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# WALK BIKE COLUMBIA

COLUMBIA, SOUTH CAROLINA | BIKE SHARE PLAN



## INTRODUCTION FROM MAYOR STEPHEN K BENJAMIN

JANUARY 21, 2015

My fellow Columbians,

From creating our Bicycle Pedestrian Advisory Committee (BPAC) and completing Phase I of the Vista Greenway to installing new bicycle corrals and the first HAWK pedestrian signal in South Carolina, we've made great strides towards making Columbia a truly bicycle and pedestrian friendly city because we recognize that bicycling is not only a safe, fun and convenient way to travel, but also holds a unique potential to connect our diverse communities and make our city more livable, economically vibrant and environmentally sustainable.

Because of those efforts including our groundbreaking City Employee Bike Share Program and spectacular events like the Main Street Crit, our Annual Famously Hot Mayor's Bike Ride, Bike and Walk to School Day and our first Youth and Teen Bike Ride and Bike-A-Thon, today we are a nationally designated Bicycle Friendly Community and the University of South Carolina is the first Bicycle Friendly University in the state and one of only a few dozen around the country.

Today we see students riding their bikes to campus and young professionals jogging on Main Street every day but rather than sitting back and celebrating, we're pushing harder moving forward with developing our combined Pedestrian and Bicycle Master Plan and Bike Share Plan – Walk Bike Columbia – because we're not satisfied with more bicycle lanes and wider sidewalks.

We want to be the most bicycle and pedestrian friendly city in the Southeast and, with your help, we can make it happen.

Sincerely,

A handwritten signature in black ink that reads "Steve Benjamin". The signature is written in a cursive, flowing style.

Stephen K. Benjamin

Mayor

City of Columbia, SC

## Project Partners

The Walk Bike Columbia Pedestrian and Bicycle Master Plan and Bike Share Plan was commissioned by The Central Midlands Council of Governments (CMCOG) in partnership with the City of Columbia in 2014 with major funding granted by the Federal Transit Administration, and additional support provided by Palmetto Health and Abacus Planning.

Key partners that have been integral to this planning effort include the Central Midlands Regional Transit Authority (The

COMET), the City of Columbia Bicycle and Pedestrian Advisory Committee, South Carolina Department of Transportation, and The University of South Carolina. Collaboration with numerous other communities, agencies and local partners has also been integral to the development of this plan. Other key partners have included surrounding municipalities within the Columbia region; other State agencies such as the South Carolina Department of Health and Environmental Control; Allen University and other institutions of higher education; business

district associations; and , bicycle and transit advocacy groups such as Palmetto Conservation Foundation and Palmetto Cycling Coalition.

Finally, substantial and valuable input and feedback was gathered throughout the planning process from engaged and concerned citizens, and the Walk Bike Columbia Project Advisory Committee.

## Advisory Committee Members

- Jim Love, AARP
- Erin Letts, Abacus Planning
- Kimberly Tissot, Able SC
- Dana Higgins, City of Columbia
- John Fellows, City of Columbia
- Lucinda Statler, City of Columbia
- Jeff Caton, City of Columbia
- Robert Anderson, City of Columbia
- Gregory Sprouse, CMCOG
- Reginald Simmons, CMCOG
- Paige Tyler, Coldwell Banker United
- Samuel Scheib, COMET
- Natalie Britt, Palmetto Conservation Foundation, Chairperson Bike and Pedestrian Advisory Committee
- Mary Roe, Palmetto Conservation Foundation, Vice Chairperson Bike and Pedestrian Advisory Committee
- Amy Johnson, Palmetto Cycling Coalition
- Candace Knox, Palmetto Health
- Hope Hasty, Richland County
- Tom Dodds, SCDOT
- Ed Sawyer, SCDOT
- Mike Sullivan, SCDOT
- Mark Pleasant, SCDOT
- Rob Bedenbaugh, SCDOT
- Catherine Graham, SC Interagency Office of Disability & Health
- Lauren Angelo, United Way of the Midlands
- Jenny Rooney, University of South Carolina
- Gene Bell, Watson Tate Savory, Bike and Pedestrian Advisory Committee Representative

## Partnering Organizations





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West  
End  
Branch  
Library

Cambridge St.  
at Joy St.

# Bike Share Plan: Feasibility Study





# Feasibility Study Overview

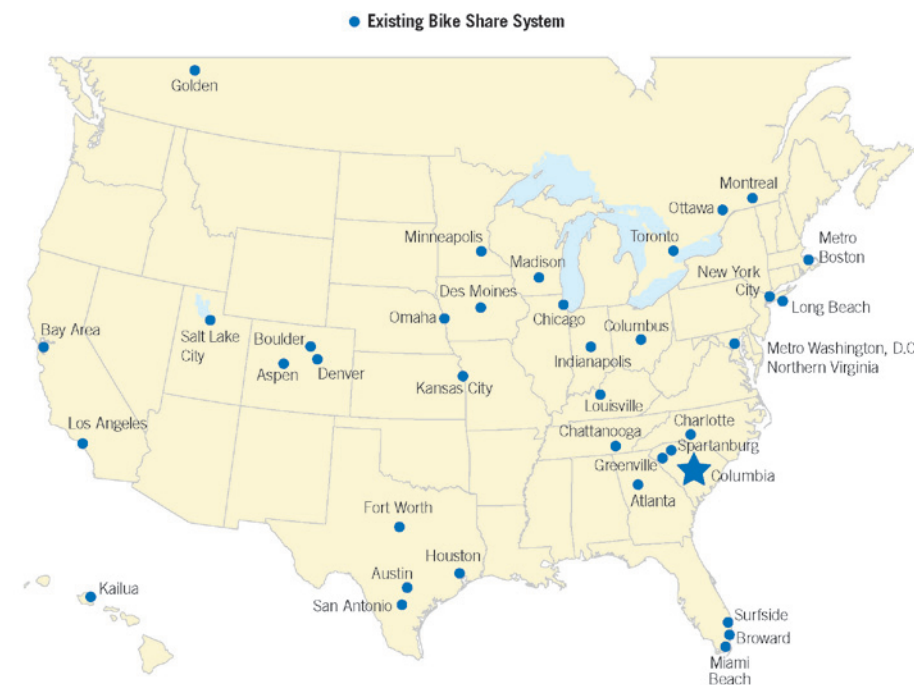
The purpose of this study is to explain bike share to residents of the Columbia region—what it is and the benefits it could bring—and assess existing conditions to determine the feasibility of launching bike share in this area. It compares and contrasts other existing bike share systems in peer regions to establish a benchmark for success. The analysis will inform regional leaders, stakeholders, and the public of the policy, cycling culture, bicycle infrastructure, multi-modal transit and economic enhancements that may be needed.

Overall, bike share provides a cost-effective, environmentally-friendly and convenient travel option for many short trips. A bike share system typically consists of a fleet of user-friendly and hardy bikes placed at conveniently-located stations. Bike share is a relatively inexpensive and quick infrastructure extension to a city’s public transportation system, allowing it to serve as a convenient ‘last mile’ connector and function as ‘transit by bike.’

Bike share systems are typically structured to operate like automated bike rental for short periods. The structure encourages shorter, spontaneous trips whereby bikes are checked out, ridden for a short period of time (typically 30



*Hubway bike share station adjacent to MBTA subway station in Boston*



minutes or less) and returned to any station in the system for someone else to use. Most systems employ some form of pricing schedule that encourages short, frequent trips and discourages bikes being in use for long periods of time. The focus is getting to nearby destinations quickly and conveniently. Generally, it is not intended to compete with bike rental, which is designed for those interested in using a bicycle continuously for longer periods of time.

According to the 2014 Benchmarking Report: Bicycling and Walking in the United States by the Alliance for Biking and Walking, 20 of the 50 most populous U.S. cities had a functional bike share system in 2013, which has increased from five cities in 2008. Additionally, over 20 additional cities are in the process of studying or launching a system. Bike share is quickly becoming a normal and expected transportation option in mid-size and large cities across the U.S.



## Evolution of bike share technology

Bike share is not a new concept and in fact has been around for more than 40 years. Figure 2 tracks the historic development of bike share system technology.

Most of the 1<sup>st</sup> generation “systems” were volunteer-led and informally organized. 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 accountability and given rise to a new generation of technology-driven bike share programs. Advancements in credit card transaction capabilities and RFIC (radio-frequency identification) chips have allowed operators to introduce accountability and reduce theft and vandalism.

The most recent bike share technologies, developed in North America, are modular systems that do not require excavation because they use solar power and wireless communication, as opposed to hardwired installation. With these new changes, stations can be moved, relocated, expanded, or reduced to meet demand. This ability allows systems to be flexible in terms of service coverage and availability and helps reduce capital costs related to construction.

**Bike share technology is evolving quickly along with other wireless and digital changes.** Other recent advancements include systems that do not require docking stations (so-called “stationless” systems) and electric-assist bikes, neither of which have been proven at a city-wide scale. Several such systems are in pilot phases and are being prepared for future deployment. Both technology options will be explored as part of this study. The near future may bring a unified transit and bike share pass, of which a number of cities are very interested in implementing. Finally, operations have evolved from volunteer-led and informal, to sophisticated and formal, with significant investments in aspects from deployment to rebalancing (i.e. moving bikes from full to empty stations), customer service, marketing and maintenance.

Figure 2: Historic Development of Bike Sharing Technology





Figure 3: Elements of a 4<sup>th</sup> Generation Station-Based Bike Share System



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 travelled, calories burned, etc.

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 system infrastructure.

Figure 4: Elements of a 4<sup>th</sup> Generation Stationless Bike Share System



Bike share bicycle

Digital screen to receive unlocking code

keypad to insert unlocking code or other information

simple inverted U bike racks mounted on rails

photo source - <http://ladeetravels.blogspot.com/>

Rigid bike lock intended to be taken with the bicycle for subsequent use at other parking hubs or to standard city bike racks (the latter, typically for a small additional fee)



# Benefits of Bike Share

Bike share has been transformative for many cities. This section provides a summary of some of the financial, health, transportation and safety benefits that can go along with bike share.

