Quantitative)

Areas with the highest potential demand for bike sharing are taken into consideration for deployment of bike share. These locations will generate the most users and likely attract the highest value sponsorships. As a result, they are the most likely to be financially sustainable. High demand areas were identified through a GIS-based "heat mapping" analysis that allocated points based on where people live, work, go to school, take transit, shop, eat and drink. The GIS data included development projects currently under construction and those permitted for completion by 2018.

To maximize the financial feasibility of the initial bike sharing system, the System Plan proposes that the majority of stations in Phase 1 be launched in the highest demand areas downtown and near other major activity generators, such as the Microsoft Campus (see Figure 12 on following page). This will enhance financial sustainability of the system by allowing potential revenues to be directed into the system while also increasing the likelihood of a significant sponsorship agreement with Microsoft. Beyond the initial launch area however, subsequent phases are likely to:

- Infill the initial launch area with a greater density of stations

- Expand into areas contiguous with the first phase that have moderate levels of expected demand

- Expand into new areas that are desirable from a social or geographic equity perspective

Destinations such as City Hall, represent potential generators of bike share trips

Demand for bike share can also be understood by looking at the generators of bicycling activity within Redmond. These include cultural destinations, the public library, shopping areas (especially adjacent to cafes and restaurants), recreation-based destinations and other destinations directly accessible from Redmond's extensive greenway trail system. A map showing these destinations in Redmond is shown in Figure 13.

Figure 12: *Demand Map showing areas with highest levels of relative demand for bike share*
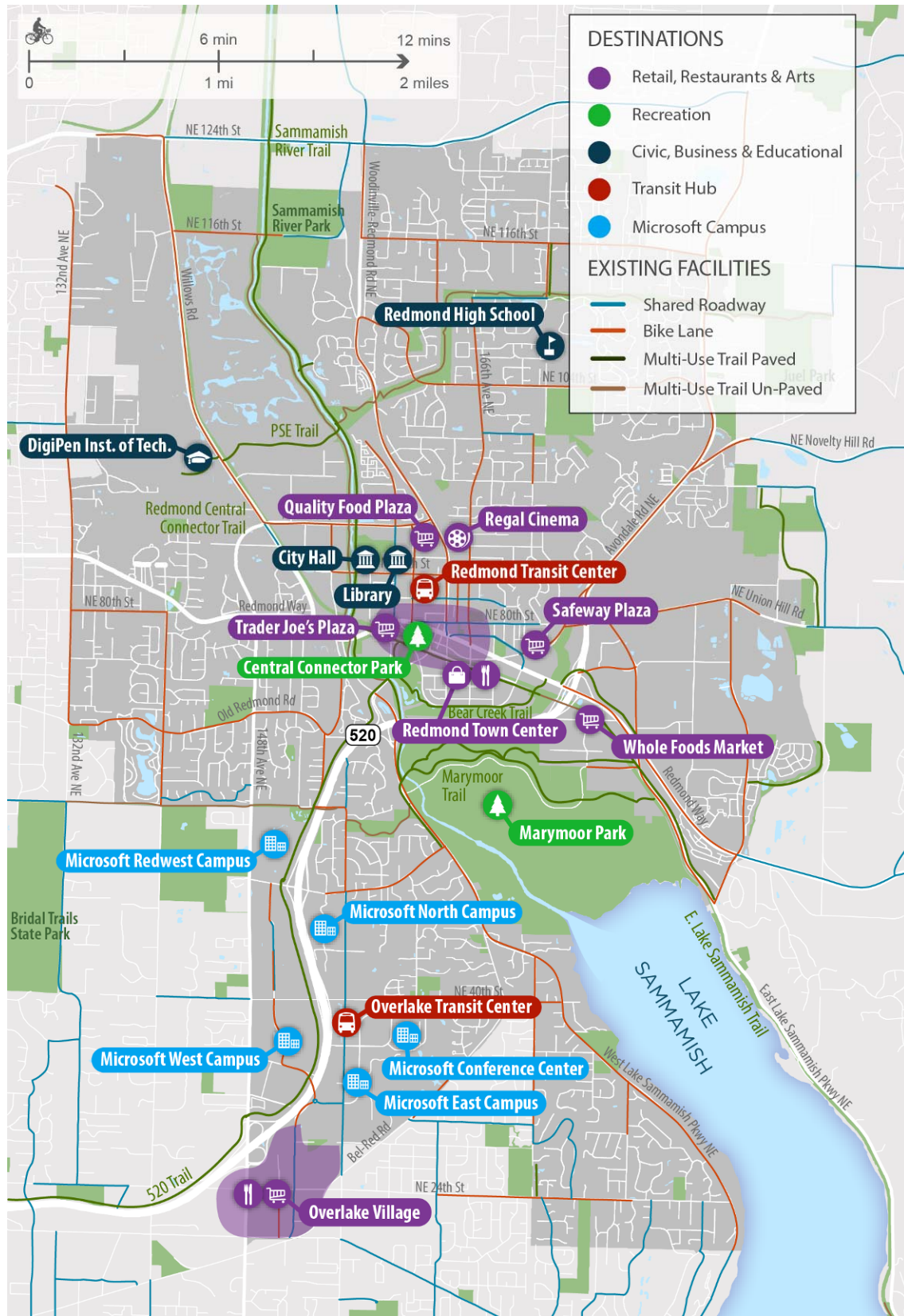
Figure 13: *Key destinations that generate demand for bike share in Redmond*

Station Spacing and Footprint

Within the central portion of a recommended service area, **bike share systems work best when stations are spaced roughly ¼ mile (1320 feet) apart**. Replicated over a larger area, this represents a station density of at least 16 stations per square mile. This range provides access to a bike within a short walk of anywhere in the service area and provides a nearby alternative to return a bike if the destination station is full. Along the edges of the service area, demand typically is lower and it is more likely and acceptable for stations to be spaced further apart, sometimes as far as ½ mile. It is important to minimize the number of stations that are further than a ½ mile apart. Beyond that, bike share stations become isolated, which impacts their utility and makes them more difficult to maintain an appropriate number of available bikes and open docks. Regardless of the ultimate station density within Redmond's service area, what is more important than maintaining the ideal density outlined above is to place stations within close proximity to the destinations and districts in which people are expected to want to use bike share to access.

Within Redmond, the recommended bike share service area is 1.3 square miles for Phase 1A and 1.7 square miles for Phase 1B (see Figure 16). Although some stations may be within ¼ mile of each other, the estimated number and recommended location of stations diverges a bit from the ¼ mile goal due to:

- The varying nature of demand for bike share within Downtown Redmond, the Microsoft campuses and the Overlake Village area

- Physical barriers to bicycle travel such as Route 520, disruptions in the land use pattern and steep topography

- Geographic location of destinations in which bike share stations are desired

- Funding realities that preclude the ideal station density within the core of the service area

In the case of bike share equipment that provides an option to lock-up anywhere within the overall service area—so-called "smart lock" systems—efforts will need to be taken to encourage users to return bikes to designated stations. This can be done through a pricing mechanism that includes a modest fee for any bike parked and locked outside of a station or beyond the designated service area. Whether a more robust, station-based system or a smart-lock system is ultimately deployed in Redmond, what is critical is that a geographically-defined service area with an appropriate station density of roughly ¼ mile spacing (½ mile maximum) be established.

Station Footprint

Bike sharing equipment has been designed to fit the urban environment. Although docking points can be fixed and hardwired into the pavement, contemporary station technology—either dock-based or "smart lock" based—has the advantage of being modular, and uses solar power, wireless communications and GPS technologies that do not require excavation or hardwiring. As such, stations can be moved, relocated, or expanded easily to meet demand, or to accommodate temporary events.

Station locations should be:
- Highly visible and accessible

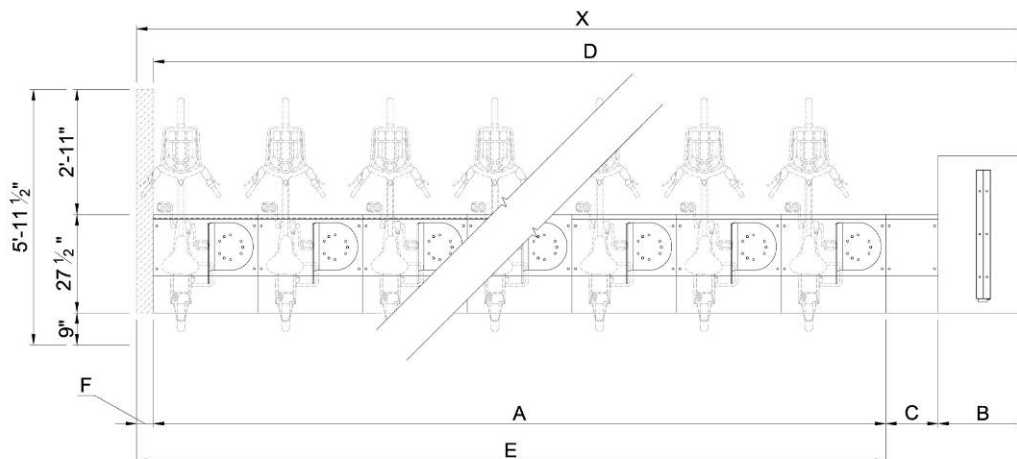- Consider other modes of travel (e.g., they should not impede pedestrian circulation or be placed in bus zones or block building entrances)
- Accessible by motor vehicle, which allows small crane trucks and vans to deploy the station, and to provide rebalancing and maintenance of bicycles during peak periods.

The physical space occupied by a bike share station will vary depending on the equipment selected and the number of racks or docking points at each station. Modules generally come in 2.5-foot, 5-foot or 10-foot lengths that accommodate one to four parking spots. In nearly all cases, a minimum of six feet of station depth will be needed to accommodate the length of a parked bicycle within the station. In some cases, orienting racks or docks at a 45-degree angle can save 12"-18" of station depth. Additional space is also required behind the bike to allow users to pull the bike out from the station and reorient it in the
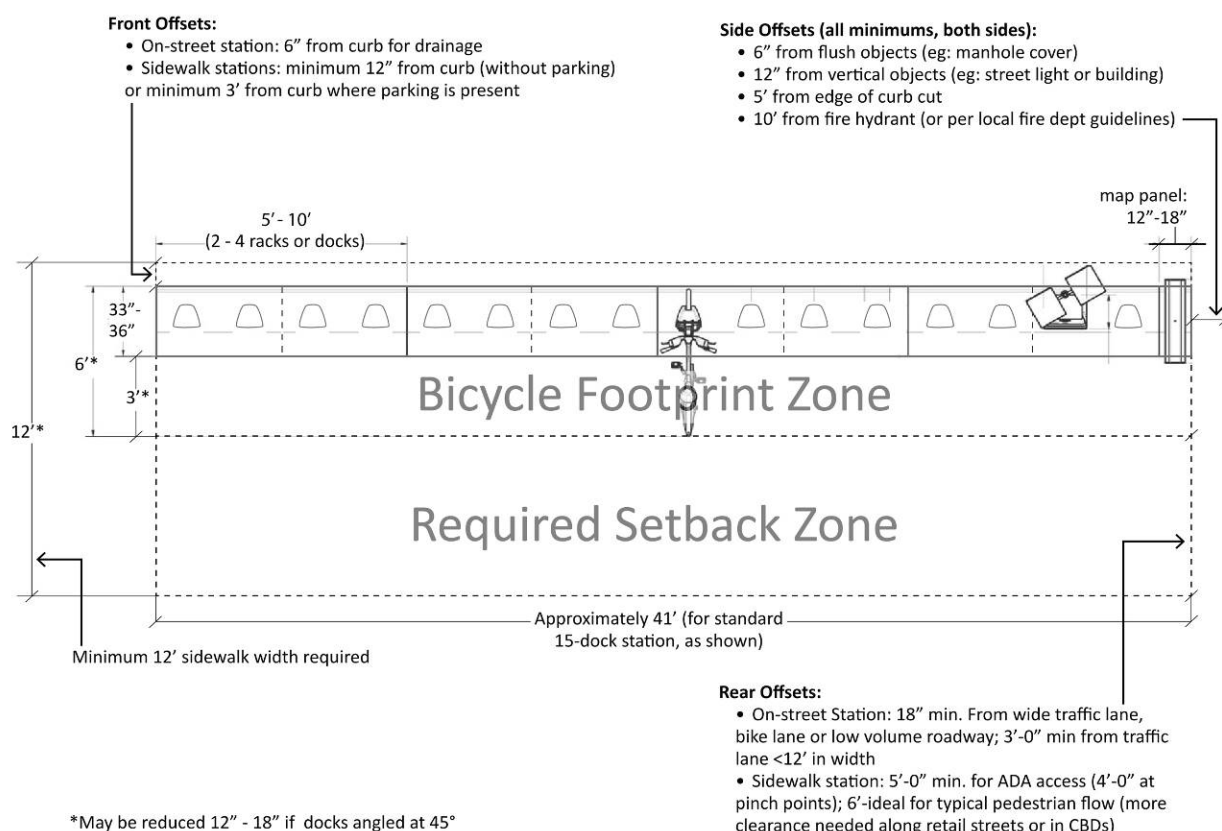
Figure 14: *Graphic diagram showing the spacing and offset needs for a generic, 15-dock bike share station (dock-based system) to be located either on-street or off-street.*

desired direction of travel. The example diagram is for a typical, dock-based station of 15 docks with a payment kiosk and map panel approximately 41 feet in length by six feet in width. The diagram also illustrates key front, side and rear offset dimensions from the station to utilities, traffic lanes, curbs, or other vertical objects. For stations placed on-street, this equates to two or three curb-side auto parking spaces. The graphic below illustrates the dimensional needs of a smart lock station utilizing Social Bicycles equipment that includes 12 to 18 racks. (Offsets would be similar to the dock-based footprint above.) Stations with fewer than 12 racks should be avoided if possible, as they are more likely to suffer from being either full—no racks available—or empty—no bicycles available.