## Financial Benefits

Bike share is a relatively inexpensive and quick to implement urban transportation option compared to other transportation modes. As shown in Figure 5, **the relative cost of launching a bike share system is several orders of magnitude less than investments in other transport infrastructure, such as public transit and highways.**

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

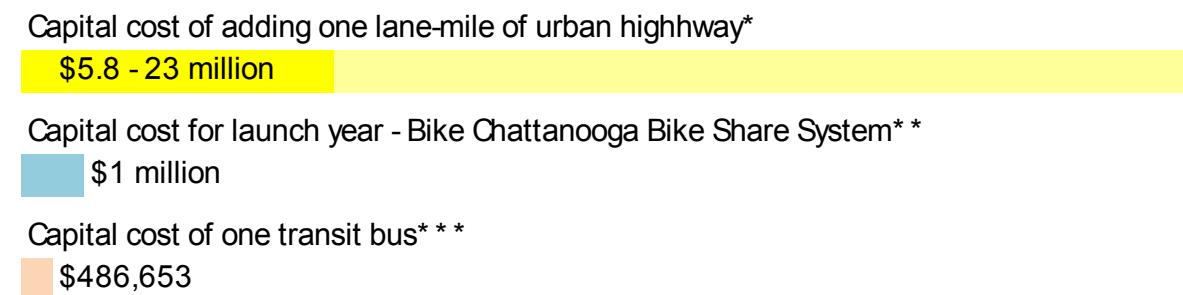
Currently, there is a spectrum of funding that includes public funding, grants, sponsorship, advertising, user revenues, and developer investment. Some cities use various funds to invest in both the up-front capital costs and pay for the on-going operations.

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 sponsorship and user fees with no government funding. Another example is DecoBike in Miami Beach, which was set up by a private vendor who funded the full capital costs and deployment. 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 funds to invest in the up-front capital costs and launch fees. On-going operations are funded through user fees and local funds. (Note that Capital Bikeshare will soon be venturing into the sponsorship realm as well.)

**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 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 get the ball rolling, and have brought in sponsors and advertisers later. Two of the older systems—Nice Ride in Minneapolis and Denver B-Cycle—benefitted from initial foundation support, and 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.

Figure 5: Relative Cost of Transportation Investments



\*Source: Rails to Trails Conservancy. Fact Sheet.

<http://www.railstotrails.org/resources/documents/whatwedo/policy/07-29-2008%20Generic%20Response%20to%20Cost%20per%20Lane%20Mile%20for%20widening%20and%20new%20construction.pdf> (accessed May 2014).

\*\*Source: Cliff Hightower, 2013. Chattanooga's bike share program must pull its own weight.

<http://timesfreepress.com/news/2013/jun/29/bike-share-must-pull-its-own-weight/?local> (accessed May 2014).

\*\*\*Source: American Public Transportation Association. Table 22: U.S. Average New Vehicle Costs for 2012 and 2013 Vehicles by Type.

[http://www.apta.com/resources/statistics/Documents/table22\\_vehcosttransitlength2013.pdf](http://www.apta.com/resources/statistics/Documents/table22_vehcosttransitlength2013.pdf) (accessed May 2014).



**Bike share systems in the U.S. have performed well in terms of “farebox recovery”,** meaning the percentage of operating cost recovered by user revenues. Figure 6 below compares bike share farebox recovery to traditional transit services. The average farebox recovery for U.S. metro transit systems is 38%. **Locally, average farebox recovery of the Central Midlands Regional Transit Authority (COMET) system is 31%, and state-wide average farebox recovery is roughly 34.1% in South Carolina.** Bike share farebox recovery ranges from close to 100% (Capital Bikeshare in Washington DC and Hubway in Greater Boston) to lower amounts such as 39% in Boulder, CO and 15% in Chattanooga, TN. Part of the reason for Capital Bikeshare’s high rate is the tremendous number of tourists who purchase one-day passes and pay overtime fees.

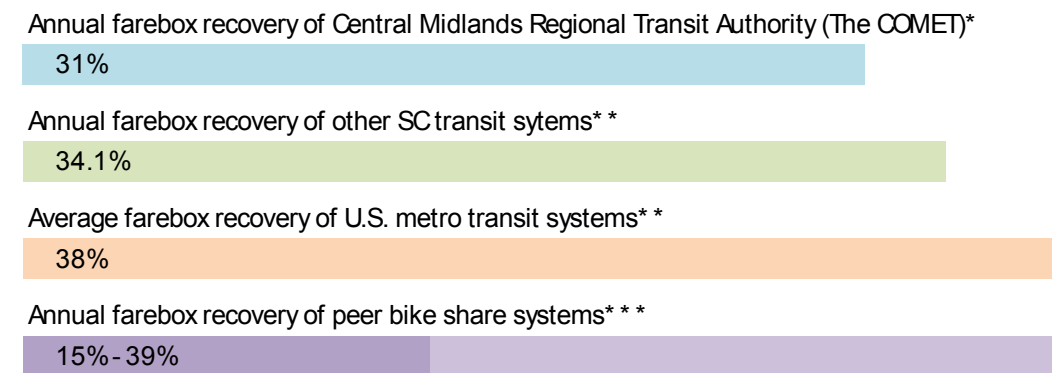
Where user fees do not cover the cost of operating the system, cities have used sponsorship or public funding to cover the full cost of operations. It should be noted that most bike share systems are very young—less than two years old—and it is too soon to truly understand farebox recovery (or other financial sustainability issues).

Many 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 US’s most prominent 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 visitors and tourists. They can also generate positive national and international media exposure that would otherwise be difficult or costly to generate. (For example, bike share helps to make Chattanooga one of the top 10 downtowns in the US, according to Livability.com)
- **Job creation.** On-going positions for managing and operating the system provide a benefit to the local economy. Table 1 shows jobs created from bike share systems in a handful of cities with bike share programs.
- **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 2013 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 could be provided for sponsorship. It can also be provided by companies

Figure 6: Comparison of Farebox Recovery: Transit vs Bike Share



\*Source: South Carolina Department of Transportation. State Fiscal Year 2012-2013 Public Transit Performance Report. [http://www.dot.state.sc.us/getting/pdfs/public\\_transit/sfy2013\\_annualtransittrends.pdf](http://www.dot.state.sc.us/getting/pdfs/public_transit/sfy2013_annualtransittrends.pdf) (accessed May 2014).

\*\*Source: American Public Transportation Association. 2012 NTD Data Table 26: Fare per Passenger and Recovery Ratio. <http://www.apta.com/resources/statistics/Pages/NTDDataTables.aspx> (accessed May 2014).

\*\*\*Sources for range of peer systems:

1) BoulderB-Cycle. 2013 Annual Report.

<https://boulder.bicycle.com/LinkClick.aspx?fileticket=AyhiVuJAAf1%3d%26tabid=1104> (accessed May 2014); and

2) Cliff Hightower, 2013. Chattanooga's bike share program must pull its own weight.

<http://timesfreepress.com/news/2013/jun/29/bike-share-must-pull-its-own-weight/?local> (accessed May 2014).



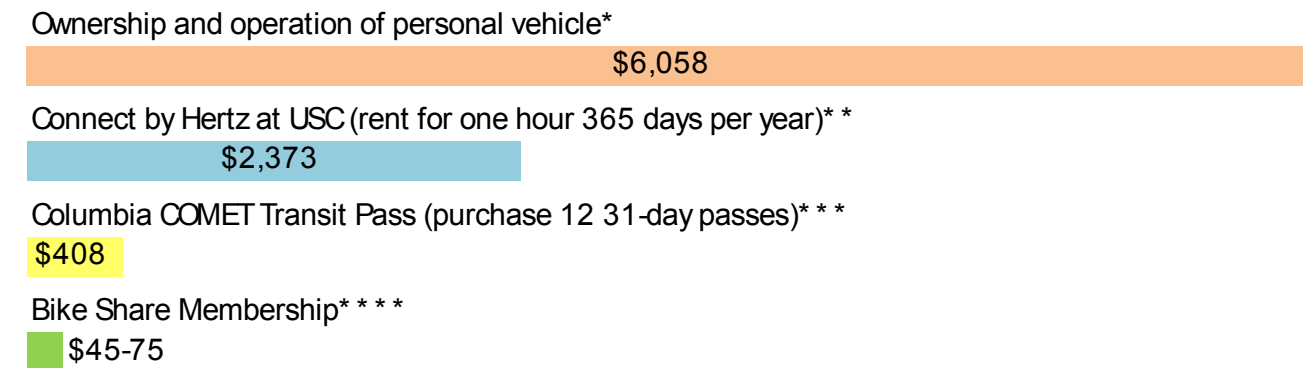
and property developers as a positive community amenity for employees or tenants.

- **Reduced transportation costs for household budgets.** For some households, bike share can help 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 \$45 and \$75 per year for similar cities, compared to \$6,000 for annual ownership and operation of a personal vehicle or \$408 for an annual COMET transit pass. Figure 7 compares the annual user costs for various transportation modes available in Columbia.

Transportation costs can be a significant part of household expenses. Any savings in travel costs can have a significant impact on people's ability to pay for other living expenses. According to the Bureau of Labor Statistics Consumer Expenditure Survey, residents in the Southern U.S. spent an estimated 19% of their household budget on transportation in 2012. The lower cost to use bike share compared to other transportation modes in Columbia could significantly reduce the amount a household spends on transportation. For example, **according to Capital Bikeshare's 2013 annual survey, members estimated an average savings of \$800 per year on household transportation cost because of bike share.**

Figure 7: Annual User Cost for Various Transportation Modes



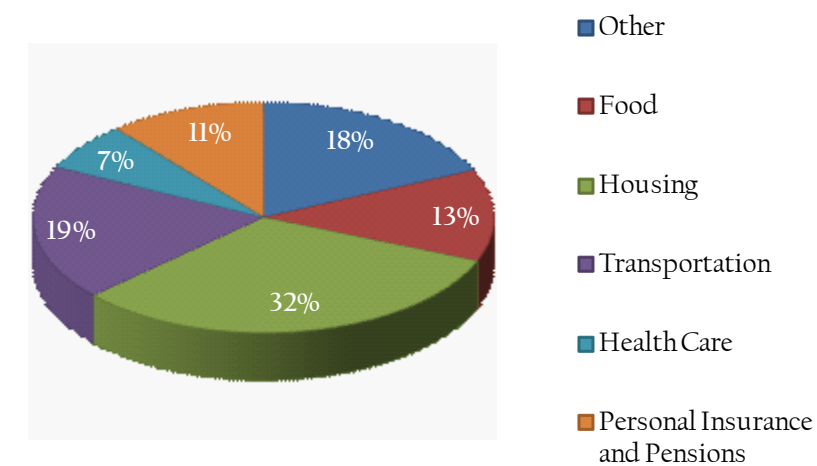
\*Source: U.S. Department of Transportation Research and Innovative Technology Administration, Bureau of Transportation Statistics. Average Cost of Owning and Operating a Vehicle Assuming 15,000 Vehicle Miles per Year.

\*\*Source: University of South Carolina Vehicle Management and Parking Services. Hertz on Demand. <http://www.sc.edu/vmps/connect.html>. (accessed May 2014).

\*\*\*Source: The COMET. Buy Passes. <http://catchthecomet.org/buy-passes/> (accessed May 2014).

\*\*\*\*Source: range for similar cities (Boulder, CO; Broward County, FL; Chattanooga, TN; Des Moines, Iowa) per the bike share system's websites.