	General **Dimensions**					W/ Sign on **Right**		W/ Sign on **Left** (not shown)	
	A	B	C	D	E	F	X	F	X
# of Racks	Base Plate(ft/in)	Sign(ft/in)	Spacer (ft/in)	Base Plate + Sign (ft/in)	Base Plate + Bike Overhang (No Sign) (ft/in)	Bike Overhang (ft/in)	Total Length (ft/in) *	Bike Overhang (ft/in)	Total Length (ft/in) *
12	29' 6"	2' 1"	1' 2 3/4"	32' 9 3/4"	30' 2"	0' 8"	33' 5 3/4"	0' 0"	32' 9 3/4"
13	31' 11 1/2"	2' 1"	1' 2 3/4"	35' 3 1/4"	32' 7 1/2"	0' 8"	35' 11 1/4"	0' 0"	35' 3 1/4"
14	34' 5"	2' 1"	1' 2 3/4"	37' 8 3/4"	35' 1"	0' 8"	38' 4 3/4"	0' 0"	37' 8 3/4"
15	36' 10 1/2"	2' 1"	1' 2 3/4"	40' 2 1/4"	37' 6 1/2"	0' 8"	40' 10 1/4"	0' 0"	40' 2 1/4"
16	39' 4"	2' 1"	1' 2 3/4"	42' 7 3/4"	40' 0"	0' 8"	43' 3 3/4"	0' 0"	42' 7 3/4"
17	41' 9 1/2"	2' 1"	1' 2 3/4"	45' 1 1/4"	42' 5 1/2"	0' 8"	45' 9 1/4"	0' 0"	45' 1 1/4"
18	44' 3"	2' 1"	1' 2 3/4"	47' 6 3/4"	44' 11"	0' 8"	48' 2 3/4"	0' 0"	47' 6 3/4"

Figure 15: *Graphic diagram showing the sizing requirement for a smart lock bike share station of varying sizes (image used with permission from Social Bicycles)*

Recommended System and Phasing Plan

The proposed System and Phasing Plan was developed by incorporating the findings from the Bike Share Demand Analysis map, input from the City, key stakeholders, and the Study's public outreach component. It also assumes that Microsoft will ultimately choose a compatible system. The Plan is also based on the typical characteristics for a logical roll-out program: 1) manageable stages that match funding and organizational capacity, 2) well promoted in order to create media attention and 3) large enough to provide coverage to key destinations and active areas. In Redmond, the minimum number of stations required to create "critical mass" for the program and to provide service to the City's key destinations is at least ten stations. These ten would cover the core of downtown with stations in Marymoor Park, Overlake and elsewhere coming subsequently. Fewer than ten risks creating a system that does not cover a large enough area in the city's core to be useful as a transportation or recreational utility for residents, visitors and employees.

It is recommended, therefore, that the first phase of bike share include the core of Downtown Redmond, along with Microsoft's various campuses in the Overlake area and within Overlake Village (see Figure 16). It is important to note however, that the Microsoft Corporation has developed their own bike share

plan and will likely provide most or all of the funding for both capital costs and operations. As such, Microsoft may be on a somewhat different timeline than the rest of the city, potentially launching a bike share program that serves their cluster of campuses up to a year earlier. In response, this Feasibility Study breaks the recommended first phase into two parts. Depending on Microsoft's ability to move quickly, along with the City of Redmond's ability to tap into state funding available for Eastside bike share and/or secure a sponsor for operations, Phase 1A and 1B may be launched together or separately.

The proposed roll-out strategy is shown on the following page and includes:

- **Phase 1A** (14 stations with 126 bikes and 252 docks): one half of the recommended initial launch area covers virtually all of downtown with a station planned for Marymoor Park. Stations will be located at important destinations such as the Redmond Regional Library, the Transit Center, Redmond Town Center, and the Regional Connector.
- **Phase 1B** (14 stations with 126 bikes and 252 docks): the other half of the initial launch area includes Microsoft campuses in Redmond, the Overlake Transit Center and two stations in Overlake Village. While final placement will be determined by Microsoft, stations will likely be placed at prominent office buildings, those with large cafeterias or destinations such as the Commons.
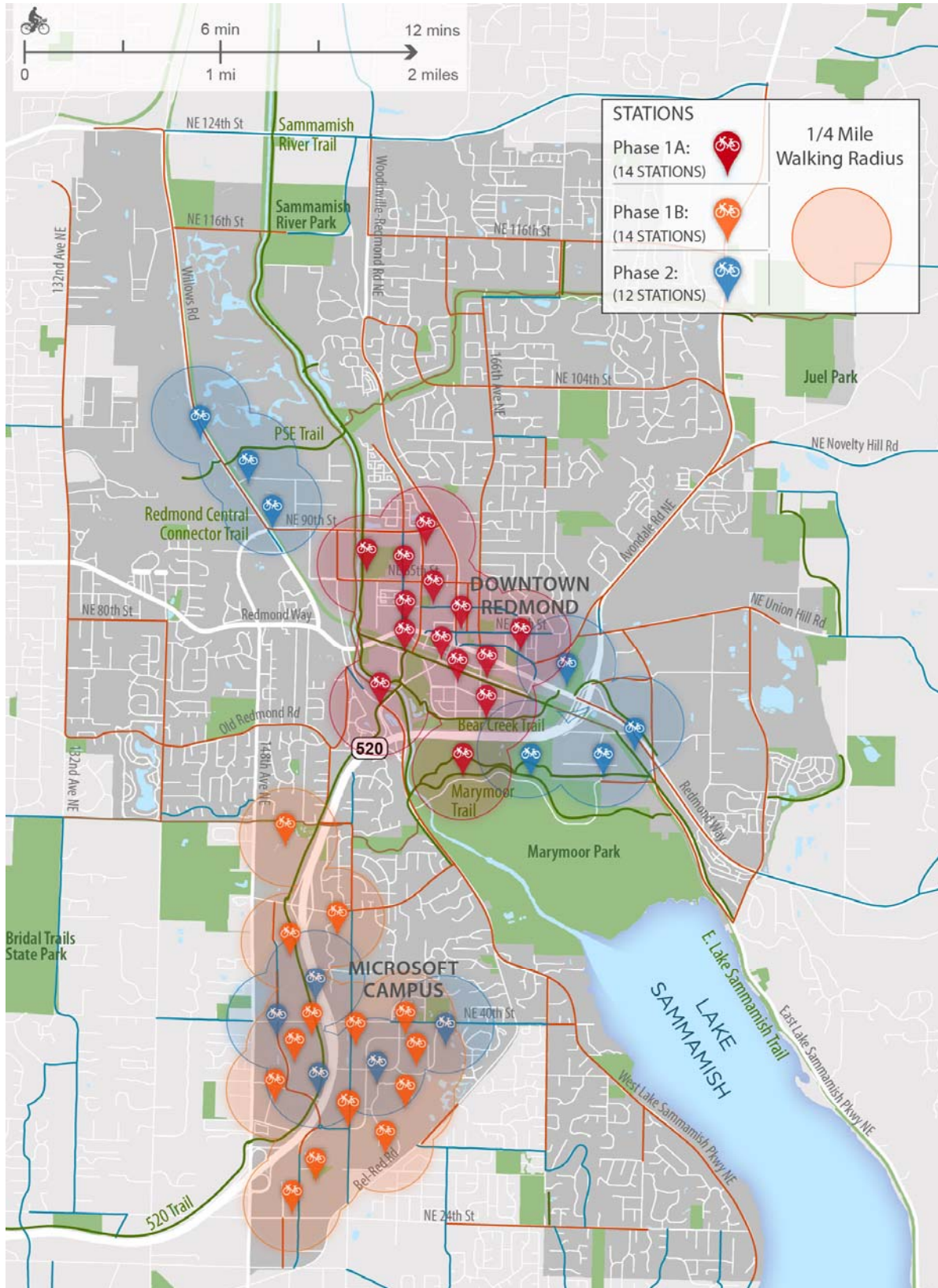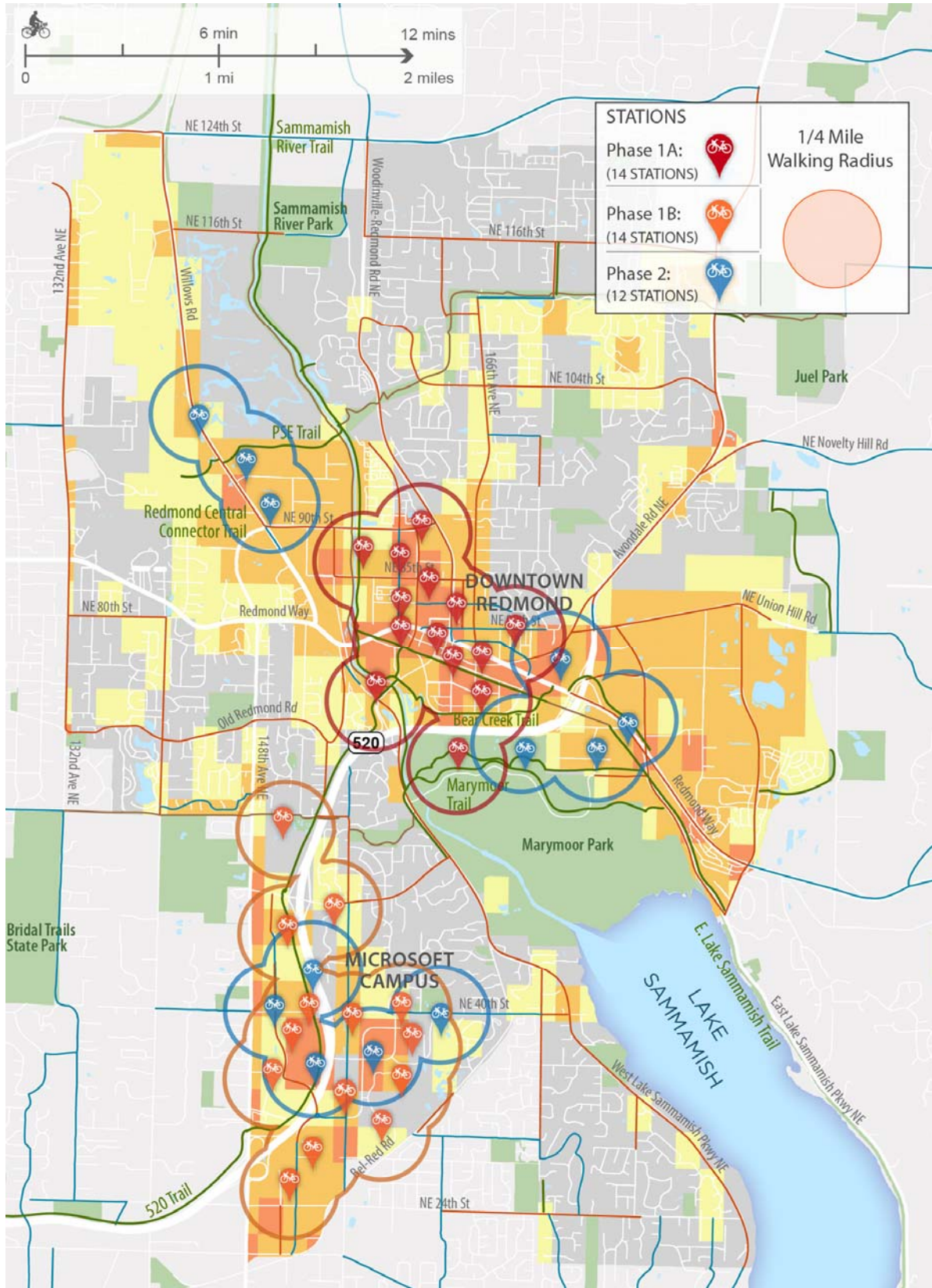
Figure 16: *Bike share station location and phasing map*

Figure 17: *Bike share station location and phasing map superimposed onto the Demand Map*

The decision to expand beyond Phase 1A and 1B will depend on available funding and the success of the system. Essentially, the system will grow if the expansion can be sustained through existing funding or an additional influx of user fees, private sponsorship, grants or public funding. Success is typically measured in terms of visible achievements such as:

- High ridership,

- Number of members and casual users (i.e. those with day or weekly passes),

- Positive public response,

- Safety record (few crashes/casualties),

- Neighborhood and corporate requests for station expansion, and

- Ongoing financial performance.

Understanding and tracking these achievements will be an important role for the system owner and/or operator. Some important metrics that should be tracked by the system operators to assess its performance include:

- Number of trips (monthly and annually) and how the number translates into daily trips per bicycle (based on experience in other small/mid-sized cities, roughly one trip/bike/day would be a desirable goal)

- Number of crashes and causalities (monthly and annually)

- Ratio of casual ridership to member ridership (monthly and annually)

- Fair-box recovery rate (monthly and annually)

Lastly, areas or destinations outside of the initial phases are not excluded from joining the bike share system or from accelerating their inclusion into an earlier phase. The reality is that locations interested in bike sharing can enter the system whenever they or the system operator have sufficient funds in place to launch and sustain operations. Lower demand areas will be more difficult to expand into or will need to be more highly subsidized.

9. Business Model

One of the key early decisions for a city exploring bike sharing is to determine a governance structure for the program – who will own the assets? Who will administer the program? Who will be responsible for day-to-day operations and financial transaction with users?

There are generally five business models used for bike share systems in the United States. Each system has slight variations to fit the unique needs of the local market, e.g., the municipal and regional procurement offices, capacity and interest of local partners, and the funding environment. A summary of some U.S. bike share business models is included in Table 9.1 below.

Table 9-1: Bike Share Operating Models

Number	Name	Stations / Bikes	Ownership of Capital Infrastructure	Operations
1	Seattle, WA Pronto	50/500	Non-Profit: Puget Sound Bike Share (transitioning to ownership by the City of Seattle)	Private: Motivate
2	Arlington County, VA, Capital Bike Share	81/3000 (# of stations is for Arlington County only)	Private & Non-Profit Partnership: Arlington Transportation Partners and Bike Arlington	Private: Motivate
3	Cambridge & Somerville, MA Hubway	45 / 1300 (# of stations is for Somerville & Cambridge only)	Public: Owned by the municipalities that system operates in (Boston, Cambridge, Somerville and Brookline)	Private Operator (Motivate), who has separate contractual agreements with each city within the network
4	Topeka, KS Metro Bikes	10 / 100	Public: Topeka Metro	Public: Topeka Metro
5	Boulder, CO B-Cycle	39 / 275	Non-Profit: Boulder B-Cycle	Non-Profit: Boulder B-Cycle

In general, the five primary business models are:

1. **Non-Profit Owned / Privately Operated**: a non-profit takes on the financial risk of purchasing and owning the system and contracts operations to a private company that takes on liability for the system.

Model 1. Seattle Pronto bike share (transitioning to Model 3)

2. **For-Profit Owned and Operated**: a private company takes on the responsibility of providing and operating the system. The private sector takes on all risk and fundraising responsibility and retains all profits (although it is not uncommon for a portion of profits to be paid to the jurisdiction for use of right-of-way, advertising, etc.). This model is highly dependent on the capacity of private sector fundraising.

Model 2. Capital Bike Share

3. **Publicly Owned / Privately Operated**: a government agency takes on the financial responsibility of purchasing and owning the system and contracts operations to a private company that takes on liability for the system (note: certain operating tasks, such as marketing, may be taken on by the jurisdiction).

Model 3. Boston Hubway

4. **Publicly Owned / Publicly Operated**: a government agency takes on the financial risk of purchasing, owning and operating the bike share program

Model 4. Topeka Metro Bikes

5. **Non-Profit Owned and Operated:** an existing or a newly formed non-profit takes on the responsibility of one or more of the roles of ownership, administration, and operation. Financial risk is taken on by the non-profit, although government agencies may provide start-up funds or act as a fiscal agent for the pass-through of federal, state, or local funding.

Model 5. Boulder B-cycle

The advantages and disadvantages of the five major models are summarized in Table 9-2 in terms of ownership of assets, operating responsibility, agency role, transparency, share of profit and risk, use of operating expertise, fundraising responsibility, expansion potential, and staff capacity / organizational interest. Table 9-3 and Table 9-4 provide further detail on the pros and cons of either ownership or operations separately.

Table 9-2: Advantages and Disadvantages of Typical Bike Share Governance Models

Model Number	Ownership Model	Ownership	Operations	Agency Role	Transparency	Risk	Profits	Operating Expertise	Fundraising	Expansion Potential	Staff Capacity / Interest	Examples
1	Non-Profit Owned / Privately Operated	Non-profit	Private contractor	Agency has a less active role and may only be responsible for certain aspects of system planning such as station siting and permitting.	Some transparency through representation on Executive Committee	Financial and liability risk is shifted to the non-profit organization and for profit operator	Non-profit retains (or splits) profits, which can be used to fund system improvements and expansion.	Makes use of private expertise to compliment non-profit's skills and passion.	Same as above	Expansion (within the jurisdiction) is contractually simple and depends only on additional funds being raised.	Staff dedicated specifically to the mission of bike sharing.	Seattle Pronto Cycle Share (Transitioning to public ownership however); no other examples
2	For-Profit Business	Private	Private	Agency has a less active role and may only be responsible for certain aspects of system planning such as station siting and permitting.	Operator controls decision-making, re-investment / expansion, and operations.	All risk is taken on by the private sector.	Retained by private company.	Makes use of private sector experience.	More restrictive on the type of funds available for use - generally relying on private investment, user revenues, sponsorship and advertising.	Expansion focused towards profitability	Small business with entrepreneurial mentality	Deco Bike (Miami Beach)
3	Publicly Owned / Privately Operated	Public agency	Private contractor	The public agency is responsible for capital investment, owns the infrastructure and equipment, administers contract with private operator, and makes decisions and drives direction of the program.	This model allows for the greatest amount of agency control. The agency drives the direction of the program and sets the terms of the operating contract.	Financial risk is taken on by the public agency. Liability exposure is taken on by the private contractor.	Agency retains (or splits) profits, which can be used to fund system improvements and expansion.	Makes use of private expertise to compliment agency skills.	Agency responsible for fundraising. Typically a mix of federal, state, local grants; sponsorships; and user revenues.	Expansion (within the jurisdiction) is contractually simple and depends only on additional funds being raised.	Requires agency staff capacity for fundraising and oversight of the system, but makes use of the private sector experience for operations.	Divvy (Chicago), Hubway (Greater Boston) CoGo (Columbus OH) Grid Bike Share (Phoenix)
4	Publicly Owned / Publicly Operated	Public agency	Public agency	The public agency is responsible for capital investment, owns the infrastructure and equipment, and oversees all aspects of operations.	This model allows for the greatest amount of agency control over equipment, expansion, operations and service levels.	Financial risk and liability exposure is taken on by the public agency.	Agency retains potential profits, which can be used to fund system improvements and expansion.	Public agency would likely lack start-up and operating expertise, which can affect level of service.	Agency responsible for fundraising. Typically a mix of federal, state, local grants; sponsorships; and user revenues.	Expansion (within the jurisdiction) can be easily permitted.	Requires agency staff capacity for fundraising, oversight of the system and operations and marketing staff management	Spokies (Oklahoma City), Boise Bike Share, ID Topeka Metro Bike
5	Non-Profit Owned and Operated	Non-profit	Non-profit	Agency can be involved as a financial partner providing start-up funding for the non-profit or acting as a fiscal agent to pass through federal, state, and local funding. Agency may be represented on the non-profit board or as a technical advisor.	Some transparency through representation on Executive Committee	Financial and liability risk is shifted to the non-profit organization.	Profits are generally reinvested into improvement and expansion of the system.	Non-profit often lacks start-up and operating expertise, which can affect level of service.	Provides the most diverse fundraising options. Agency or non-profit (or both) can fundraise and private sector is often more willing to sponsor / donate to non-profits. All funding types are in play under this model.	Expansion (within the jurisdiction) is contractually simple and depends only on additional funds being raised.	Staff dedicated specifically to the mission of bike sharing.	Denver B-cycle, Madison B-cycle Kansas City B-cycle Nice Ride (Minneapolis/St. Paul)

Table 9-3: Pros and Cons of Business Model options: OWNERSHIP

Ownership Model	PROS	CONS
Public Agency	• Highest level of public control and transparency • Profits could be returned to the City or regional entity as revenue, or reinvested into the system for expansion • For a multi-jurisdictional system, a regional agency has greater ability to coordinate among the jurisdictions • May have stronger connections and higher-level experience to bring in federal or state funding • Higher likelihood to coordinate a unified bike share and public transit pass • Strong oversight of contract operator	• Agency may not see it within their mission to govern a bike share system (unless they typically deal with multi-modal transportation) • Concern may exist about potential liability to the city, county, etc. • Requires significant time commitment by agency staff • Some corporate or institutional sponsors may feel uncomfortable dealing with and giving money to a government agency
Non-Profit	• Transparency can be easily achieved through representation on the Board • High likelihood that staff and board will be committed and passionate about bike share as their sole mission • Easily able to accommodate a regional system • More likely to respond to issues related to system equity and promotion of public health • Corporate or institutional sponsors are accustomed to giving to non-profits • Profits can be reinvested into the system for expansion	• Requires investment of time and funding, likely from government partners, sponsors, and other stakeholders • May not be effective at raising local, state, or federal funding • Board composition is critical to help bring in private sponsors • May take longer than other models to organize an ownership, management and Board structure • Without an existing non-profit to build off of, starting a new one can be challenging
For-Profit	• A private company takes on risks, leaving very few to the public sector • Can assemble capital relatively quickly • Focus on profitability will increase service and efficiency in high demand areas (especially those frequented by visitors and tourists)	• Government grant monies must be brokered through government agencies • Need to be profitable may limit ability to prioritize equity and public health issues

Table 9-4: Pros and Cons of Business Model options: OPERATIONS

Operations Model	PROS	CONS
Public Agency	• If the public agency's primary mission is transportation, they may have some level of relevant experience (e.g. the Bi-State Development Agency runs Metro transit, the tram to the top of the Arch and bike rentals at the Arch) • Opportunity to integrate with established transportation/transit practices	• Minimal precedent - few cities in the US have used a public agency or regional transit authority to operate their bike share systems • Public agencies lacks experience and knowledge of bike share operations • Costs related to staffing and union rules will likely make operations more expensive • Multi-jurisdictional bike share programs require multi-jurisdictional agencies
Non-Profit	• Potentially lower cost • Foundation grants and individual donations more likely • With a small system (<200 bikes), non-profit can team with bike shops and/or advocacy groups to assist with maintenance and rebalancing	• Learning curve • If operations performance is poor, it may be difficult for a non-profit to change course quickly • With a larger system (>200 bikes), non-profit may have difficulty assembling experienced staff • Less likely for bike share to become fully integrated into transportation system
For-Profit	• Can handle multi-jurisdictional systems relatively easily • If operations performance is poor for an extended period, a new vendor can be hired for operations • More knowledge and experience with operational issues from other systems • Economies of scale with multiple systems • Can mobilize equipment and staff from other systems if needed	• Need to be profitable may limit ability to prioritize equity and public health issues • Foundation grants and donations less likely

Proposed Governance Model

Due to a variety of factors, the recommended model for Redmond is public ownership with operations contracted out to a private bike share operations company. This is consistent with Seattle's Pronto system, in which the Seattle Department of Transportation owns the equipment and contracts out operations to a private vendor, Motivate (originally the equipment was owned by a non-profit).

Ownership: With the significant sum of state funding available for a bike share program within Eastside communities ($5.5 million available for Redmond, Bellevue, Issaquah and Kirkland), the City of Redmond is well positioned to leverage the funds necessary for outright purchase and ownership of the preferred equipment. Based on the cost estimates presented later in this memorandum, the capital costs required for purchasing and launching Phase 1A of bike share downtown is roughly $1,000,000.

Purchase and launch of Phase 1B—either the same year or the year after—is estimated to cost an additional $900,000. The majority of Phase 1B stations will be located on or adjacent to the Microsoft campus. Based on available information, Microsoft appears open to funding the portion of a bike share system on their campus at a minimum. As such, the options for ownership for Phase 1B include:

- Microsoft to purchase and own all equipment that sits on or adjacent to their property[17] (12 out of the 14 stations planned for Phase 1B). They would subsequently contract with Motivate for the launch and operations
- Microsoft to purchase all equipment that sits on or adjacent to their property and donate it to the City of Redmond. The City would then lease the equipment to Microsoft with the fees being used specifically to provide operations to the Microsoft campus stations (on a per dock, per month basis via Motivate rate schedule)

In either scenario, the City of Redmond should provide in-kind staff time in the period after the completion of this study. The City staffer will track the state funding requests, manage the equipment purchase order and be the liaison to the operator. The budget presented in the next section also includes a $65,000 administrative fee for the lead-up year to the initial launch. In all likelihood, this fee will be covered through sponsorship funding raised during the lead-in to the program launch. With these one-time funds secured, the $65,000 will be used to hire an interim Executive Director (ED) who will gradually take over the tasks performed by the City's designated staffer. The annual cost of the ED will later be absorbed by the system operator and become part of ongoing operations costs.

As a back-up option, the City could explore the possibility of setting up a non-profit 501c-3 that will represent the interests of all relevant Eastside communities and other stakeholders within the regional bike share system outside of Seattle. The non-profit could ultimately be overseen by a board comprised of key political, corporate, institutional and community leaders. In Redmond, critical board members could include: Microsoft, other potential sponsors, staff from multiple Eastside cities, King County transit, and non-profit partners such as bicycle advocacy groups.