Figure 8: Household Spending on Transportation in Southern Region of U.S.\*



\*Source: Bureau of Labor Statistics. Consumer Expenditure Survey, 2012. <http://www.bls.gov/cex/2012/combined/region.pdf> (accessed May 2014).



## 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 locally is being propelled by a number of agency and community initiatives, such as:

- Eat Smart Move More Richland County
- Healthy Columbia's Step Forward Columbia (walking program) and the Healthy Richland Initiative
- Palmetto Health's 29203 LiveWell Columbia Community Assessment and Healthy Palmetto program
- Carolina Cyclers promotion of biking and biking-related activities
- Girls on the Run of Columbia running programs that empower girls from 3rd to 8th grade for a lifetime of healthy living
- City of Columbia's Bicycle and Pedestrian Advisory Committee, which encourages active transportation and leads numerous annual community events to promote walking and biking

In South Carolina, levels of obesity and physical inactivity are both significant public health issues. As of 2012, South Carolina has the seventh highest rate of obesity levels *per capita* in the country (Figure 9). The Centers for Disease Control reported that in 2010, 31.5% of adults in South Carolina were obese, and an even higher number, 66.9%, were overweight.<sup>1</sup>

The same survey report also noted that 21.3% of adults in South Carolina responded that they did not participate in at least 60 minutes of physical activity on any day during the seven days prior to the survey, and only 17.1% were physically active for at least 60 minutes per day on each of the seven days prior to the survey. Additionally, 26.2% of South Carolina adults surveyed reported that, during the past month, they had not participated in any physical activity.

The Robert Wood Johnson Foundation's *County Health Rankings and Roadmaps* report lists Richland County as having 31% of its adult population as obese and 25% identified as physically inactive.<sup>2</sup> 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 min trip can help people get this needed physical activity as part of their daily commute or travel pattern.**

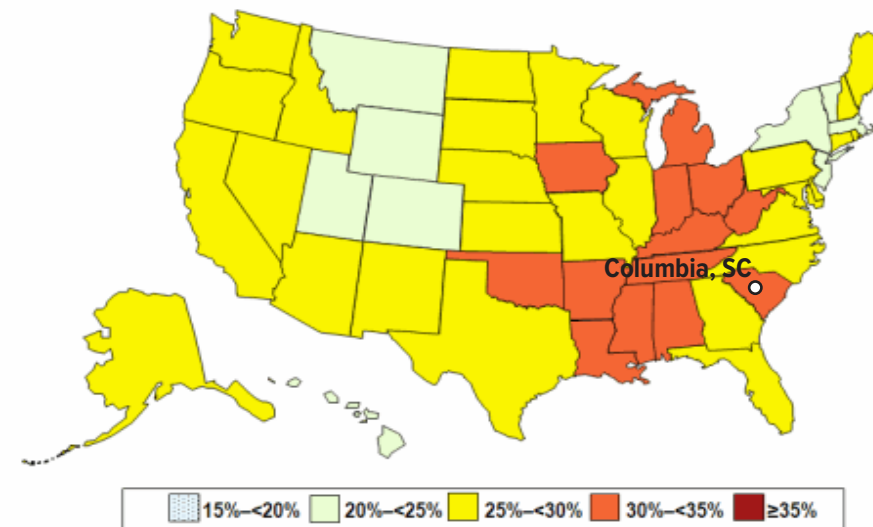
In addition to personal health, several health care providers have recognized the benefits of bike share. Health care providers such as Kaiser Permanente, Blue Cross

1 Source: <http://www.cdc.gov/obesity/stateprograms/fundedstates/pdf/south-carolina-state-profile.pdf>

2 Source: <http://www.countyhealthrankings.org/app/south-carolina/2014/rankings/richland/county/outcomes/overall/snapshot>

Blue Shield and Humana have provided sponsorship or other financial support for bike share systems. Some example systems include 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.

Figure 9: 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> (accessed May 2014).



## Transportation/Mobility Benefits

Bike share provides additional transportation options for short urban trips for residents and visitors. Figure 10 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.

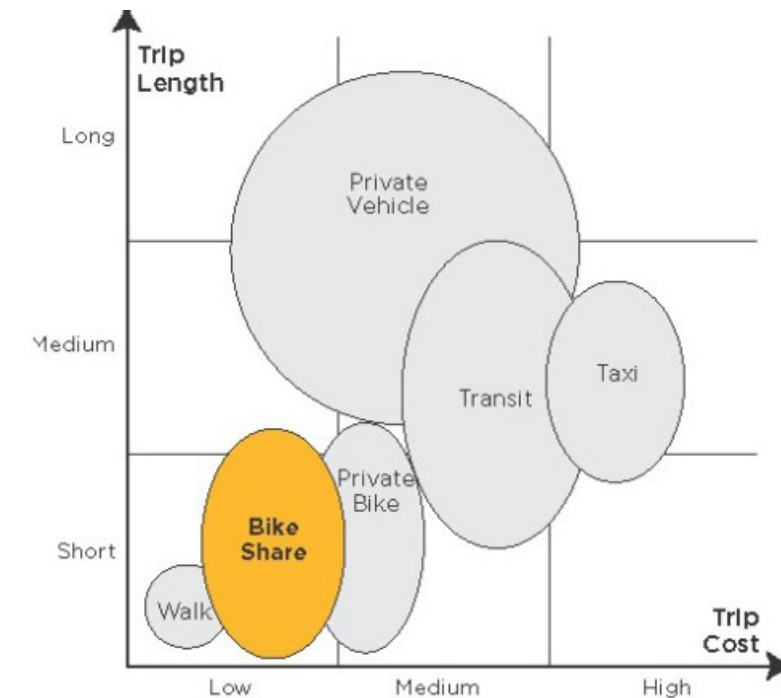
Bike share can also:

- **Reduce reliance on private automobile.** Initial experience in North American cities has shown that between 5%-25% of bike share trips replace a motor vehicle trip.
- **Extend the reach of transit** by providing a first and last-mile transportation solution, providing service to under-served areas or areas that do not justify the cost of other transit options.
- **Encourage more bicycling.** Approximately 66% of surveyed users in Minneapolis (2010) and 82% in Washington DC (2011) stated that they bicycle more since subscribing to bike share.
- **Introduce people to cycling that do not typically ride.** The 2010 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 and 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.

The state of South Carolina ranks 39th in commuter bicycling and walking levels, 48<sup>th</sup> in per capita spending on bicycle/pedestrian projects, and 47th in bicyclist/pedestrian fatality rates<sup>3</sup>. In South Carolina, 0.3% of commuters bike to work, and roughly 2% walk to work.

In Columbia, walking is above the national average. However, bicycling commute rates are below the national average. **Bike share can help increase cycling rates to work by providing walkers with an alternative non-motorized option and also expand the geographic coverage for transit riders.** With the right planning and promotion, it 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.

Figure 10: Urban Trip Modes



3 2014 Benchmarking Report: Bicycling and Walking in the United States, published by the Alliance for Biking & Walking.



Table 1: Walking, Biking and Transit commute rates in the US, South Carolina and Columbia

Commute	U.S.	South Carolina	Columbia
Car, truck, or van:	86.1%	92.0%	79.3%
Public transportation (excluding taxicab):	5.0%	0.5%	2.3%
Bicycle	0.6%	0.3%	0.4%
Walked	2.8%	2.0%	4.5%
Taxicab, motorcycle, or other means	1.2%	1.4%	2.0%
Worked at home	4.3%	3.7%	9.6%

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

## Safety Benefits

Bike share systems have to date observed a solid safety record. **In North American systems, few serious injuries and only one fatality have been reported out of more than 20 million trips and over 20 million miles traveled.** 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. As of April 2014, Citi Bike in New York City has had over 8 million trips without a single fatality and less than 40 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 (Figure 11).





Figure 11: Safety and other Features of a Typical Bike Share Bicycle (DecoBike, Miami Beach)





## Bike Share System Case Studies

Many cities in North America are investing in bike share systems for the reasons outlined previously. Their success in these cities has dramatically increased the visibility of bicycling and increased activity and investment in bicycling. Bike share systems in North America are diverse and include different generations of technology, varying fee structures, funding strategies and operational models.

To provide a snap shot of how peer cities have approached bike share, several case studies have been compiled. Below is a short overview of each of these systems with more detail on subsequent pages.

- **Des Moines B-Cycle:** a 6 station / 35 bike system operated by the Des Moines Bicycle Collective, an existing nonprofit organization. The equipment for this program is provided by B-Cycle, a partnership of Humana, Trek Bicycle Corporation, and Crispin Porter + Bogusky, who have also provided equipment for systems in Denver, Colorado, Madison, Wisconsin, and a number of other cities. Des Moines B-Cycle was the fourth bike share system in the U.S.
- **Bike Chattanooga Bicycle Transit System:** a 33 station / 300 bike system owned by Outdoor Chattanooga and operated by Alta Bicycle Share. The system launched in summer 2012.
- **Columbus CoGo Bike Share:** a 30 station / 300 bike system owned by the City of Columbus and operated by Alta Bicycle Share. The system launched in July 2013.
- **Madison B-Cycle:** a 39 station / 350 bike system that is managed via a public-private partnership with the City of Madison and Trek Bicycle. The system has expanded from the original 6 station / 60 bike system that launched in 2011.
- **Hamilton ON SoBi Bike Share:** a hybrid station-based, smart-bike system with 750 bikes and 105 stations anticipated to open in Hamilton, Ontario in spring of 2015.

These systems include a diverse mix of primarily station-based, 4<sup>th</sup> generation bike share systems, supplied by various equipment vendors. The system in Hamilton has yet to become operational and is due to launch in spring of 2015. The Hamilton system was chosen to highlight one of the only city-wide applications of a quasi-stationless, “smart lock” system that does not rely on relatively-expensive docking units. Instead the Hamilton system uses pricing to encourage users to park their SoBi bikes at hubs spread throughout the city. Although untested at a city-wide scale, the quasi-stationless system offers the potential benefit of lower capital costs and the ability to park and retrieve a bike anywhere in the service area.



## Des Moines, IA B-Cycle

### Launch Date

2010

### Size

Current: 35 bikes / 6 stations

At launch: 18 bikes / 4 stations

### Population

207,510 (2013 estimate)

### Funding

Sponsorship

### Management

Existing Non-profit (Des Moines Bike Collective)

### Cost

Memberships:

\$50 annual membership (\$40 for student/senior)

\$30 30-day membership (\$20 for student/senior)

Casual users: \$6 24-hr pass

All users: 1<sup>st</sup> hour included, \$2.50/additional 30-min. \$65 max per day

### 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)



Image Credit: Omaha Bikes web site



# Chattanooga, TN – Chattanooga Bicycle Transit System

## Launch Date

2012

## Size

Current: 300 bikes / 33 stations

At launch: 300 bikes / 30 stations

## Population

173,366 (2013 estimate)

## Funding

Federal grant (\$2 million CMAQ) and private foundation support (\$0.2 million)

## Management

Public-private partnership (owned by City of Chattanooga and operated by Alta Bicycle Share)

## Cost

Memberships:

- \$75 annual membership

- \$20 conference membership

- Tiered pricing for corporate & community partner member company employees (from \$0 to \$60 contribution by employee and \$50 to \$12.50 for organization, or 1x fee of \$100 by org)

Casual users: \$6 24-hour pass

All users: unlimited <60 minute trips during length of membership

## Access

Annual members unlock with a physical, unique Bike Chattanooga key (mailed to them once sign up) dipped into the slot at the docking point

Casual users pay for a 24-hr pass at the kiosk and are provided with a 5-digit code to unlock the bike.



Image credit: Chattanooga Bike Share web site



## Columbus, OH – CoGo Bike Share

### Launch Date

July 2013

### Size

300 bikes / 30 stations

### Population

822,553 (2013 estimate)

### Funding

\$2.3 m public investment in city's capital budget; \$1.25 m from Medical Mutual for 5-years of Operations

### Management

Public-private partnership (owned by City of Columbus and operated by Alta Bicycle Share)

### Cost

Memberships: \$75 annual

Casual users: \$6 24-hour pass

All users: first 30-min free, \$3/additional 30-min (\$1,200 lost bicycle fee)

### Access

Member: pay online and provided key to unlock bike from dock.

Casual: pay at kiosk using credit/debit card and receive code to unlock bike; receive a new code for subsequent trips by reswiping card in kiosk.



Image Credit: CoGo Bike Share web site



## Madison, WI B-Cycle

### Launch Date

2011

### Size

Current: 350 bikes / 39 stations

At launch: 60 bikes / 6 stations

### Population

243,344 (2013 estimate)

### Funding

Private funding and sponsorships

### Management

Public-private partnership (City of Madison and Trek Bicycle)

### Cost

Memberships:

\$65 annual (\$20 for University of Wisconsin-Madison students, faculty, and staff; \$45 for students elsewhere)

\$7.99 monthly (auto-renewing)

Casual users: \$5 24-hour

All users: first 30-min free, \$2/31-60 min, \$5/additional 30-min (\$75 daily max)

### Access

Members use B-card to unlock bike directly from dock OR can use same credit card used to purchase membership at the kiosk to unlock a bike

24-hour casual users can also purchase from kiosks.



Image Credit: Alta



## Hamilton, Ontario SoBi (Social Bicycles)

### Launch Date

Spring 2015 (anticipated)

### Size

750 bikes / 105 stations

### Population

504,000

### Funding

MetroLinx “Quick Wins” funds from Ontario Provincial Government

### Management

Owned and operated by SoBi Hamilton non-profit

### Cost

Memberships:

\$85 annual (\$70 for McMaster University students)

\$15 monthly

Casual users: \$6 per hour of use

All users: 60 minutes/day of “free” use; \$3 fee to park a bike outside of the established hubs

### 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.



Image of anticipated Hamilton SoBi station



# Program Goals and Interest in Bike Share

The goals of Columbia’s bike share program have been developed through a collaborative public process. The goals will help city/regional leaders and key stakeholders **measure success** and help **raise funds** necessary for capital, deployment and operations. 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

While all are legitimate performance measures, those used for a potential Columbia system will be finalized through the public-engagement process and through meetings and interviews with key stakeholders and city leaders.

**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 Columbia 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 Columbia’s visitors or USC sports fans could bring in sponsorship dollars through key stakeholders in the 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 downtown Columbia and USC with stations at key destinations for visitors. (It is important to note that visitors or tourists purchasing 24-hour passes typically bring in far more revenue than 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.

For the Columbia Bike Share Study effort, the planning team considered a variety of system goals including:

- Enhance the public transit network
- Increase the number and safety of bicyclists on the street
- Use bike share to leverage more bike infrastructure
- Improve Columbia’s image and attract new residents and businesses
- Improve air quality, while reducing motor vehicle traffic and congestion
- Increase physical activity to benefit public health
- Promote travel to landmarks, parks, trails and shopping districts (among residents and visitors)
- Increase access to job opportunities and education
- Expand mobility options for low-income residents
- Improve connectivity between existing hubs of activity (such as campus, the Vista, and Five Points)

To prioritize the goals and help inform the recommendations for the subsequent System Plan and Business Plan, opinions are being sought from the City of Columbia, Richland County, USC and key institutional and business stakeholders, community leaders and residents of Columbia and the region. An initial on-line survey was distributed to stakeholders and was accessible to the public during the 2014 summer. The survey asked respondents:

- Have you used bike share elsewhere?
- Are you interested in bike share for Columbia?
- How much would you pay for an annual membership?

General Location Suggestions	Top Suggestions through the Online Map
Downtown	Riverfront Park
USC	Richland County Public Library
State house	Aspyre and Olympia & Granby Mills
Five Points	River Walk Amphitheater
Decker Mall	Rosewood corridor
3 Rivers Greenway	Williams-Bryce Stadium and tailgate lot
Stations connecting from the greenway trails to the Vista	River Rat Brewery
Libraries	Main and Hampton Pinehurst Park
Government Services	Elmwood Park





After the on-line survey was officially closed at the end of August, over 800 were received and processed. Additionally, the project team provided information about bike share and sought input at a series of public workshops. Bike share was also a topic at the eight focus group meetings held in June 2014. A summary of the combined public input related to bike share is explained below.

## Summary of Stakeholder and Public Outreach

A majority of **public outreach responses support the concept of bike share** in Columbia. Concerns regarding the distance between destinations in Columbia and the low levels of bicycling for transportation that currently exist were expressed in terms of potential bike share usage. For a local bike share program to be deemed successful, citizens and stakeholders identified the following as the primary outcomes:

- Improve transportation options and access to healthy living and active transportation.
- Reduce the number of cars on the road.
- Reduce the number of car trips and vehicle miles traveled in private vehicles

While these specific outcomes can be difficult to measure in terms of causality, they do provide helpful insight related to system planning strategies. **These goals reflect the need to seamlessly integrate bike share infrastructure within the multi-modal transportation network, including transit and car-sharing services, and to location stations in a manner that supports day-to-day travel for local residents in addition to tourist- and leisure-based travel.**

The community sees the greatest potential for bike share usage around the colleges and universities, Five Points, downtown, the greenways, and the Vista Business District. Public meeting participants and users of the online mapping tool also developed a list of the places in Columbia that, if a bike share system is developed, should have a bike share station and be included in the bike share network. Online users suggested a total of 33 potential station locations. The top ranked suggestions are included below, along with locations identified in the broader public outreach.

The focus groups identified a wide range of potential bike share operators and partners who could help to fund and manage a bike share system for Columbia. The following agencies and organizations were named as potential operators:

- City of Columbia
- USC
- City/County partnership
- USC/City/County partnership
- Transit
- Private operator
- Library system

Lastly, focus group participants discussed ideas for bike share membership and pricing schemes. One idea posed is to have an annual membership fee with a tiered pricing structure for bike use depending on how long a bike is checked out. Some participants identified the potential to include the bike share fee within the student fee at local colleges and universities, which would encourage students to use the system. The fee could be priced and included in student fees similar to the way a student meal plan or a parking pass is priced.



## Local Context Analysis

Assessing the opportunities and challenges of implementing a potential bike share system in Columbia requires an analysis of the local community's character and built environment, as well as direct comparisons to relevant cities that have implemented bike share.

**Columbia has some of the characteristics traditionally thought to support bike sharing**, including:

- a compact and walkable business district;
- a job-rich central business district;
- neighborhoods with moderate or high density housing;
- active eating/drinking/shopping areas; and
- various cultural or sporting destinations that draw both residents and visitors alike.

Based on bike share industry experience, there are a number of factors that are considered for a successful system. Under-performance in any one of these areas does not exclude the feasibility of a bike share system, but each factor influences the potential success of the system.

**Notably, Columbia features well-supported visitor attractions, institutional and political support for bike share, a compact and active downtown and State House area and a large university with over 32,000 students.** In recent years, there have been on-going revitalization efforts in the downtown area. The Congaree Vista district is now a thriving area with restaurants, art galleries, and shops. More recently, efforts have been focused on Main Street to re-establish it as a residential and commercial corridor. Columbia is also considered a Bike Friendly Community by the League of American Bicyclists and aspires to expand their existing network of bicycling infrastructure and greenways. The current master planning effort indicates the City's commitment to becoming more bicycle friendly.

However, there are also a number of **challenges to developing a successfully bike share program** in Columbia. This includes:

- Large sections of the city with low residential density
- Few other large business districts outside of downtown
- Currently, a low level of bicycle use and limited (but growing) bicycle infrastructure
- Traditionally automobile-dominated transportation culture.

The last bullet, 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 already used to taking some of their trips by non-auto modes of transportation.

## Demographics

Bike share systems are most successful where there is a mix of land uses, modest or high density of homes and jobs, and where trip-making occurs throughout the day and night as well as on weekends. In Columbia, **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 (*a resident of Arsenal Hill wanting to get to his job near the State House, for instance*)
- Commuters travelling to the service area via transit or other transportation. (*Someone getting off at the COMET transit center downtown needing to quickly get to her job at Publix, for instance*). In this way the system can:
  - Offer a "last mile" option between home and transit or between the transit station and school, work, or other similar destinations
  - Extend the reach of transit into areas that are currently underserved by transit
- Students, faculty, and staff from USC, as well as Benedict College and Allen University (*two Benedict College students wanting to meet friends from USC at a Five Points pub, for instance*)
- Visitors and tourists accessing sports, entertainment, hotels, and cultural attractions (*a businesswoman needing to get from her hotel on Main Street to a meeting at USC, for instance*)
- Residents or visitors looking to go for a relatively-short recreational ride within the city or along the Three Rivers Greenway (*a couple visiting from Spartanburg who visit the State Museum and want to bike up and down the river greenway for an hour before heading to a restaurant in the Vista District, for instance*).

The face of bike share is constantly changing. Many US 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 US 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 Columbus, OH; Madison, WI; Louisville, KY; and Chattanooga, TN) are entering the bike share market. These systems are the first real test of the demographic limits of bike sharing. In many cases it is simply too early to gauge their success.

### Population

With a population of approximately 133,000 people in 2013, Columbia is the largest city in South Carolina, followed by Charleston which has approximately 128,000 people. Richland County’s 2013 population is just under 400,000 people. For comparison, Chattanooga, TN has a population around 173,000 and, in April 2012, launched one of the first bike share systems in the Southeast. Columbia’s city-wide population density is just under 1,000 persons per square mile, which is lower than many larger bike share cities but comparable to Chattanooga’s.