During the potential transitional time period to non-profit status it is critically important that a high-level representative or representatives from the City of Redmond be an active leader on the board. In some locales, the launching of bike share has been delayed due to lack of high-level city leadership. Without high-level leadership driving the program forward, sponsorship dollars are much harder to acquire and permitting challenges can bog down the process. Leadership from high-level officials on the other hand, sends the strong message to the business community that bike share is a high priority for the City. For instance, the City of Boston initially secured funding for their bike share program through a federal grant. The Mayor's office was heavily engaged in the launch of the bike share system, and established Boston Bikes in-part to specifically oversee the program, becoming the liaison between the City of Boston and the system's operator, Alta Bicycle Share (now Motivate). This strong leadership from the Mayor's office enabled the City to secure operations funding from private donors, such as New Balance, providing critical resources as the federal funds dissipated. Boston Bikes also leveraged the Mayor's office influence to ensure that stations were sited in ideal locations. Across the country, successful bike share systems arose through direct collaboration between City leaders that prioritized

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[17] Stations owned by Microsoft will be available for use by any member of the bike share program, not just Microsoft staff, contractors and visitors

the systems and program sponsors who helped fund them. Creating a board to oversee the launch of the system is an important step that engages key stakeholders.

Operations: It is recommended that operations of the bike share system be contracted to a for-profit vendor. This takes advantage of the experience and economies of scale coming with a qualified operations vendor, and would likely be the most efficient way to handle administrative oversight, marketing, risk reduction, training, maintenance and operations. In the event that an expansion of Pronto is chosen for Redmond, the City should work with the City of Seattle during their upcoming procurement process to secure the same vendor to provide operations in Redmond. If, instead, the City decides to develop its own bike share program using lower-cost smart-lock technology, the City should proceed with a competitive procurement process that includes an RFP for an equipment and operations team. If this were the case, it could result in an operations vendor for the Eastside communities that is different than Pronto in Seattle. If Redmond moves forward with a different equipment and operations provider than Seattle, it is possible that a non-profit operator could be a good fit, as non-profits can more-easily operate smaller systems.

10. System Costs

There are four major costs associated with a bike share program in Redmond: start-up costs (broken into **launch** and **capital** costs), **administrative** costs for the equipment owner, and **operating** costs. This section summarizes cost estimates for each of these components and presents a five-year financial forecast for the proposed system.

One important over-arching assumption is that an established, "turn-key" bike share technology will be chosen as the preferred equipment for the system, i.e., that there will be no research and development costs associated with creating a new technology. This could include either a heavy, steel-plate based station with electro-magnetic docking units, or a cluster of analog bicycle racks to form a station-like hub for "smart-lock" bike share bicycles.

Launch Costs

There are a number of "start-up" costs associated with establishing the system. These are mostly one-time costs (or are significantly less for future phases) that include up-front costs such as hiring staff, procuring a service center and storage warehouse, purchasing bike and station assembly tools, website development, communications and IT set-up, and pre-launch marketing. There may be opportunities to reduce some of these costs through partnerships with other organizations, existing systems or public agencies, e.g., to use a city-provided warehouse space. Each expansion phase also has a start-up cost, including site planning and permitting, bike and station assembly, station installation, and so forth.

There will also be costs associated with administering the program by the equipment owners. A total of $65,000 has been budgeted for this service as the lead-in to Phase 1A with no additional costs as the lead-in to Phase 2. (Because the vast majority of Phase 1B is to be launched on the Microsoft campus, any additional costs are assumed to be absorbed by Microsoft.) The primary administrative cost is for the equipment owners (i.e. the City of Redmond) to hire directly or to pay the Operations vendor for an additional staff person to oversee the procurement and launch during the year prior to the first fully-operational season. The costs also relate to recruiting and securing full and part-time staff and the special marketing efforts that are most prevalent during the launch year and the build-up to subsequent expansions. Longer-term, the private vendor who will operate the bike share program will have administrative costs associated with staff positions, marketing, and general expenses. These are included in operating costs as described below.

For the proposed system in Redmond, launch costs are expected to be a one-time cost of $266,600 (or $1,600 per bike X 126 bikes plus $65,000) for Phase 1A in Downtown Redmond and another $201,600 for Phase 1B in the Overlake/Microsoft campus area.

Capital Costs

These are the costs associated with purchase of equipment including stations, transaction kiosks, map frame panels, helmets/helmet bins, bikes[18] and docks (or racks). Equipment costs vary depending on:

- The equipment selected ("high" cost range for steel plate/dock-based stations such as Pronto vs. "low" cost range for smart-lock based stations such as SoBi)

- System parameters such as the number of bikes per station or the number of docks per bike

- Additional features such as incorporating an independent lock, or equipping bikes with GPS (both of which are quite minor relative to the bullets above)

Per station capital costs vary between vendors and depending on features and station size, but typically range from $30,000 (low end at $3,333 per smart lock bike, gross) to $50,000 (high end at $5,600 per Pronto bike, gross) per station.

For the proposed system in Redmond, capital costs are expected to range from $425,000 – $700,000 for the proposed 14 stations and 126 bikes for Phase 1A in Downtown Redmond and $425,000 - $700,000 again for Phase 1B in the Overlake/Microsoft campus area (note: does not include potential price changes related to inflation).

Operating Costs

Operating costs include those required to operate and maintain the system. This includes staff and equipment related to:

- **Station maintenance**: including troubleshooting any technology problems with the kiosk or docking points, cleaning and clearing the station, removing litter and graffiti, etc.

- **Helmet distribution:** includes the time needed to gather used helmets, bring them back to the shop, clean/sanitize them and resupply of the helmet bins at each station.

- **Bike maintenance:** including regular inspection and servicing of bikes as well as maintaining equipment inventory, etc.

Regular maintenance is required by roaming mechanics for both bikes and stations

- **Rebalancing:** staff time and equipment associated with moving bikes from full to empty stations and vice versa. This is typically a problem associated with peak demand at commute periods and during events. Rebalancing costs can be mitigated with a smart-lock system through the use of

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[18] At this point in time, bicycles are not anticipated to include an electric, pedal-assist system, though it is currently being discussed as the potential future for bike share in Seattle and perhaps other Eastside cities.

pricing that encourages riders to return bikes to the hubs.

- **Customer service:** providing a responsive customer interface for inquiries and complaints as well as performing marketing and outreach to new and existing customers.

- **Direct expenses**: such as maintaining an operations facility, purchasing tools and spare parts, upkeep of software, communications and IT, and general administrative costs such as insurance and membership database management.

Operational costs will depend on numerous factors, but are most influenced by the Service Level Agreement (SLA) negotiated with the system operator. The SLA sets out the operating terms that must be met: how long a station can remain empty, how often bikes are inspected, cleaning policy and others. The agreed-upon service levels will need to balance operating costs with the impact on customer service.

Depending on the service-level expectations, operating costs typically range from $100 to $130 per dock or rack per month. This is based on experience with steel plate and electromagnetic docking systems that currently exist throughout the U.S. For the proposed system utilizing dock-based technology in Redmond, $125 per dock per month is used as an average for operating costs. This is based on an estimate provided by the operators of Seattle's Pronto Cycle Share system, whose equipment may be the model used by the City of Redmond. One reason Pronto's operations costs fall at the high end of the range stated above is due to the labor costs associated with cleaning and sanitizing used helmets that must be provided at each station.

Operational costs for systems using smart lock bicycles are likely in the same range[19] but such costs remain somewhat vague because fewer citywide systems have been in operation for more than a year. Although operations costs for smart lock systems such as Social Bicycles (SoBi) are known to be as low as $80 per rack in the City of Phoenix, in Redmond, the cost is expected to be higher due to the need to more-frequently swap each smart lock bike's battery due to overcast weather and the need to provide and maintain a supply of legally-required helmets at each station. For these reasons, the cost estimates provided in this report assume that operations costs for both smart lock and dock-based options will be equal.

In Seattle, the helmet dispensing and deposit bins create a significant operational cost that most other bike share programs do not have.

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[19] There are some areas in which operations costs are likely to be less for smart-lock systems and others that are expected to be more. For instance, there is minimal cost to maintain the smart bike station bike racks vs. station-based docks that include electromagnetic locks and other hardware. On the other hand, the additional costs to maintain the locking mechanism and software installed onto each smart lock bicycle will be significant. Also, depending on whether the pricing scheme includes incentives to park at smart lock stations, the costs to relocate bikes parked throughout the service area and return them to the designated station sites may be more expensive than typical rebalancing of dock-based systems.

For Phase 1A, this amounts to $340,200-378,000 per year for a 227-252 dock system. (A dock-to-bike ratio of 1.8-2.0 is recommended for bike share, so 227-252 docks could accommodate the 126 bikes anticipated for Phase 1A.) An additional $340,200-378,000 for 227-252 more docking points will be needed for Phase 1B in the Overlake/ Microsoft campus area. This equates to annual operations costs of approximately $2,700-3,000 per bike.

Cost Summary

Five-year cost forecasts for a bike share system in Redmond for both Phase 1 and 2 are shown in Table 10-1 and 10-2 below. Note that capital, launch, and administration costs occur in the year prior to operations, i.e. these costs occur in Year "0" for a system whose operations begin in Year 1.

Table 10-1: *Five-Year Cost Estimate for Redmond Bike Share – Smart Lock System equipment*

Year	0	1	2	3	4	5	0-5
Phase	1A	1A	1B	2	na	na	All
# of new stations (City of Redmond)	14	0	2	7	0	0	23
# of new stations (Microsoft campus)	0	0	12	5	0	0	17
# of new stations (TOTAL)	14	0	14	12	0	0	40
# of stations (Cumulative TOTAL)	14	14	28	40	40	40	40
# of bikes	126	126	252	360	360	360	360
# of racks (1.8 per bike)	227	227	454	648	648	648	648
COSTS							
launch costs	$266,600	$0	$201,600	$172,800	$0	$0	$641,000
capital costs	$424,900	$0	$424,900	$364,200	$0	$0	$1,214,000
operations costs	$0	$340,200	$680,400	$972,000	$972,000	$972,000	$3,936,600
Costs sub-total	**$691,500**	**$340,200**	**$1,306,900**	**$1,509,000**	**$972,000**	**$972,000**	**$5,791,600**
Costs Cumulative	**$691,500**	**$1,031,700**	**$2,338,600**	**$3,847,600**	**$4,819,600**	**$5,791,600**	

Table 10-2: *Five-Year Cost Estimate for Redmond Bike Share – Dock Based equipment*

Year	0	1	2	3	4	5	0-5
Phase	1A	1A	1B	2	na	na	All
# of new stations (City of Redmond)	14	0	2	7	0	0	23
# of new stations (Microsoft campus)	0	0	12	5	0	0	17
# of new stations (TOTAL)	14	0	14	12	0	0	40
# of stations (Cumulative TOTAL)	14	14	28	40	40	40	40
# of bikes	126	126	252	360	360	360	360
# of docks/racks (2 per bike)	252	252	504	720	720	720	720
COSTS							
launch costs	$266,600	$0	$201,600	$172,800	$0	$0	$641,000
capital costs	$700,000	$0	$700,000	$600,000	$0	$0	$2,000,000
operations costs	$0	$378,000	$756,000	$1,080,000	$1,080,000	$1,080,000	$4,374,000
Costs sub-total	$966,600	$378,000	$1,657,600	$1,852,800	$1,080,000	$1,080,000	$7,015,000
Costs Cumulative	$966,600	$1,344,600	$3,002,200	$4,855,000	$5,935,000	$7,015,000	

11. System Revenues

One of the goals of many bike share systems, often out of necessity, is to use a diverse range of revenue sources. Potential revenues include user-generated trip and membership fees, grant funding, private foundation contributions and donations, advertising or sponsorship, and other sources. This section provides an overview of potential revenue sources based on experience in other U.S. cities. A funding strategy that identifies what combination of revenues might be available within Redmond is presented in the following section.

User Revenues

Some systems, such as CaBi in Washington DC and Divvy in Chicago, receive such high ridership that user revenues cover the cost to operate the systems. While this is not possible in most cities, user-generated revenues can provide a significant level of income.

Forecasting user-generated revenues for a bike share program in Redmond requires: (a) establishing a rate model and schedule, (b) estimating the expected number of trips that would be made by members and casual (i.e., 24 or 72 hour) users, and (c) determining how many members and casual users can be expected to sign up for the program.

Rate Schedule

Users typically pay two types of fees to use a bike share system:

- **Access fees**: paid up-front to register to use the system. These are offered for a variety of time periods ranging from hourly plans to 24-hour subscriptions to annual memberships.
- **Usage fees:** charged to the user based on how long they use the system. Most systems offer a "free ride" period, typically 30 minutes where the user pays no additional costs if the bike is returned within that time period. Fees are charged to users who exceed the pre-established free-ride period, and increase exponentially with each additional 30 minute period of use.

The logic of the rate schedule is to: (1) make annual membership attractive to the general public, (2) make the rates comparable to other bike share system rates in the US, (3) encourage short trips and high turnover with a pricing schedule that dissuades extended use and avoids competition with existing bike rental vendors, (4) provide reasonable and comparable prices to other public transportation modes, and (5) discourage trips longer than the 30 minute free-ride period. Following are the types of payment models and memberships that have been implemented in other bike share systems:

- Model 1, unlimited 30-60 minute trips

  o Annual (365 days, or less for seasonal systems)
  o Monthly (30 days)
  o 72 hour (3 days)
  o 24 hour (1 day)

- Model 2, pay per trip or per minute ("pay as you go")

In most dock-based systems, monthly and annual memberships are purchased online via a credit card. (Note that in nearby Seattle, there is no monthly membership option). The operator mails an RFID-based card or a key fob to the member at the address given on the website. All other memberships—weekly, 72 hour and 24 hour—are purchased at the kiosk.

A handful of bike share programs, both 'dock based' and 'smart lock' systems, have recently experimented with a "pay as you go" model, where members or casual users only pay for their use of a bicycle. Some have charged by the trip (typically in the $2.50-$4.00 range), while others charge by the minute (e.g., $0.10/minute after a $1.00 access fee). The bike share industry has debated whether the more-typical, "all-you-can-eat-buffet" model is preferred over the "ala-carte menu" model from a revenue and equity perspective. The latter has only been utilized for 1-2 years, so it is still uncertain which model serves customers, owners, and operators best. While both models have their pros and cons, the recommendation for Redmond is to use the model that provides an unlimited amount of 30-minute trips for both annual/monthly members and casual users with 24/72-hour passes.

Table 11-1: Current Membership Options and Fees for North American Bike Share Systems (note that system pricing options are evolving in some bike share system with some subject to change in a short time period)

System	Member: Annual	Member: Monthly	Casual: Weekly pass	Casual: 72-hour pass	Casual: 24-hour pass
Redmond (Proposed)	**$85**	**-**	**-**	**$16**	**$8**
Seattle Pronto	$85	-	-	$16	$8
Arlington County VA/ Capital Bikeshare	$85	$28	-	$17	$8
Greater Boston Hubway	$85	$20	-	$12	$6
Topeka Metro Bikes	$25 (2 hrs/day max.)	$5 (students)	-	-	$2.50/hour
Boulder B-cycle	$70	-	$20	-	$8
Philadelphia Indego	$10 plus $4/trip for 60 minutes	$15	$4 per 30 minutes		

All of the systems listed have pricing structures that encourage short trips, with no extra fees if bikes are returned within the free ride period, typically 30 minutes per trip or up to two hours per day. Also, some systems offer discounted introductory rates to encourage first-time members. In Boston, there are $65 memberships available, while in Topeka, the annual fee of $25 dollars is much lower, but use of the system for members is capped at 2 hours/day. Beyond 2 hours, members must pay for additional use.

Table **11-2** summarizes overtime usage fees for North American bike share systems and suggests a proposed rate structure for Redmond.

Table 11-2: Usage Fees for North American Bike Share Systems

System	Usage Fees (cumulative)				Each 30 minutes thereafter	Max 24-hour charge	Out of Hub Fee
	0-30 min	30-60 min	60-90 min	90-120 min			
Redmond (Member)	**$0**	**$2.00**	**$7.00**	**$12.00**	**$5.00**	**$77**	**$3 (if applicable)**
Redmond (Casual User)	**$0**	**$2.00**	**$7.00**	**$12.00**	**$5.00**	**$77**	**$3 (if applicable)**
Seattle Pronto	$0	$2.00	$7.00	$12.00	$5.00	$77	na
Capital Bikeshare (Annual member)	$0	$1.50	$4.50	$10.50	$6.00	-	na
Capital Bikeshare (Casual user)	$0	$2.00	$6.00	$14.00	$8.00	-	na
Hubway (Annual member[20])	$0	$1.50	$4.50	$12.50	$6.00	$80	na
Hubway (Casual user)	$0	$2.00	$6.00	$14.00	$8.00	$100	na
Topeka Metro Bikes (annual plan)	$0	$0	$0	$0	$5.00	NA	$3
Topeka Metro Bikes (hourly plan)	$2.50	$0	$5.00	$0	$2.50 per hour	$60	$3
Boulder B-cycle	$0	$3.00	$6.00	$9.00	$3.00	$141	na

It is also important to note that the smart lock systems functionally require a price be placed on parking the bike between established station hubs, or outside of the service area. This pricing is to discourage users from taking the bike far outside of the service zone and to circumvent the need for a potentially expensive collection service to pick-up and return bikes to the designated service area. The bike has a built-in GPS which enables the operator to locate a locked bike at any particular moment and determine if an additional fee should be applied. For the Topeka Metro Bike system or Grid bike share in Phoenix (smart-lock equipment by Social Bicycles), the operators charge an additional $3 fee to park a bike between stations within the designated service area, and a steep $20 fee to park the bike in a random location outside of the designated service area. In the first four months after launch of Grid, less than 5% of all trips ended with a bike parked outside of the designated hubs.

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[20] In the City of Boston, the Hubway bike share system allows qualifying low-income members to make a trip of up to 60 minutes without incurring an additional fee. This policy was instituted partially to accommodate the fact that many bike share trips from low-income areas required bicycling for more than 30 minutes to reach job-rich centers

Membership and Ridership Forecast

Bike share ridership depends on a number of factors including the physical and built environment of the city, the location and visibility of stations, and services (such as marketing) provided by the equipment vendor and/or system operator. The preliminary demand model used for Redmond was based on observed monthly station and user demands in cities in which data is available, including the Capital Bikeshare in Arlington County VA/Washington DC, the Hubway system in Greater Boston, GREENbike in Salt Lake City and CoGo in Columbus, OH. Although not all of these are considered peer cities with Redmond, each has a bike share system that has been fully functional for more than two full years. Each also displays particular metrics about use patterns, the number of trips per annual member, the longevity of typical trips and other factors that are relevant for cities similar in size as Redmond.

The model was applied to the proposed Station Location Plan in Redmond and extrapolated to annual forecasts using monthly bicycling profiles recorded by other bike share cities. Bike share systems typically take a number of years to mature to their full demand potential and as such, a "ramp up" profile was applied to the forecasts based on experience in other cities. Observed trip-per-member rates were applied to the forecast to estimate the number of annual members and casual subscribers.

The demand model for trip and membership forecast for Phase 1A (14 stations in Downtown Redmond at the start of Year 1) and Phase 1B (an additional 14 stations in the Overlake/Microsoft campus area at the start of Year 2) and Phase 2 (an additional 12 stations throughout the city at the start of Year 3) is presented in *Table 11-3*. Although it is possible that most of the Overlake/Microsoft campus area stations (Phase 1B) may be in place before the deployment of the Phase 1A, the latter was analyzed as the initial launch in order to isolate the ridership and revenue potential for a fully-operational bike share system in downtown Redmond only.

Table 11-3 shows an annual forecast demand of approximately 35,000 trips in Year 1 (14 stations) ramping up to approximately 166,000 trips in Year 5, when the system has grown to 40 stations. **The number of daily trips taken per bike is expected to start out at roughly 0.76 daily trips per bike in Year 1 and increase to 1.26 trips per bike per day in Year 5.** This is comparable to what was experienced in Seattle after the first full year of operations, where the daily trip per bike figure was 0.8. Although Pronto's service area includes much higher density areas than Redmond, and contains more destinations, the proposed Phase 1A:

- Includes a denser network of stations than Seattle's system

- Does not include steep topography which typically depresses ridership at stations near hills

- Has the benefit of the region's population having an awareness and understanding of bike share

User revenues were estimated by applying the proposed rate structure to these forecasts and are summarized in **Table 11-3** as well. Over five years, user revenues are expected to generate between $150,000 and $320,000 per year, or nearly $1.3 million cumulatively.

Revenue for the system would theoretically be much higher; however 90% of the forecasted trips within Phase 1B (where 12 of the 14 planned stations sit within or immediately adjacent to the Microsoft campus) are estimated to be Microsoft staff or visitors. Based on initial information from Microsoft, this

report makes the assumption that the company will provide bike share memberships and passes to employees and visitors at no cost to the user. The other 10% of Phase 1B trips that are expected to generate revenue will come from non-Microsoft staff purchasing annual memberships or short term passes. Although all stations are expected to be publicly accessible, most of these Phase 1B "revenue" trips will originate or terminate outside of the Microsoft campus, either at the two stations planned in Overlake Village or at the Overlake Transit Center station.

Table 11-3: *PRELIMINARY Five-Year Usage Forecast for Redmond Bike Share*

	Year 1	Year 2	Year 3	Year 4	Year 5
Stations/Bikes	*14/126*	*28/252*	*40/360*	*40/360*	*40/360*
Trips					
Phase 1A (14 stations)	35,000	45,000	60,000	65,000	65,000
Phase 1B (14 stations)	0	30,000	35,000	45,000	50,000
Phase 2 (12 stations)	0	0	33,000	41,000	51,000
Total	35,000	75,000	128,000	151,000	166,000
Trips / Bike / Day	0.76	0.82	0.97	1.15	1.26
Annual Members					
Number	600	1200	2500	2700	2800
Trips	25,000	50,000	93,000	109,000	123,000
Casual Users					
Number	5,000	11,000	16,000	20,000	22,000
Trips	10,000	25,000	35,000	42,000	43,000
Revenues					
Annual Membership and trip fees (DT Redmond)	$60,000	$70,000	$90,000	$100,000	$100,000
Annual Membership and trip fees (Overlake/MS)	$0	$5,000	$6,000	$7,000	$8,000
Casual Membership and trip fees (DT Redmond)	$110,000	$140,000	$175,000	$210,000	$210,000
Casual Membership and trip fees (Overlake/MS)	$0	$9,500	$11,000	$14,000	$17,000
Projected Refunds	($20,000)	($15,000)	($15,000)	($15,000)	($15,000)
Total Annual User Revenue	**$150,000**	**$209,500**	**$267,000**	**$316,000**	**$320,000**

Cumulative User Revenue	$150,000	$359,500	$626,500	$942,500	$1,262,500

Forecast Validation

Forecasts for Redmond were compared to first-year usage and membership statistics for existing systems in Chicago, Boston, Columbus OH, Denver, Madison, Montreal, Minneapolis and Salt Lake City for the following metrics:

- Trips / bike / day: the year 1 forecast for Redmond of 0.76 trips / bike / day is within the range of other systems. This is significantly less than first year statistics for higher-performing systems such as Boston Hubway (2.6 trips / bike / day) or Salt Lake City (1.7 trips / bike / day), but a bit more in line with modestly-performing systems such as Columbus's CoGo (1.0 trips / bike / day), Denver (0.9 trips / bike / day), Seattle (0.8 trips / bike / day) or Chattanooga (0.8 trips / bike / day). **Table 11-4** includes a comparison with other bike share systems.
- Members per bike ratio: the Redmond system is expected to have a member-per-bike ratio of nearly 4.8:1, which is within the range of some bike share systems, but lower than others (see *system has been in operation for only one full year

- Table 11.5).
- Trips per member ratio: the Redmond bike share system is expected to operate at approximately 41.7 annual trips per annual member, which is lower than higher-performing systems such as Boston Hubway (64 trips/member) or Nice Ride Minnesota (50 trips/member) but more in line with Denver B-cycle (46 trips/member) and Chattanooga (32 annual trips/member). See **Table 11.5.**

Table 11-4: Trip Comparison with US Bike Share Systems (Inaugural Season)

	Year (Season)	Operating Days	Annual Trips	Bikes	First Year Trips / Bike / Day	Mature System Trips / Bike / Day
Redmond (estimate)	TBD	365	35,000	126	0.76	1.26
Seattle Pronto	2014-15 (1st)	365	144,000	500	0.79	na*
Chattanooga	2013 (1st)	365	73,000	265	0.76	0.6
Denver B-Cycle	2010 (1st)	224	103,000	500	0.92	1.5
Boston Hubway	2011 / 2012 (1st)	240	380,000	610	2.60	3.8
Madison B-Cycle	2012 (2nd)	258	63,000	290	0.84	unknown
Columbus CoGo	2013-2014 (1st)	365	50,000	220	1.04	unknown
Nice Ride MN	2010 (1st)	150	101,000	600	1.12	1.4
San Antonio	2011 (1st)	274	32,000	140	0.83	unknown

SLC GREENbike	2013 (1st)	242	25,361	55	1.91	2.5
Topeka KS	2015 (1st)	270	15,510	100	0.57	na*
Boulder CO	2013 (1st)	365	43,143	150	0.78	1.0

system has been in operation for only one full year

Table 11.5: Membership Comparison with US Bike Share Systems

	Year (Season)	Bikes	Annual Members	Members / Bike	Total Annual Member Trips	Trips / Annual Member
Redmond	**TBD (1st)**	**126**	**600**	**4.8**	**25,000**	**42**
Seattle Pronto	2014-15 (1st)	500	3,000	6.0	unknown	nA*
Chattanooga	2013 (1st)	265	550	2.1	17,500	32
Denver B-Cycle	2011 (2nd)	520	2,675	5.1	122,000	46
Boston Hubway	2012 (1st full)	610	3,815	6.3	244,000	64
Madison B-Cycle	2012 (2nd)	290	2,150	7.4	39,000	18
Nice Ride MN	2010 (1st)	600	1,295	2.2	65,000	50
SLC GREENbike	2013 (1st)	55	*Membership data not available*			
Topeka KS	2015 (1st)	100	698	7.0	unknown	na
Boulder CO	2013 (1st)	150	1455	9.7	unknown	na

system has been in operation for only one full year

The comparison of predicted statistics for a bike share system in Redmond confirms that the usage and revenue estimates can be used to develop a realistic business model.

Grants and Public Funding

Numerous public funding options are available for bike sharing in the United States, but the most common are federal grants issued by agencies such as FHWA, FTA, or CDC, state grants, and local transportation funds.

The FHWA provides a summary of public funding sources in its guide to Bike Sharing in the United States (2012): http://www.fhwa.dot.gov/environment/bicycle_pedestrian/funding/faq_bikeshare.cfm

Most cities have limited the use of local public funding to providing local matches to federal grants (such as CMAQ) as well as providing in-kind services such as staff time, right-of-way use, or displacement of on-street parking revenues. (Columbus, Ohio is one exception as they committed $2.3m of local funds from the Capital budget to purchase the equipment.) Local funding would most likely be directed towards capital costs or a specific annual amount for operations. Agencies are less likely to want the responsibility—and potential uncertainty—of funding annual operating costs.