### Early Adopters

The impact of age and income on bike share usage is not clear. Thus far, other cities have found that certain 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. However, this may be related to a higher proportion of these populations living and working in the system’s service area.

For example, higher income households seem to take to bike share quickly. Approximately 46% of Capital Bike Share users in Washington DC and 39% of Minneapolis Nice Ride users reported household incomes over \$100,000.

**Populations aged 25 – 34 years old represent the largest group of bike**



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

**share users** (39% - 49% of bike share users compared to only 18% - 22% of the general population). The City of Columbia has either a similar or slightly lower percentage of residents aged 25-34 years old than other cities operating bike share. For comparison, the 25-34 year old age group in Chicago makes up 19.1% of the city’s population, while in Columbia it is 17.5%.

Understanding where people in this age demographic live and work within the City of Columbia and Richland County can help to 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 encourage high rates of early adoption.

### Employment

In the 2006-2010 American Community Survey, the City of Columbia had an estimated 140,946 workers, including 10,200 Armed Forces employees, and a daytime population of 205,764. The Columbia community is home to two military installations – Fort Jackson (the U.S. Army’s largest and most active initial entry training installation) and McEntire Joint National Guard Station.

Major employers will serve as important trip generators and attractors for the bike share program. Notably, Palmetto Health has 9,400 employees and the University of South Carolina has 4,500. Major employers will also be important corporate partners that could 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 residents’ access to jobs.

City	Bike Share System Name	2013 Population
Chattanooga, TN	Bike Chattanooga	173,366
Columbus, OH	CoGo Bike Share	822,553
Des Moines, IA	Des Moines B-Cycle	207,510
Madison, WI	Madison B-Cycle	243,344
Greater Phoenix, AZ	Grid Bike Share	2,139,182
Columbia, SC	N/A	133,358

City populations of Bike Share System Case Studies



The top employers for the City of Columbia are shown in the table below.<sup>4</sup>

Employer	Industry	# of Employees
Palmetto Health	Healthcare and Social Assistance	9,000
University of South Carolina	Higher Education	4,500
City of Columbia	City Government	2,586
Providence Hospital	Healthcare	1,800
Dorn VA Medical Hospital	Healthcare	1,457
Westinghouse Electric	Nuclear Fuel Assembly Manufacturing	1,200
Colonial Life Insurance Co.	Insurance	1,032

### Visitors

Columbia is known by its residents as “famously hot” and experiences year-round tourism. It is home to a mix of attractions including museums, historic homes, gardens, rivers, parks, colleges, shopping, and dining. The Riverbanks Zoo and Botanical Garden, University of South Carolina, Columbia Canal and Riverfront Park, and Statehouse are major attractions in Columbia. Three rivers meet in Columbia, with the Three Rivers Greenway linear park stretching nine and a half miles between Columbia, West Columbia, and Cayce providing outdoor recreation opportunities. In addition, nearby Lake Murray is another outdoor recreation spot.

Although not all these attractions are centrally located and thus may not be covered in the deployment of a potential bike sharing program, their indirect impact of drawing visitors to hotels, restaurants, and other attractions is significant. Currently, many visitors rely on vehicles – whether a personal vehicle, rental car, or taxis – to travel within Columbia. **Bike sharing could link to other transportation options (such as tour buses and COMET buses) that would allow visitors to avoid use of a car** and offer them the opportunity to experience Columbia at a slower pace by bicycle.



*The Statehouse is one of Columbia's top visitor attractions (image: Wikimedia Commons web site)*

<sup>4</sup> Source: Central SC. (2014). Retrieved from <http://www.columbiasc.net/depts/economic-development/docs/extprod020818.pdf>

## Policy Environment

The policy environment for bicycling in Columbia has improved significantly in the last five years. Current policy is supportive of bicycle and pedestrian safety, in terms of speed limits, prohibitions of bicycling on sidewalks in downtown, and similar measures. Biking and walking access to private student housing is being prioritized. Additionally, the City is currently updating its land use plan with a focus on strategically linking land use and transportation and supporting bike- and walk-friendly environments. An update to the City’s codes and ordinances will follow after the land use plan is updated and is also expected to establish a clear regulatory framework for supporting a multi-modal transportation system.

In 2010, Columbia passed a Complete Streets Resolution and in 2013, the City endorsed the national best practices for bicycle facility design found in the NACTO Urban Bikeway Design Guide. However, development requirements and City Street Design Standards do not match these advancements.

Bicyclists (children and adults) are not required to wear helmets by state or local law. This is an important distinction as cities and regions with mandatory helmet laws for adults have difficulty launching and/or sustaining a bike share system. 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 two abreast in the roadway and the laws do not prohibit bicycling on sidewalks, except in areas where local ordinance prohibits it. The latter is true for Columbia’s Central Business District.

## Physical Characteristics

The City of Columbia is located where three rivers converge –Saluda River, Congaree River, and Broad River – and covers approximately 132 square miles. Richland County is approximately 760 square miles. Both city and county are generally flat with some gentle undulations. The City’s relatively flat terrain will positively contribute to demand for bike sharing. One particular challenge however is the relatively steep hill between some parts of the USC campus and the Five Points neighborhood.

### Density and Opportunities and Challenges

Columbia’s population density is 988 persons per square mile (though without Fort Jackson’s land area included, the density would be significantly higher). Compared with many other peer bike share cities in the Southeast and Mid-West, this is quite low. The population density of Chattanooga is 1,222 people per square mile, Des Moines is 2,515, Charlotte is 2,663 and Columbus OH is



3,624. Densities of some of the busiest bike share systems in the US such as Washington DC, Chicago and Boston exceed ten thousand people per square mile. However, while this data is notable, it does not tell the entire story. A number of medium and small city bike share systems are concentrated almost exclusively in the downtown area. **Despite the relatively low residential and employment density outside of downtown Columbia, the core of the city could potentially host a station-based (or non-station-based) bike share system that could prove to be successful.**

To better understand the possibilities for bike share in Columbia from a qualitative perspective, the following opportunities and challenges for various districts in the city are highlighted.

### *Metro Columbia and Environs*

#### Opportunities

- Introduction of bike share has reached a number of mid-size and small cities in the Southeast including Greenville (6 stations, soon to expand to 8), Spartanburg (4 stations, soon to expand to 5), Charlotte (25 stations) and Chattanooga (30 stations)
- The State House, the USC campus, the state museum and some of the historic homes are **major regional and state-level attractions**
- A relatively flat topography in some sections, with **mild weather** for at least 8 months of the year
- One of the key destinations along the state-wide **Palmetto Trail** that continues to improve and expand
- A **Bronze-level bicycle friendly community** that is currently in the midst of a city-wide bicycle master planning effort

#### Challenges

- **Low residential and employment density** and few destinations outside of downtown
- **Lack of existing bicycle infrastructure** in many neighborhoods and business districts
- While bicycling for transportation is slowly increasing in inner Columbia, is not as common outside the downtown, USC campus area and Five Points neighborhood
- **Relatively easy and inexpensive automobile travel and parking** throughout the region (making alternatives more difficult to promote)
- The **arterial network creates gaps and dead zones** between active residential, entertainment, shopping and employment areas

### *Central Business District and State House Area*

#### Opportunities

- **Easily bikeable distances** within the core commercial business district
- Presence of **key visitor attractions**: State House, Convention Center, Main Street shopping, Columbia Museum of Art, City Hall, COMET transit center, Richland Township Auditorium and the Historic House Museums
- **High concentration of jobs** in private and public sectors (state employees)
- **Cluster of hotels** house visitors who may want to use a bike for a short trip

rather than drive

#### Challenges

- Lack of existing bicycle infrastructure
- Some **physical constraints** in terms of siting stations (busy roadways and/or narrow sidewalks in places)
- **Roadway width and traffic levels** along Assembly Street creates a modest barrier to bicycle connection to the Congaree-Vista District
- Some steep hills
- Lack of concentrated land use creates a gap between activity along Main Street and the Benedict College/Allen University area

### *University of South Carolina campus and Five Points*

#### Opportunities

- Home of the University of South Carolina with **over 32,000 students** (and thousands of employees), an ideal demographic of bike share users
- Significant **on-campus residential density**
- An established area of bicycling activity with **bike lanes and shared lane markings** on some streets
- **New student housing** “hub” on Main Street is beyond ten minute walk for some students
- **High demand** to connect with shops, cafes and bars in Five Points, an area where parking can sometimes be limited
- Five Points is **beyond convenient walking distance** from Benedict College or Allen University

#### Challenges

- Some of the streets that provide connections from nearby activity areas to Five Points are busy and **less-than-ideal for beginner or intermediate bicyclists** (eg. Harden Street)
- **Significant slope** between USC campus and Five Points could limit connections between these two major destinations
- **USC campus is compact** enough that demand for bike share within campus may be limited.



### Congaree-Vista District

#### Opportunities

- Has evolved into a **major destination** for shopping, eating and drinking that could draw both residents and visitors to come by bike
- Includes **significant destinations** such as the South Carolina State Museum, Publix Market and the Richland County Public Library
- Home to the **ongoing greenway trail project** through Finlay Park and the Three Rivers Greenway
- **Very close proximity to Main Street, the State House area and many hotels**

#### Challenges

- Width and traffic levels along Assembly Street and Huger Street creates a **modest barrier to bicycle connection** to Main Street and to the river, respectively
- **Lack of on-street bicycle infrastructure**

### Columbia's North Side

#### Opportunities

- Palmetto Health Richland Hospital is a **major job center and destination**
- **1200 students** at Columbia College

#### Challenges

- The various **low-density residential neighborhoods and few concentrated job areas** make it difficult to sustain bike share
  - Connectivity to downtown **requires bicycling on busy roadways** such as Main Street and Bull Street, which lack a dedicated bicycle facility
- 

### Columbia's East Side and Fort Jackson

#### Opportunities

- **Fort Jackson** could offer an opportunity for bike share system within the Base
- **16,000 students** at Midlands Technical College
- **Rosewood Business District**, anchored by Publix, could be a destination for bike share

#### Challenges

- The various **low-density residential neighborhoods and few concentrated job areas** make it difficult to sustain bike share
- Connectivity to Five Points and USC **area requires bicycling on busy roadways** such as Devine or Millwood Avenue which lack a dedicated bicycle facility

### West Columbia and Cayce

#### Opportunities

- Sidewalks and bike lanes along the Gervais and Blossom Street bridges provide a **good connection across the river**
- **Restaurants, cafes and taverns on State Street**
- **Three Rivers Greenway** on the west bank of the river

#### Challenges

- Many streets in the area are **very car oriented** and not especially friendly to bicyclists
  - The various **low-density residential neighborhoods and few concentrated job areas** make it difficult to sustain bike share
-



## 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 subway station. 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, however, that most cities that take advantage of this synergy feature a subway or light rail transit system, supplemented by buses (eg: Washington DC, Boston, Chicago, Charlotte, etc.). In smaller cities that do not have rail transit, there are limited opportunities to co-locate bike share stations with transit. Rail transit stations are less frequent and spaced farther apart and therefore 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 exploit the multi-modal synergies between bike share and transit.