In other cities, ongoing public funding has come from local "steady stream" sources such as parking revenues, bus bike rack advertising, special taxes, or a portion of the fees imposed for new license plates. Station purchase could also form part of a developer's transportation demand management (TDM) strategy. This strategy has been used to fund six new bike share stations in Cambridge, Massachusetts.

Fortunately for the City of Redmond, the Washington State Legislature has allocated $5,5 million for expansion of bike share to the Eastside communities of Kirkland, Bellevue, Issaquah and, Redmond. As of November 2015, the specific quantities for each city have yet to be determined. As the city that has done the most planning and likely to be the first to launch on the Eastside, Redmond is well positioned to have the funding it needs to procure and launch Phase 1A and much or all of Phase 1B.

Advertising and Sponsorship Revenues

There is a subtle difference between advertising and sponsorship. Advertising includes a contract with a company to provide a regularly changing graphic display and message, which could be independent of the bike share station on other street furniture. The advertiser or message may not be associated with bike sharing or bicycling in general. Sponsorship typically involves a longer-term relationship between the sponsor and the vendor, where stickers are put on the infrastructure (bikes, stations, or website) with a logo or statement that "Company X supports Redmond bike share." Currently, advertising is not permitted in the public right-of-way in Redmond. For some programs, advertising is an important part of the overall funding package and can bring-in $100-$200 per station in monthly revenue ($33,600-$67,200 per year for ads on all 28, Phase 1A/1B stations). Depending on the level of sponsorship, a re-assessment of the current advertising prohibition may need to be studied in order to provide additional revenue for Redmond's bike share program.

Sponsorship provides a significant funding opportunity in Redmond given the large employers and interested corporate partners. Experience in other cities has shown that companies are generally interested in sponsorship for its positive impression and "good corporate citizen" benefits as much as for its media exposure. The value of sponsorship will vary significantly between cities and the level of branding. It is possible that sponsorship in the range of $5,000 to $15,000 per station per year is achievable in Redmond based on experience in other cities:

- Nice Ride Minnesota obtained approximately $5,500 per station per year for presenting sponsorship from BlueCross BlueShield (this does not include additional station sponsorship sales that would increase this rate).
- Denver B-cycle reported sponsorship of approximately $11,700 per station in 2011.
- Citibank paid approximately $13,500 per station per year for exclusive sponsorship of New York's bike share system.
- Hubway in Boston obtained over $16,500 per station per year for station sponsorship from various sources ranging from New Balance to Harvard University to individual developers.
- CoGo in Columbus OH received $8,333 per station per year for station sponsorship by the Medical Mutual company
- GREENbike in Salt Lake City received $25,000 per station for a three-year term ($8,333/year) and received sponsorship for 8 of the inaugural ten stations

There are generally four approaches to sponsorship described in **Table 11-5**.

Table 11-5: Common Bike Share Sponsorship Models in the United States

Sponsorship Model	Description	Advantages	Disadvantages
Title Sponsor	This can be a single sponsor that pays for full branding of system infrastructure (e.g., London or New York) or multiple sponsors that split the cost in exchange for proportional branding (e.g., Boston or Toronto). **Commitment is typically a 3-5 year period.**	• Title: One-time sale of sponsorship • Known timeline and full "occupancy" • Consistent and recognizable branding	• Often difficult to secure sponsor given the large investment • Less opportunity for smaller businesses to get involved • Competing brands can conflict certain tenants or nearby businesses
Presenting Sponsor(s)	Sponsor(s) pays for branding of certain parts of the infrastructure e.g., Hubway (Presented by New Balance), Nice Ride (Presented by Blue Cross Blue Shield of Minnesota), Pronto Emerald City Bike Share (Presented by Alaska Airlines.) **Commitment is typically a 3-5 year period.**	• System branding with sponsors allows for future flexibility • A strong, active sponsor adds marketing and outreach value • Opportunities for businesses of all sizes to be involved • Solid funding stream to complement user fees and government investment • Can bring in multiple sponsors	• Significant effort required to secure and retain sponsors • Not enough money to fully fund system, typically
Station/Hub Sponsors	This model sells sponsorship opportunities on system infrastructure, e.g., Denver Bike Share sells logo placement on a station kiosk plus 10 bikes for $30,000 per year or discounted for multiple years. **Commitment is typically a 3 year period.**	• Opportunities for businesses of all sizes to be involved • Opportunity to value sponsorship by station demand	• Income relies on uptake of a certain amount of sponsorship each year • Significant effort required to secure and retain sponsors
Other sponsors	Numerous options available, such as one-time sponsors (e.g., Volkswagen paid for day-passes in Chattanooga for a weekend), product partners, media sponsors, and other ideas. **Commitment is typically a 1-3 year period.**	• Opportunities for businesses of all sizes to be involved • Builds strength in community by valuing bike share	• Significant effort required to secure and retain sponsors

It should be noted that the only systems that have been able to procure enough sponsorship dollars through title sponsor arrangements in order to cover the up-front capital costs have been CitiBike in

New York and Barclays in London. These size, density and media presence of these large cities are not comparable to most other American cities, including Redmond. Some systems have secured sponsor dollars to match government grants, while others have found success by launching first, then bringing in sponsors to help sustain or expand. Examples are Chicago's Divvy Bike Share (after one year, they secured sponsorship from Blue Cross Blue Shield of Illinois) and Columbus Ohio's CoGo Bike Share (after one year, they secured sponsorship from Mutual Medical.) Denver B-cycle and numerous other B-cycle systems have been successful at bringing in numerous small-scale and station sponsors to supplement user revenues, grants, and government funding. All of these have involved high-level political leadership to procure the sponsorships.

Non-profits such as the Indianapolis Cultural Trail (which manages the 250-bike Indiana Pacers Bike Share system which launched in 2014) have been very successful at using a combination of sponsor dollars and foundation grants to both launch and help fund operations. The key to success is having deep-pocketed, community-connected foundations, high-level political support, and local leadership.

Table 11-6 outlines the variety of sponsorship agreements from some U.S. bike share programs.

Table 11-6: Sponsorship funding sources for US bike share programs

Program	Year Launched	Sponsorship Type	Sponsorship Agreement	Annual Sponsorship
Pronto, Seattle	2014	Presenting Sponsor	$2.5m for five years from Alaska Airlines with support for helmet vending machines from Seattle Children's Hospital	$500,000 ($1,000 per bike)
Divvy, Chicago	2013	Presenting Sponsor	$12.5 million for five years from Blue Cross Blue Shield of Illinois	$2.5 million ($833 per bike)
CoGo, Columbus OH	2013	Presenting Sponsor	$1.25 million for five years from Medical Mutual	$250,000 ($833 per bike)
Denver B-Cycle	2010	Presenting Sponsor	$1.3 million from Kaiser Permanente with some additional funds from Foundations	Unknown
Hubway, Greater Boston	2011	Presenting Sponsor and numerous Station Sponsors	$600,000 for three years from New Balance with various $50,000-92,000 station sponsorships from numerous institutions and corporations	$200,000 from NB and misc. from others
Kansas City B-Cycle	2012	Presenting Sponsor	$350,000 per year from Blue Cross Blue Shield (<u>one time donation</u>)	NA
Chattanooga Bike Transit	2013	Title Sponsor	$100,000 from the Lyndhurst Foundation that provided match for federal funds (<u>one time donation</u>)	NA
Pacers Bike Share Indianapolis	2014	Title Sponsor	Herbert Simon Family Foundation via the Indiana Pacers NBA franchise (total unknown)	Unknown
Nice Ride, Minneapolis	2010	Presenting Sponsor	$4 million total since 2010 from Blue Cross Blue Shield donations	Varies at $350-800,000/year

Boulder B-Cycle	2013	Presenting Sponsor	Unknown quantity from Kaiser Permanente and Whole Foods	Unknown
GREENbike, Salt Lake City	2013	Presenting Sponsor	For 3 year period: $250,000 from SelectHealth (logo on rear fender) and $100,000 from RioTinto (front basket)	$116,333 combined ($1,163 per bike)

System Revenue Summary

Although some bike share programs in large cities with high levels of tourism are able to recoup a significant portion of their operations costs through user fees, smaller cities with minimal visitors or tourists will need to rely on sponsorship to pay for operations. Revenue recovery in such cities typically ranges from 20% - 50%. Based on the modeling completed for this study, Redmond is anticipated to fall into this category. The majority of the remaining gap will be covered through sponsorship and potentially advertising revenue, if sponsorship goals fall short and the City revises its current prohibition on advertising on within the public right of way. Based on the annual "per bike" sponsorship from other cities described above, Redmond should seek $800-$1,200 per bike.

The Preliminary Financial Plan in the following section articulates the financial gap necessary to fund both capital and operations for bike share in Redmond. Because of the unknowns related to both sponsorship and advertising revenues, both are left as blank placeholders in the tables.

12. Preliminary Financial Plan

The Financial Plan compares forecast system costs and revenues over the course of a five-year period to determine annual cash flow and resulting surplus or shortfall expected from the bike share program in Redmond.

Cash Flow Analysis

Previous sections of this Technical Memorandum presented expected system costs (Section 10) along with user-generated and sponsorship revenues (Section 0). These are compared over the first five years of operations for a 14-station system that expands to 28 stations during the second year of operations and to 40 stations during third full year of operations and remains that size through year five. **For all phases, the purchase, launch and operations costs of the 12 stations projected to be placed within or immediately adjacent to the Microsoft campus are assumed to borne by the company. This potential sponsorship has yet to be confirmed by Microsoft.** If full sponsorship funds for these 12 stations (minimum) is not available, it is likely that Phase 1B would be put on hold until after any station expansion in Downtown Redmond.

Many Phase 1B stations, such as the Microsoft Conference Center, may be fully funded by Microsoft

In Summary, the purchase, launch and five-years of operations for Phase 1A, 1B and 2 will require between $4.4 and $7.0 million, depending on the selected equipment. Known revenues will come from a combination of state funding, likely sponsorship by Microsoft, and user-generated revenues.

Based on the demand model, user-generated revenue projections will range from roughly $160,000 to $393,500 per year, with a cumulative five-year projection of over $1.4 million. This creates the financial need for $1.2 - $2.8 million over a five-year period (depending on the selected equipment) that will need to be filled with a likely mix of public and private dollars. Previous sections 4.2 – 4.4 outlines opportunities to raise capital and operations money through additional Federal grants, sponsorship and potential advertising revenues.

Table 12-1 and Table 12-2 on following pages: Five Year Financial Forecast for two program scenarios: Smart-lock and Pronto equipment. (Note that annual inflation were not factored into the costs below)

Table 12.1 – Smart-lock Equipment Scenario

Year	0	1	2	3	4	5	0-5
Phase	**1A**	**1A**	**1B**	**2**	**na**	**na**	**All**
# of new stations (City of Redmond)	14	0	2	7	0	0	23
# of new stations (Microsoft campus)	0	0	12	5	0	0	17
# of new stations (TOTAL)	14	0	14	12	0	0	40
# of stations (Cumulative TOTAL)	14	14	28	40	40	40	40
# of bikes	126	126	252	360	360	360	360
# of racks (1.8 per bike)	227	227	454	648	648	648	648
COSTS							
launch costs	$266,600	$0	$201,600	$172,800	$0	$0	$641,000
capital costs	$424,900	$0	$424,900	$364,200	$0	$0	$1,214,000
operations costs	$0	$340,200	$680,400	$972,000	$972,000	$972,000	$3,936,600
Costs sub-total	**$691,500**	**$340,200**	**$1,306,900**	**$1,509,000**	**$972,000**	**$972,000**	**$5,791,600**
Costs Cumulative	**$691,500**	**$1,031,700**	**$2,338,600**	**$3,847,600**	**$4,819,600**	**$5,791,600**	
REVENUE PROJECTIONS							
User-fees (City of Redmond stations)	$0	$170,000	$210,000	$265,000	$310,000	$310,000	$1,265,000
User-fees (Microsoft stations*)	$0	$0	$14,500	$17,000	$21,000	$25,000	$77,500
Projected Refunds	na	-$20,000	-$15,000	-$15,000	-$15,000	-$15,000	-$80,000
"Farebox Recovery" rate	na	44.1%	30.8%	27.5%	32.5%	32.9%	32.1%
Microsoft Sponsorship (Capital/launch)	$0	$0	$537,000	$223,750	$0	$0	$760,750
Microsoft Sponsorship (Operations)	$0	$0	$291,600	$413,100	$413,100	$413,100	$1,530,900
Other Sponsorship Opportunities	$0	$0	$0	$0	$0	$0	$0
Advertising	$0	$0	$0	$0	$0	$0	$0
Public funds/grants	$0	$0	$0	$0	$0	$0	$0
Revenue sub-total	**$0**	**$150,000**	**$1,038,100**	**$903,850**	**$729,100**	**$733,100**	**$3,554,150**
Revenue Cumulative	**$0**	**$150,000**	**$1,188,100**	**$2,091,950**	**$2,821,050**	**$3,554,150**	
FINANCIAL GAP							
Annual need	-$691,500	-$190,200	-$268,800	-$605,150	-$242,900	-$238,900	-$2,237,450
Cumulative need	**-$691,500**	**-$881,700**	**-$1,150,500**	**-$1,755,650**	**-$1,998,550**	**-$2,237,450**	