In Columbia, the regional transit agency, Central Midlands Regional Transit Authority (CMRTA), a.k.a. the COMET, transports riders throughout Columbia, Cayce, West Columbia, Forest Acres, Arcadia Lakes, Springdale, and the St. Andrews area. The COMET system connects the Columbia region via 18 different routes across all three rivers, extending in all directions from downtown. However, the bus routes to West Columbia and to Cayce only have weekday service. Many of the COMET system’s bus lines converge downtown at the transit center at Laurel and Sumter Street. Giving bus riders an opportunity there to switch to bike share to complete their trip somewhere in the downtown area could be a mobility enhancements for thousands of riders.

The potential to enhance transit’s reach is also true for the USC campus transit service. USC transit offers six fixed routes throughout the downtown campus and connecting to Innovista. With multiple new in student housing developments underway in and around downtown, bike share could serve as a critical link between new student housing and campus transit. Additionally, it could provide a multi-modal trip option for students, faculty, or staff traveling from campus to areas within biking distance of a USC transit stop, but too far to bike from campus itself.

## Bike Network

The City of Columbia and Richland County have a limited but growing bikeway network. Throughout the region, community stakeholders recognize a lack of safe bicycling infrastructure. Yet the city has growing bicycling culture, characterized by thriving bike shops and a bicycle-based industry (such as Hawley), annual increases in the number of participants in Bike to Work Day, and the work of groups such as the City’s BPAC, Palmetto Cycling Coalition, and Palmetto Conservation Foundation. Due in part to these efforts, the City of Columbia was recognized as a bronze-level Bicycle Friendly Community by the League of American Bicyclists in 2008. As a

complement to this designation, Columbia is currently engaged in a Pedestrian and Bicycle Master Planning process.

Currently, the bikeway network in the City of Columbia includes:

- 19 miles of bike lanes
- 0.5 miles of sharrows
- 20 miles of bike routes
- 20 miles of paved shared use paths
- 30 miles of natural surface paths
- 25 miles of singletrack

Along Columbia’s three rivers, the Three Rivers Greenway is a nine and a half mile linear park extending through Columbia, West Columbia, and Cayce. In addition to lighted trails and boardwalks, the Three Rivers Greenway includes restrooms and outdoor amphitheaters for trail users. Currently, there are plans to extend the Greenway on the east bank of the river further south. This extension could provide pedestrian and bicycle connections to USC’s baseball and football stadiums.

There is limited information to suggest whether a dense network of bicycle infrastructure is required in order for bike sharing to be successful. For North American systems, it’s noted that **bike share systems have acted as a catalyst for increased investment in bicycle infrastructure.** This has happened in Washington DC and Boston 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 2011, respectively.

Although an extensive bikeway network may not be essential to the launch of a bike share system, **providing a core network of low-stress, intuitive bikeways that connect various neighborhoods will definitely promote the success of the system.** Low-to-medium cost infrastructure improvements that help deliver a core cycling network could be packaged together with the launch of bike sharing. This was the pattern in successful bike share cities such as Boston, Kansas City, Washington DC and Chicago. In other cities, such as Madison, WI and Minneapolis, a well-established bicycle network was already extant before bike share was launched.



## Climate

A particular city's climate can influence demand for a bike share program. Figure 12 and Figure 13 show average monthly temperature and rain fall in Columbia, respectively. In general, the region experiences warm to hot temperatures during summer months and mild to cool temperatures during the fall, spring and winter. Precipitation is moderate throughout the year with averages between 2.5 to 5.5 inches per month. For reference, the two figures below indicate the annual average monthly temperature and precipitation.

The **highest bike share demand months will likely occur during spring and fall months when the student population in Columbia is at its peak and visitors come to Columbia during weekends and holidays.** As in other cities, bike share demand will shrink on extremely hot days and during off-season months (as much to do with the reduction in visitor numbers as the weather). Some bike share systems shut down during winter months due to snowfall and icy conditions. However, these are mostly in the Northeast and Northern Midwest, including Minneapolis, Madison, Montreal and Boston. Considering winter temperatures are milder and, thus, snowfall is less prevalent in Columbia compared to those cities, **operations in Columbia could be year-round without a winter closure.**

Figure 12: Annual Average Monthly Temperatures – Columbia<sup>5</sup>

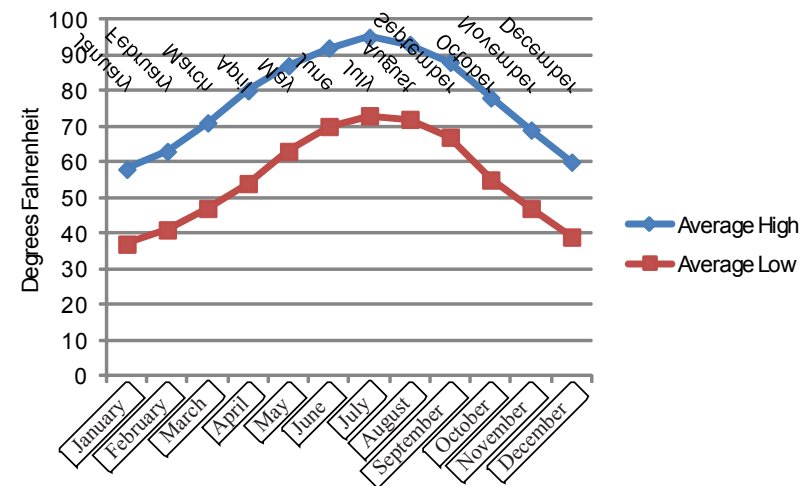
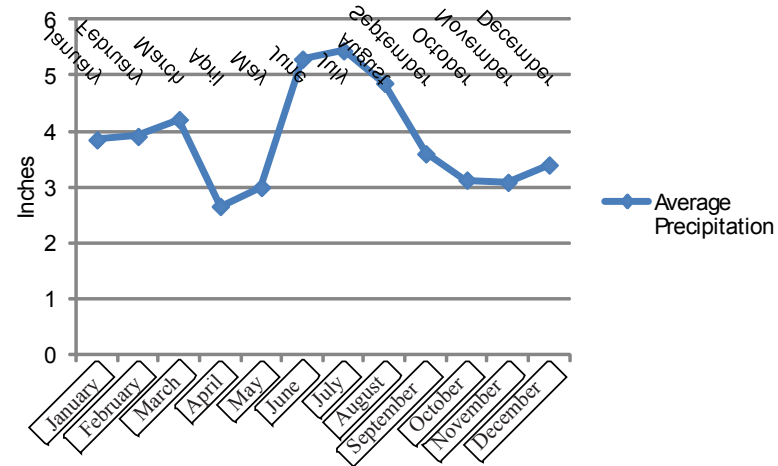


Figure 13: Annual Average Monthly Precipitation – Columbia



<sup>5</sup> Source: Weather.com





# Existing Conditions Analysis Conclusion

The City of Columbia contains a number of characteristics supportive of a successful bike share system. Key strengths of Columbia include:

- ✓ **Support from elected officials and recent policy changes** that have established momentum for bicycle infrastructure and initiatives
- ✓ **Ongoing redevelopment in the center city:** along the Main Street corridor, at the USC campus and in the Congaree-Vista District
- ✓ **Large college student population** and a healthy **percentage of residents aged 25 to 34** (the “early adopter” demographic in many cities)
- ✓ **Large concentration of jobs within the core** of downtown, the State House complex and at USC
- ✓ **Mild winters**
- ✓ **A well-used bus transit system** focused on downtown Columbia
- ✓ **A growing bikeway network**, both greenway trails and on-street facilities

There are, however, a handful of challenges that need to be both understood and addressed, to make a bike share program—whether station-based or non-station-based—feasible in Columbia. These include:

- There are **few areas with concentrations of jobs outside of downtown** and most are surrounded by residential areas too low in density to support bike share
- A city-wide network of **busy collector and arterial roads** that will make most potential bike share users uncomfortable (ongoing efforts to develop Complete Streets and bikeways will gradually change this condition however)
- **Parking lots and low-density development that create gaps** between active districts in the downtown area, eg. between the Main Street corridor and Benedict College/Allen University
- A handful of **streets with four or more lanes of traffic downtown** that are unfriendly to bicyclists, especially for beginner or intermediate cyclists that bike share systems typically rely on as a key base of users
- The relative **ease of driving and free/inexpensive parking** throughout the entire city, except a few discrete areas of downtown and the USC campus

These key challenges can be mitigated by improving bikeway connections between

districts. **Improved bikeway connections between the riverfront, the Vista District and the Main Street corridor is most critical.** Ongoing redevelopment will help to close the land use gaps, and new pedestrian and bicycle infrastructure in the area, will improve the environment for bike share significantly. A more bicycle-friendly environment downtown will be needed to encourage visitors, especially, to try out bike share as a way to get around and see the City’s many sights.

Many of the challenges to the feasibility of bike share are due to the limitations of Columbia itself: the fact that it’s a small city with a relatively compact and walkable downtown, but with most neighborhoods and business districts designed for car travel. This is not an unusual dilemma as most other cities in the South, and throughout the US, face similar challenges. Like most cities, Columbia exists within a car culture that is difficult to change. The reality is that nearly everyone who can afford a private vehicle has one and uses it for nearly every trip. The few exceptions might be walking to a neighborhood park, or to run an errand if one works downtown or on the USC campus. This limits the pool of potential users who may want to use bike share as an alternate to driving.

There is **some opportunity to leverage the latent demand for bike share** for those who do not have access to an automobile: low-income individuals or visitors staying in downtown’s hotels. Capturing ridership from either audience will be an important part of developing a potential bike share system. It will take a significant marketing campaign however, as both demographics are predisposed in our culture to take the bus or walk, or rent a car, or take a taxi, respectively. If interest in bike share can be successfully targeted to both of those communities, developing a bike share program in the core of the City will have a fighting chance for success.



# Bike Share Plan: System and Business Plan

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## Business Plan Overview

The remaining sections of the Bike Share Plan serve as business plan for the creation of a bike share system in the City of Columbia. The business plan builds upon the information shared in sections 1 through 6, which presented a history and background of bike sharing, an overview of the process used to develop the program goals, and an analysis of existing conditions. All of these are intended to build the case for whether, ultimately, a bike share network will be feasible in Columbia.

This draft Business Plan contains:

- A recommended service area, system size, and phasing strategy for strategic growth;
- A business model for administering and operating the system;
- A business *pro-forma* that explores the financial feasibility;
- Funding options for capital and operational expenses;
- Ridership and revenue projections based on the installation of the recommended bike share network; and
- Identification of next steps towards implementation.

The Business Plan is a planning document, and as such makes a number of assumptions. It will be the job of the bike share program administrator, in conjunction with the chosen equipment vendor and operator, to refine the assumptions as necessary.

The Business Plan is laid out as follows:

*Section 8* provides a summary of the system plan recommendations and estimated system performance.

*Section 9* presents planning considerations including a definition of the area to be covered by the initial phases of the program.

*Section 10* explores the various types of business models that have been adopted for bike sharing systems in the United States and outlines the potential governance structure options that will ultimately be recommended for Columbia.

*Section 11* describes the costs associated with establishing and operating the system, and *Section 4* outlines potential revenues, including those generated

by users and potential public and private funding.

*Section 12* includes a preliminary five-year financial *pro-forma* and presents a proposed funding plan.

*Section 13* explores operational characteristics that will need to be considered by the program administrator, the equipment vendor, and the operator.

*Section 14* outlines “best practices” in other bike share cities to plan and promote system equity.

## Business Plan Summary

This Chapter outlines a business plan for the creation of a bike share program in the City of Columbia. 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; identifies operational considerations for the program; and presents a series of best practices to ensure system equity.

The recommended system will consist of an initial launch (Phase 1) of 15 stations and 135 bikes at key locations downtown, near the USC campus, in Five Points and in the Congaree-Vista District. Phase 2 will densify the network with 10 additional stations, some within the initial service area and a handful of others beyond the core of the city. Ownership of the system will likely come from an existing or newly-formed non-profit who will provide operations or contract it out to a private vendor.

Station sites will ultimately include a mixture of sidewalk and on-street sites at an average spacing of approximately one station every ¼ mile. This density 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.

Phase 1 and 2 of the system is expected to cost \$3.4 - \$4.0 million over five years—depending on selected equipment and technology—including capital, launch, administration, and operating costs. Projected revenue of \$68,000 (year 1) to \$232,000 (year 5) per year will provide 21-43% of the operating fees, but will need to be defrayed by \$2.6 – \$3.2 million in gap



*In 2016-17, Columbia may have a bike share program*



funding over the five-year period. Gap funding will primarily come from two sources: federal grant funds and system and/or station sponsorship. For the latter, other cities' experience has shown that corporate sponsors like to have stations and/or bicycles branded with their logos and corporate color scheme, in some cases. As a local ordinance related to advertising within the public right of way currently stands, this would not be allowed. It is strongly recommended that the City of Columbia revisit this ordinance and, at the very least, add language that would provide an exception to corporate logos or advertising on bike share equipment.

Members will be able to access the system for a cost of \$75 for an annual membership, \$25 for a monthly membership, \$15 for a three-day pass, and \$6 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.

Given the importance of providing bike share for a diverse range of demographic groups in the region, it is recommended that the program incorporate some of the Equity best practices from Section 7. The affordability strategies and promotional programs, especially, will create another mobility option for communities needing enhanced transportation to jobs, shopping and destinations within the city core.

From inception to launch, a 15 station, 135 bike system will take 18-30 months to implement. Specific "next steps" that will need to be met before a potential 2016 or 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 Columbia;
- Seek partners in the public and private sector who can deliver on commitments to help;
- Form a Board of Directors, establish a non-profit and hire an Executive Director;
- Refine a fundraising strategy that includes grant applications and presentations to potential foundation, institutional or corporate sponsors (prior to this, the City Council must revisit the local ordinance prohibiting advertising or logos within the public right of way);
- Continue to aggressively implement new bikeway projects within the designated service area to promote access and safety for less-experienced riders;
- System plan approval & permitting from the City of Columbia and the State of South Carolina, as necessary for stations near the State House or on the USC campus;
- Develop an RFP for an equipment vendor—with a proven hardware track record and fully-functional software—and, potentially, an operations vendor

(can be combined or separate).

Of the time frame established above, the launch itself will take approximately six months and include:

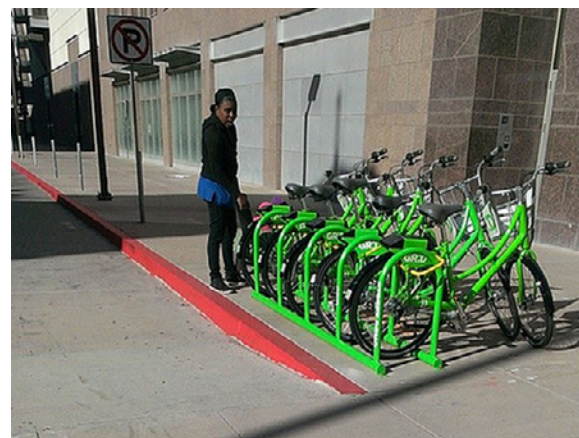
- Purchase equipment and lease warehouse and office space;
- Hire and train an administrative team;
- Maintain ongoing branding, marketing, and advocacy to promote wide interest in bike share;
- Design a website that provides essential information, along with specific tools—such as mobile applications, membership registration, and interactive maps—to enhance the user experience;
- Manufacture, delivery, assembly and installation of equipment;
- Creation of system name and logo;
- 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 Columbia has some of the key characteristics required to make a bike sharing program successful and has an opportunity to continue its development as a bike-friendly city. However, it is important to temper one's expectations about bike share in the city. The business plan's analysis shows that use will be modest in Columbia. One key metric for usage is the average number of times each bike will be used each day. Large cities with a dense network of stations (eg. Chicago or Boston) feature 4-5 daily trips per bike. Smaller cities with medium-sized networks such as Chattanooga's 300 bike program feature roughly one daily trip per bike. Projections for Columbia are for roughly 0.5 daily trips for bike during the first year, rising to 1.0 trip per day per bike after five years. While this does not preclude Columbia from joining the family of cities in the Southeast that have bike share, it needs to be understood before moving forward.

## Recommended System Plan

This section defines the size and service area of a potential bike share program in Columbia and summarizes the proposed phasing plan. For the purposes of this Plan, the consultant team assessed the potential application of a modular, station-based system, which requires users to return a bicycle to a physical docking station, or a smart-lock system, which permits bicycle utilization and lock-up anywhere within a defined, overall service area. While a system utilizing the latter approach has the potential to serve the needs of a bike share program in Columbia, it remains untested at a city-wide scale. As of December 2014, a city-wide or region-wide system that employs “smart lock” equipment has only recently been launched in Phoenix AZ and Tampa FL.

Based on the results of the Local Context Analysis, including a stakeholder meeting involving key decision-makers of multiple City departments and partnering entities, this Bike Share Plan recommends a modular, station-based bike share system for Columbia. Such systems involve heavy, steel-plate based stations with electro-magnetic docking units, powered through solar panels, wherever possible. The stations include a kiosk and display panel and eight to ten bicycles, on average, would be available within 14 to 18 docking points or racks. Within the geographically-defined service area, Columbia must establish an appropriate station density of roughly ¼ mile spacing (½ mile maximum).



*Cluster of analog bike racks reserved for self-locking bike share (Phoenix Grid bike share)*



*Typical bike share station with steel plates and electromagnetic docking points (Madison B-Cycle)*



## Basis for Service Area Recommendation

Defining the coverage, or “service area”, of the system considers a number of factors including, but not limited to: level of demand, equity, and community input. All three are taken into account in order to determine a recommended service area, station density and phasing.

### Bicycle Demand Analysis

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 (or heat; e.g. the most points

show darkest color) based on where people live, work, go to school, take transit and recreate (shopping, parks, libraries, etc.).

To maximize the financial feasibility of the initial bike sharing system, this Plan proposes that the majority of stations in Phase 1 be launched in areas with the highest demand (see Figure A on following page). This will accelerate financial sustainability of the system and allow subsequent revenues to be directed into expanding the system within both high and lower-demand areas. Subsequent phases are likely to:

- Infill the initial launch area
- Expand into areas contiguous with initial phases that have medium-to-high expected demand
- Expand into new areas that are desirable from a social or geographic equity perspective or as an extension of transit

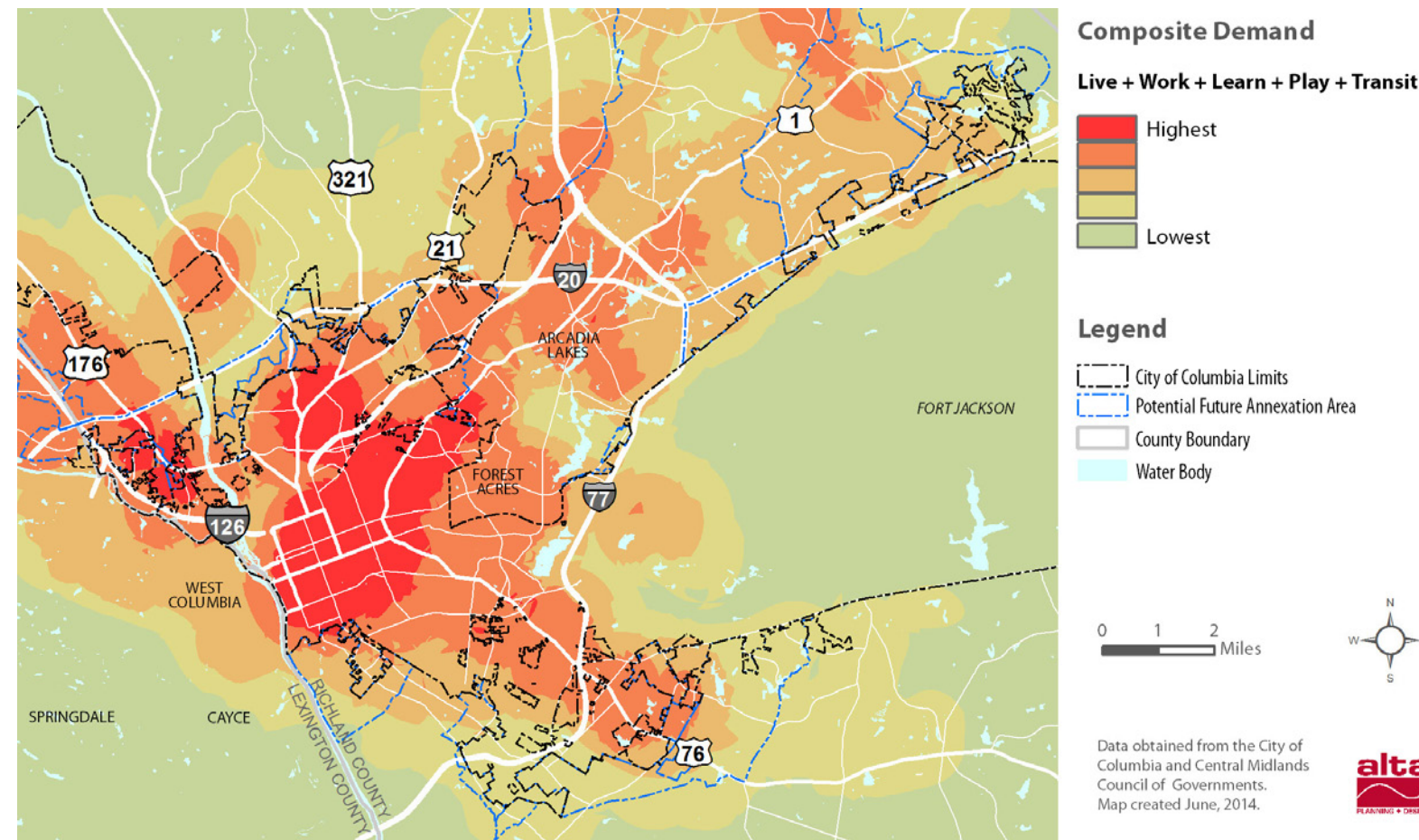


Figure A: Composite Demand Map showing areas with highest level of demand for bike share facilities

Demand for bike share can also be understood by looking at the generators of bicycling activity within Columbia. These include cultural destinations, shopping areas (especially with cafes and restaurants), college campuses, greenways and sports-based destinations. A map showing these destinations in central Columbia is shown on the next page.