* - assumes that 90% of all usage are Microsoft staff who pay no out-of-pocket fees

Table 12.2 – Pronto Equipment Scenario

Year	0	1	2	3	4	5	0-5
Phase	1A	1A	1B	2	na	na	All
# of new stations (City of Redmond)	14	0	2	7	0	0	23
# of new stations (Microsoft campus)	0	0	12	5	0	0	17
# of new stations (TOTAL)	14	0	14	12	0	0	40
# of stations (Cumulative TOTAL)	14	14	28	40	40	40	40
# of bikes	126	126	252	360	360	360	360
# of docks/racks (2 per bike)	252	252	504	720	720	720	720
COSTS							
launch costs	$266,600	$0	$201,600	$172,800	$0	$0	$641,000
capital costs	$700,000	$0	$700,000	$600,000	$0	$0	$2,000,000
operations costs	$0	$378,000	$756,000	$1,080,000	$1,080,000	$1,080,000	$4,374,000
Costs sub-total	**$966,600**	**$378,000**	**$1,657,600**	**$1,852,800**	**$1,080,000**	**$1,080,000**	**$7,015,000**
Costs Cumulative	**$966,600**	**$1,344,600**	**$3,002,200**	**$4,855,000**	**$5,935,000**	**$7,015,000**	
REVENUE PROJECTIONS							
User-fees (City of Redmond stations)	$0	$170,000	$210,000	$265,000	$310,000	$310,000	$1,265,000
User-fees (Microsoft stations*)	$0	$0	$14,500	$17,000	$21,000	$25,000	$77,500
Projected Refunds	na	-$20,000	-$15,000	-$15,000	-$15,000	-$15,000	-$80,000
"Farebox Recovery" rate	na	39.7%	27.7%	24.7%	29.3%	29.6%	28.9%
Microsoft Sponsorship (Capital/launch)	$0	$0	$772,800	$322,000	$0	$0	$1,094,800
Microsoft Sponsorship (Operations)	$0	$0	$324,000	$459,000	$459,000	$459,000	$1,701,000
Other Sponsorship Opportunities	$0	$0	$0	$0	$0	$0	$0
Advertising	$0	$0	$0	$0	$0	$0	$0
Public funds/grants	$0	$0	$0	$0	$0	$0	$0
Revenue sub-total	**$0**	**$150,000**	**$1,306,300**	**$1,048,000**	**$775,000**	**$779,000**	**$4,058,300**
Revenue Cumulative	**$0**	**$150,000**	**$1,456,300**	**$2,504,300**	**$3,279,300**	**$4,058,300**	
FINANCIAL GAP							
Annual need	-$966,600	-$228,000	-$351,300	-$804,800	-$305,000	-$301,000	-$2,956,700
Cumulative need	-$966,600	-$1,194,600	-$1,545,900	-$2,350,700	-$2,655,700	-$2,956,700	

* - assumes that 90% of all usage are Microsoft staff who pay no out-of-pocket fees

13. Summary

This report outlines a business plan for the creation of a bike share program in the City of Redmond. It presents information on the proposed system size and phasing; outlines options for a business model that will be used to own, administer and operate the system; presents a business *pro-forma* and financial plan for funding the system and identifies operational considerations for the program.

The recommended system will consist of an initial launch of 14 stations and 126 bikes at key locations downtown (Phase 1A) and 14 additional stations in the Overlake/Microsoft campus area (Phase 1B). Depending on Microsoft's ability to move forward with potential funding for launch and operations for stations on or near their campus, Phase 1B could potentially occur prior to Phase 1A. Regardless of which occurs first, what is critical is the initial launch includes a core number of stations that are placed in a compact network and serve key destinations either downtown or in the Microsoft campus and Overlake area. Splitting the difference with 6-8 stations downtown and 6-8 stations in Overlake would dilute the system and would result in an underutilized system. Phase 2 will then increase the size of the network with a series of incremental expansions totaling an additional 12 stations and 108 bikes in the commercial zones to the southeast and northwest of downtown, and as additional infill in the Microsoft campus area.

Station sites will include a mixture of sidewalk and on-street sites at an average spacing of approximately one station every ¼ mile, with some stations at the edges up to ½ mile apart. This density provides access to a bike within a short walk of anywhere in the service area (including key destinations) and provides a nearby alternative to return a bike if the destination station is full. Consistent with Seattle's Pronto bike share system, Redmond bike share is expected to be a year-round program.

The density and active uses along Cleveland Street downtown provides the ideal context for bike share

Phase 1A, 1B and 2 of the system is expected to cost $5.8 to $7.0 million over five years—depending on selected equipment and technology—including capital, launch, and operating costs. Projected revenue of $170,000 (year 1) to $310,000 (year 5) per year will provide a significant portion of the operating fees, but a projected $2.2 to $3.0 million funding gap will need to be defrayed over the five-year period. Gap funding will primarily come from three or more sources: station sponsorship, additional grant funds, advertising revenues, and potentially city funding. It is also important to note that because a significant portion of the planned network in the Overlake District will sit within or adjacent to the Microsoft campus, it is expected that the company will defray the primary costs to purchase and operate the portion of the

system that benefits their staff and visitors. Because this study's recommendation is for City of Redmond ownership of the equipment, Microsoft will likely lease the equipment serving their campus (and the Overlake Transit Center) and fund operations through a sponsorship agreement with the City.

This study recommends that a pricing structure mimic the one used by most other bike share programs in the U.S. including Pronto's in Seattle, i.e. unlimited 30-60 minute trips for designated members (the so-called "all you can eat buffet" model vs. the more-experimental "ala carte menu" tried by a few program operators in which users pay per trip or per minute). Members will be able to access the system for a recommended cost of $85 for an annual membership, $16 for a three-day pass and $8 for a 24-hour pass. Members will be able to take as many trips as they like with the first 30 minutes free, after which a graduated pricing scheme charges users for longer trips. That pricing schedule is based on the likely expansion of Seattle's Pronto Cycle Share program to the Eastside. If different equipment were chosen, such as smart-lock equipment, a pricing scheme based on a "pay as you go" model where users pay by the minute or by the trip could be possible.

From inception to launch, the Phase 1A/1B, 28 station, 252 bike system will take 8-18 months to implement. Specific next steps that will need to be met before a potential spring/summer 2017 launch include:

- Establish a program champion: an individual or small group with strong political and corporate connections, and who is dedicated to building bike share in Redmond;
- Along with Microsoft's current commitment to invest in bike share, seek partners in the public and private sector who can deliver on commitments to help (similar to cities such as Boston, Pittsburgh and others, direct outreach by elected officials can help to bring in additional sponsor funding opportunities);
- Establish the necessary agreements with other cities, both current and future, and Microsoft to ensure compatibility between programs and/or to maximize bargaining power with potentially-consolidated equipment orders;
- Refine a fundraising strategy that includes potential grant applications and presentations to potential foundation, institutional or corporate sponsors;
- Continue to aggressively implement new bike facility projects within the designated service area to promote access and safety for less-experienced riders;
- System plan approval and individual station permitting from the City of Redmond as needed;

Within the time frame established above, the launch itself will take 8 months and include:

- Purchase equipment and lease warehouse and office space;
- Hire and train an administrative team;
- Maintain ongoing branding, marketing, and advocacy to promote wide interest in bike share;
- Build upon Pronto's current website or design a new website that provides essential information, along with specific tools—such as mobile applications, membership registration, and interactive maps—to enhance the user experience
- Manufacture, delivery, assembly and installation of equipment
- Creation of system name and logo (if different from Pronto)

- Undertake pre-launch marketing and host a launch event/celebration

Numerous cities in the United States recognize the health, environmental, and economic benefits of bike sharing. The City of Redmond has some of the key characteristics required to make a bike sharing program successful and has an opportunity to expand upon its moniker as the "Bicycle Capital of the Northwest".
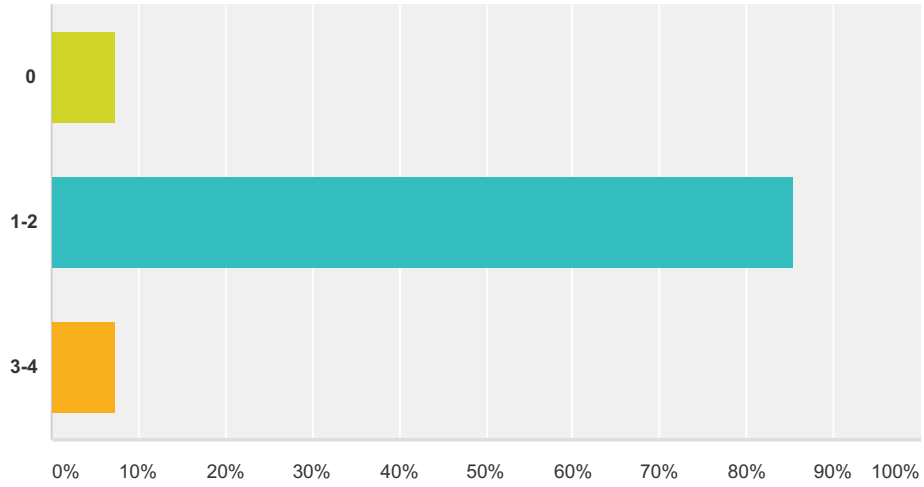
Appendix A:

Survey Results

Q1 Respondent Info

Answered: 54   Skipped: 2

Answer Choices	Responses	
Name	**94.44%**	51
Neighborhood	**90.74%**	49
Email	**57.41%**	31

Q2 How many trips do you make to and around Downtown Redmond, Redmond Town Center, and Marymoor Park on a typical day?
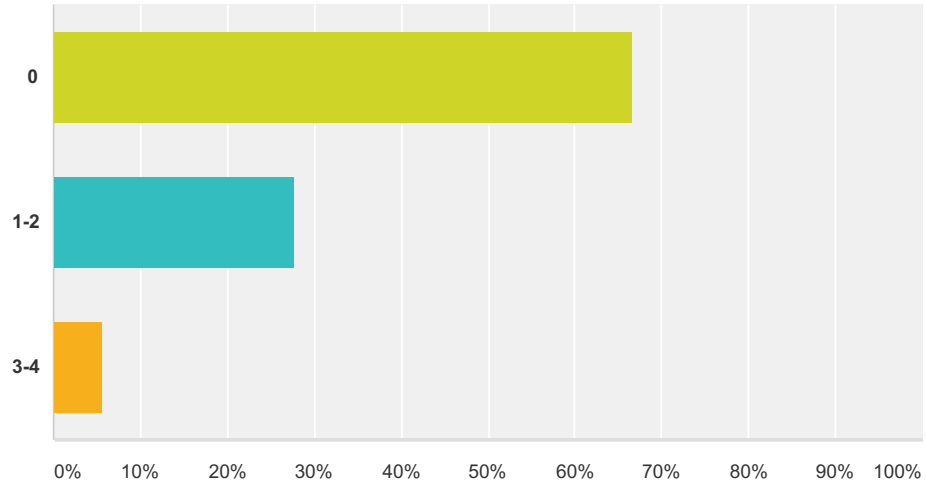
Answered: 55   Skipped: 1

Answer Choices	Responses	
0	**7.27%**	4
1-2	**85.45%**	47
3-4	**7.27%**	4
Total		**55**

Q3 How many trips do you make to and around Overlake and the Microsoft Campus on a typical day?

Answered: 54   Skipped: 2

Answer Choices	Responses	
0	**66.67%**	36
1-2	**27.78%**	15
3-4	**5.56%**	3
Total		**54**

Q4 How often do you ride a bicycle (including leisure and commuting purposes)?

Answered: 56   Skipped: 0
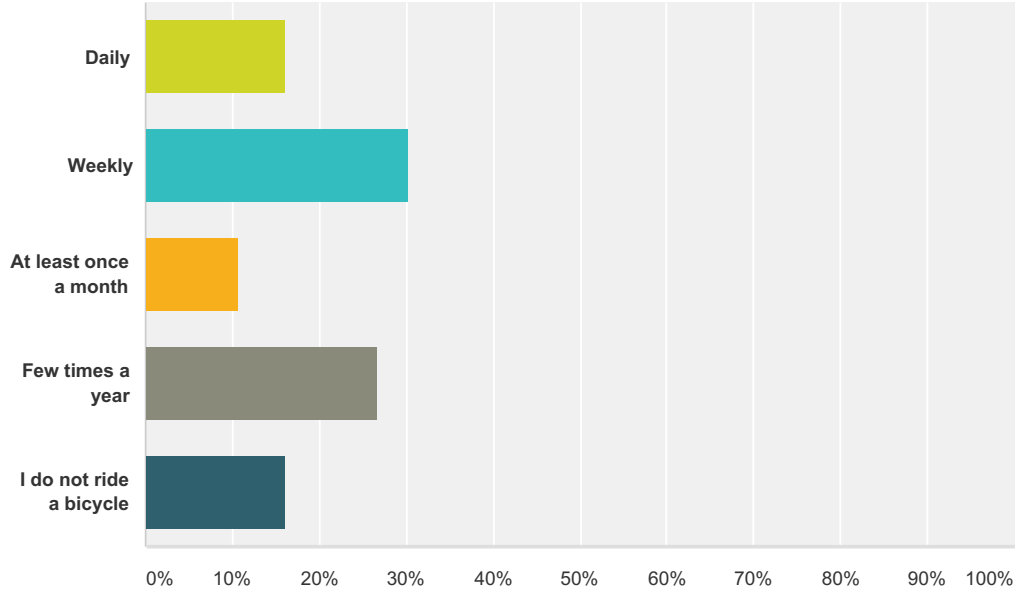
Answer Choices	Responses	
Daily	**16.07%**	9
Weekly	**30.36%**	17
At least once a month	**10.71%**	6
Few times a year	**26.79%**	15
I do not ride a bicycle	**16.07%**	9
Total		**56**

Q5 If Redmond had a bike share program, how likely would you use it?

Answered: 56   Skipped: 0
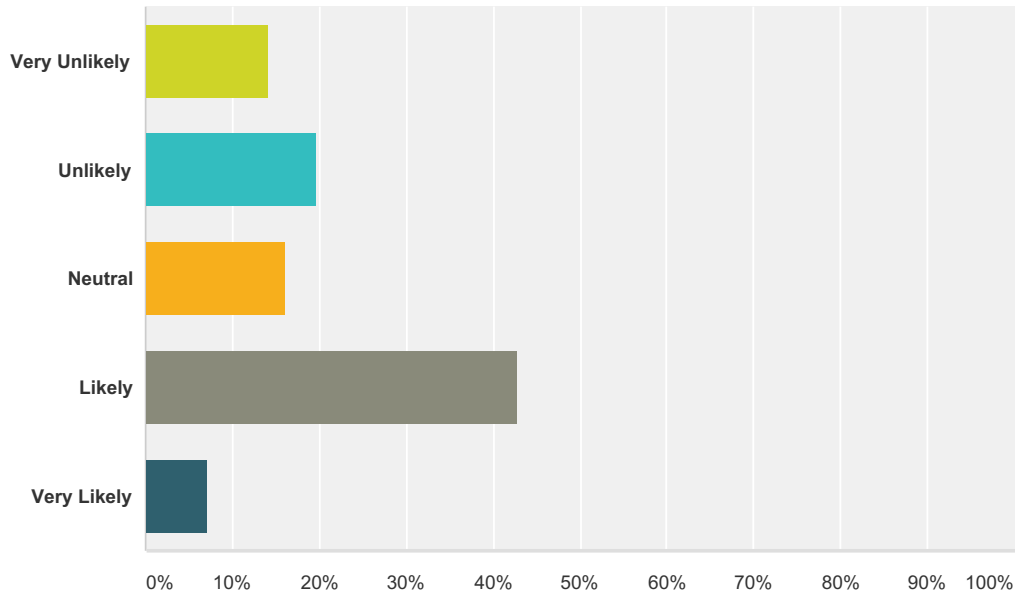
Answer Choices	Responses	
Very Unlikely	**14.29%**	8
Unlikely	**19.64%**	11
Neutral	**16.07%**	9
Likely	**42.86%**	24
Very Likely	**7.14%**	4
Total		**56**

Q6 If bike share was available, what are the top three areas you use bike share most often?

Answered: 46   Skipped: 10
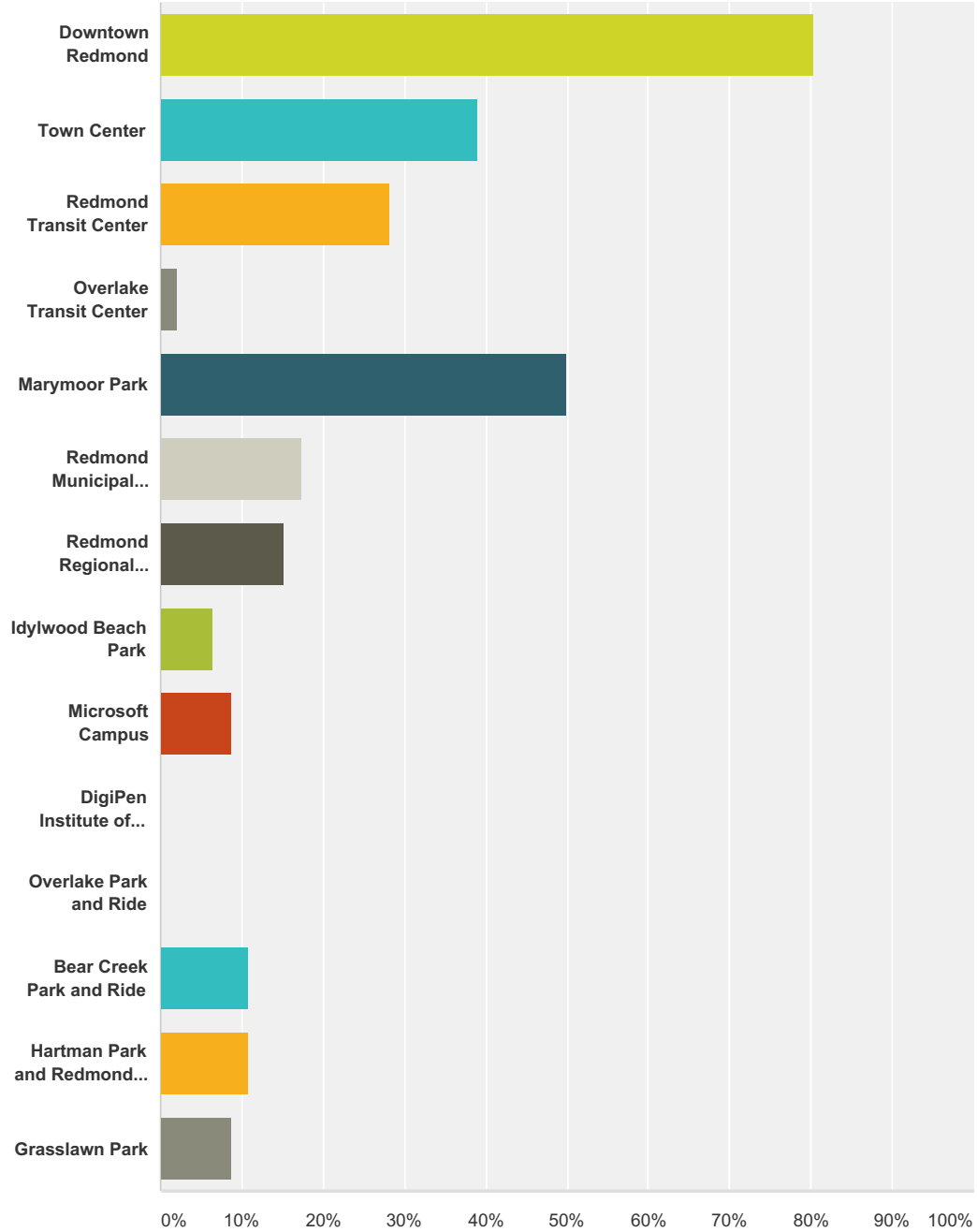
Answer Choices	Responses	
Downtown Redmond	**80.43%**	37
Town Center	**39.13%**	18
Redmond Transit Center	**28.26%**	13

Overlake Transit Center	**2.17%**	1
Marymoor Park	**50.00%**	23
Redmond Municipal Complex	**17.39%**	8
Redmond Regional Library	**15.22%**	7
Idylwood Beach Park	**6.52%**	3
Microsoft Campus	**8.70%**	4
DigiPen Institute of Technology	**0.00%**	0
Overlake Park and Ride	**0.00%**	0
Bear Creek Park and Ride	**10.87%**	5
Hartman Park and Redmond Pool	**10.87%**	5
Grasslawn Park	**8.70%**	4
Total Respondents: 46		

Q7 What barriers, if any, would restrict your regular use of bike share? Please select all that apply.

Answered: 43   Skipped: 13
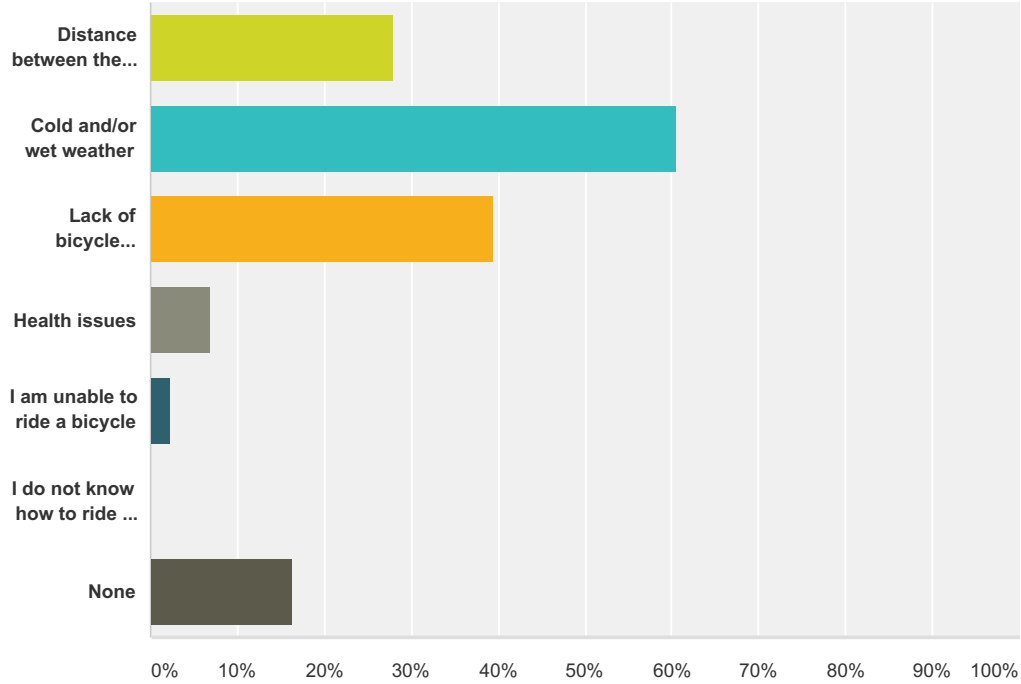
Answer Choices	Responses	
Distance between the frequently-visited destinations too far to bicycle	**27.91%**	12
Cold and/or wet weather	**60.47%**	26
Lack of bicycle infrastructure (e.g. bike lanes)	**39.53%**	17
Health issues	**6.98%**	3
I am unable to ride a bicycle	**2.33%**	1
I do not know how to ride a bicycle	**0.00%**	0
None	**16.28%**	7
Total Respondents: 43		

Q8 What TWO factors would motivate or encourage you to try bike share?

Answered: 43   Skipped: 13
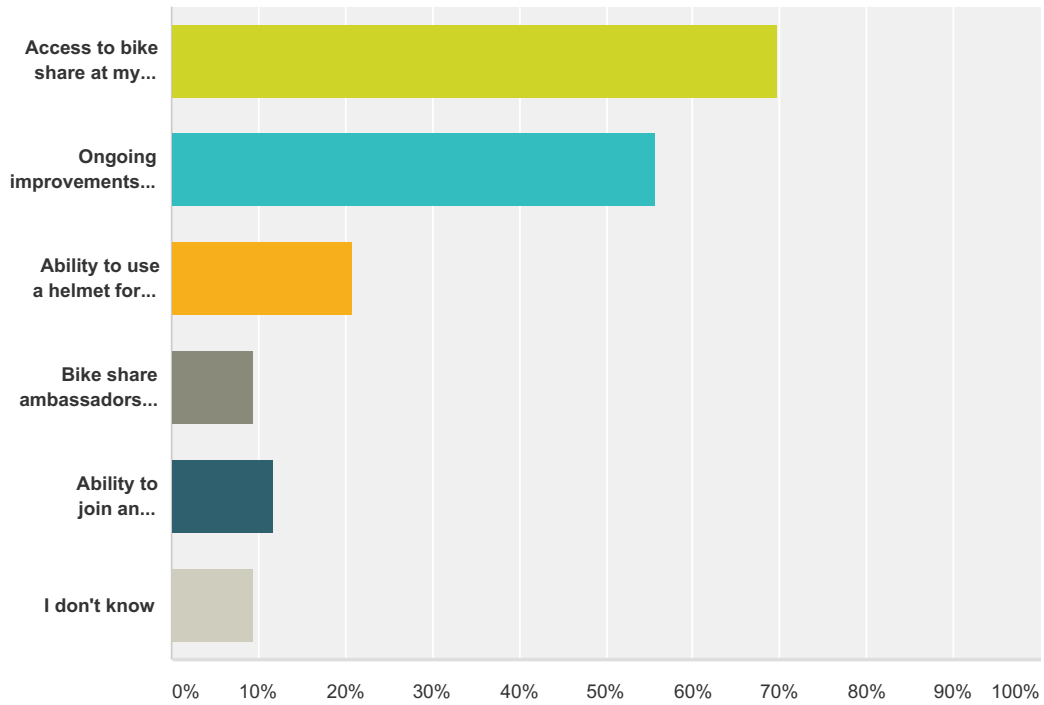
Answer Choices	Responses	
Access to bike share at my place of residence and/or employment	**69.77%**	30
Ongoing improvements to bike infrastructure	**55.81%**	24
Ability to use a helmet for every trip	**20.93%**	9
Bike share ambassadors available at various bike share stations to demonstrate how to use it	**9.30%**	4
Ability to join an informal group in my neighborhood that commutes via bike share	**11.63%**	5
I don't know	**9.30%**	4
Total Respondents: 43		