### Equity Analysis

While bike share systems have typically launched in high demand areas such as downtowns and higher-income areas, geographic and social equity have become important considerations for new and existing bike share systems. Cities such as Boston, Minneapolis, and Washington D.C. have recently expanded their systems into lower demand areas, with a particular emphasis on making the system available for a greater share of demographic groups and promoting the low-cost bike share transportation option as accessible to

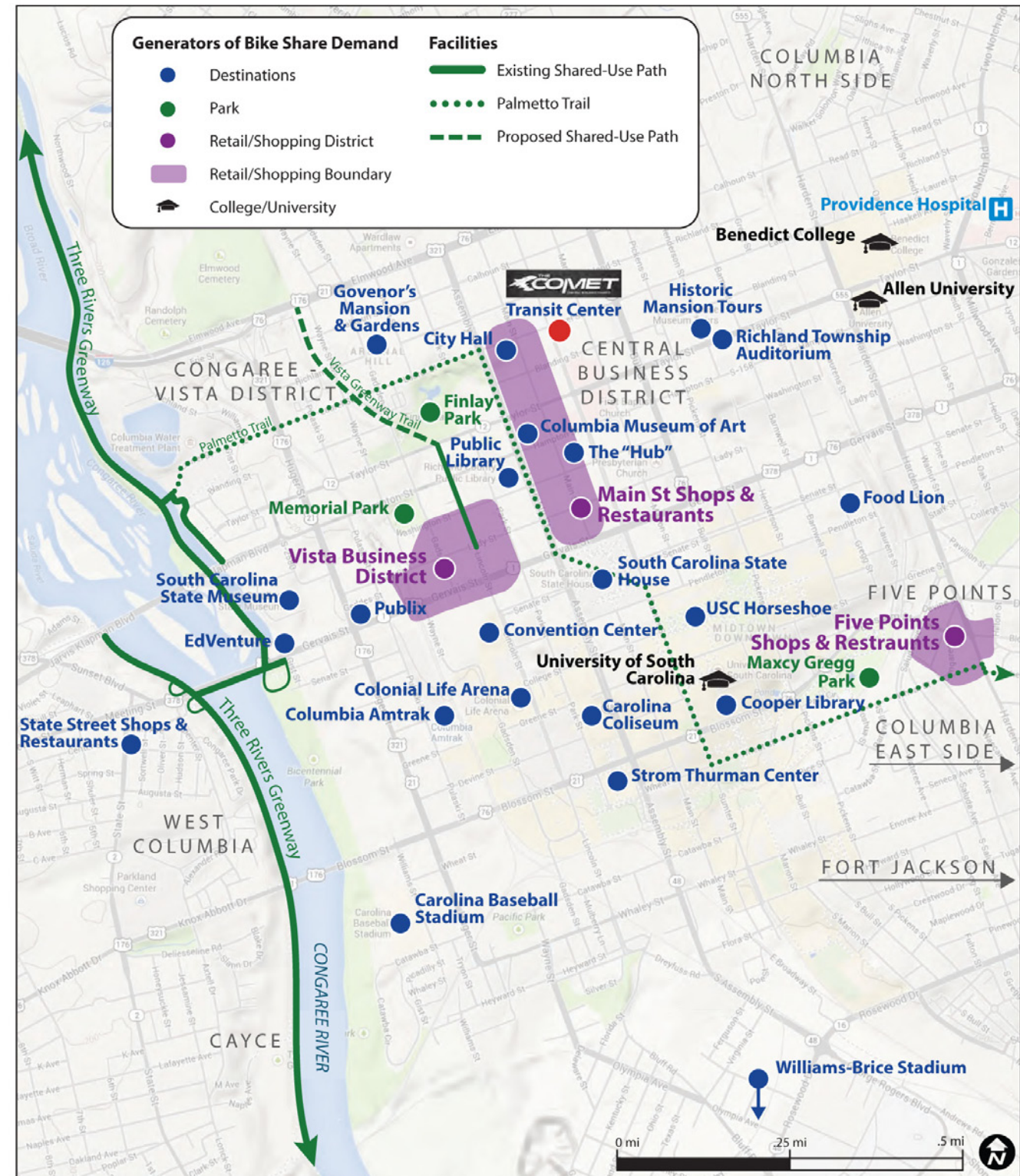


Figure B: Key Generators of Bike Share Demand in central Columbia



under-served communities. Details of the efforts being undertaken in several cities, along with recommended programs for Columbia, are outlined in Section 7 of this memorandum.

With regards to the Service Area Recommendations, a spatial analysis of four variables associated with traditionally underserved populations was undertaken as part of this study. For purposes of analysis, the following **socio-economic indicators that define underserved populations include:**

1. High concentrations of families living below or near the poverty line
2. High concentrations of households without access to a private vehicle
3. High concentrations of non-white households
4. High concentrations of households with a limitation on English speaking ability

A composite of the four indicators above were mapped graphically and shown in Figure C. In aggregate, the equity mapping exercise was used to shape the recommended service area and phasing, helping to shift the overall service area to the northeast to encompass Benedict College, Allen University and the neighborhoods immediately adjacent.

## Community Input

A final consideration related to recommending a phased approach to a bike share program service area is the level of community interest in having bike share stations in neighborhoods and districts, and at particular destinations. Figure D shows suggested station locations from the general public during the community engagement phase of the Pedestrian and Bicycle Master Plan and Bike Share Plan effort. While the public input for bike share received through the online map present a limited piece of overall public interest and demand, the recommended station locations are consistent destinations highlighted as important through the broader public involvement process of the Plan. The project team incorporated the Community Input map with the projected Demand map and the Equity map to outline the recommended bike share service area and subsequent phasing strategy discussed in section 1.3.

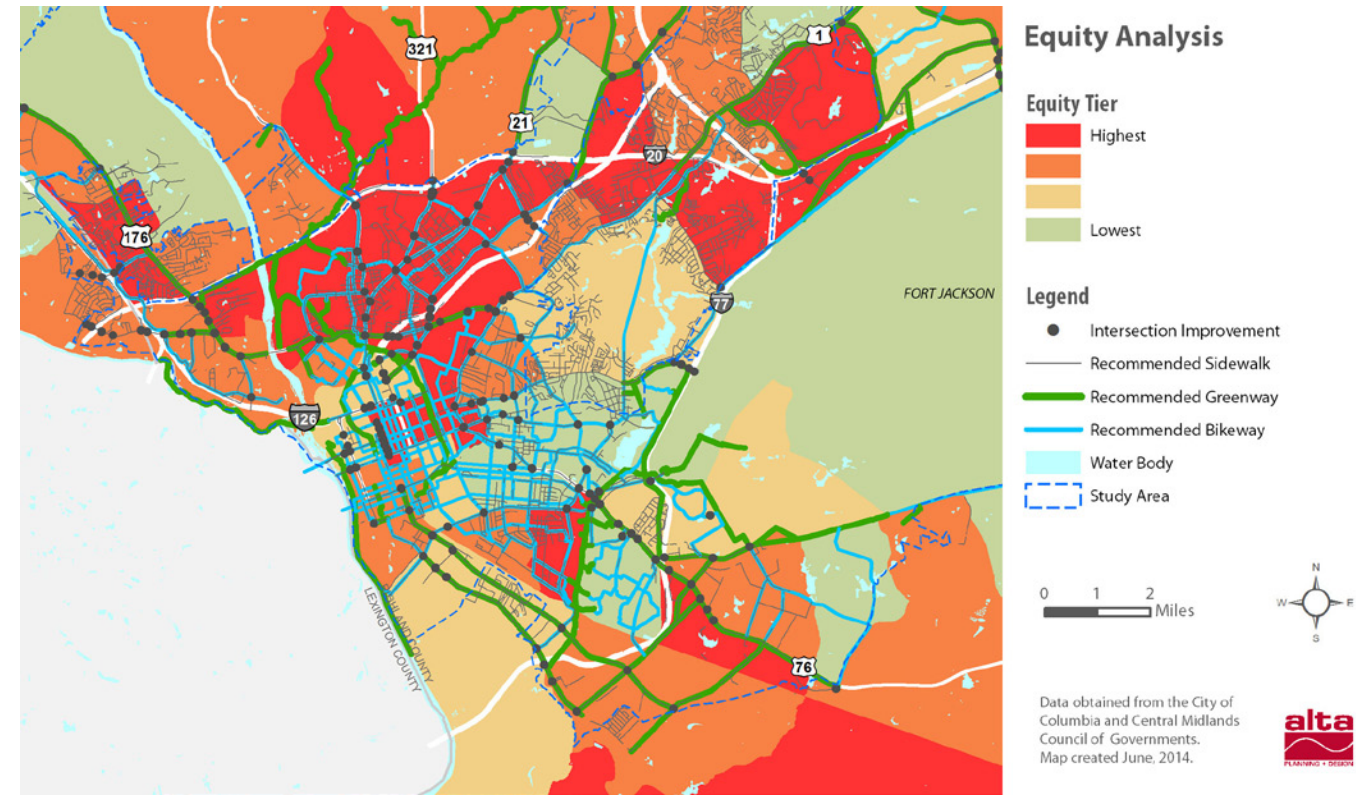


Figure C: Analysis map of areas with greatest need (red and orange) for transportation alternatives from an equity perspective





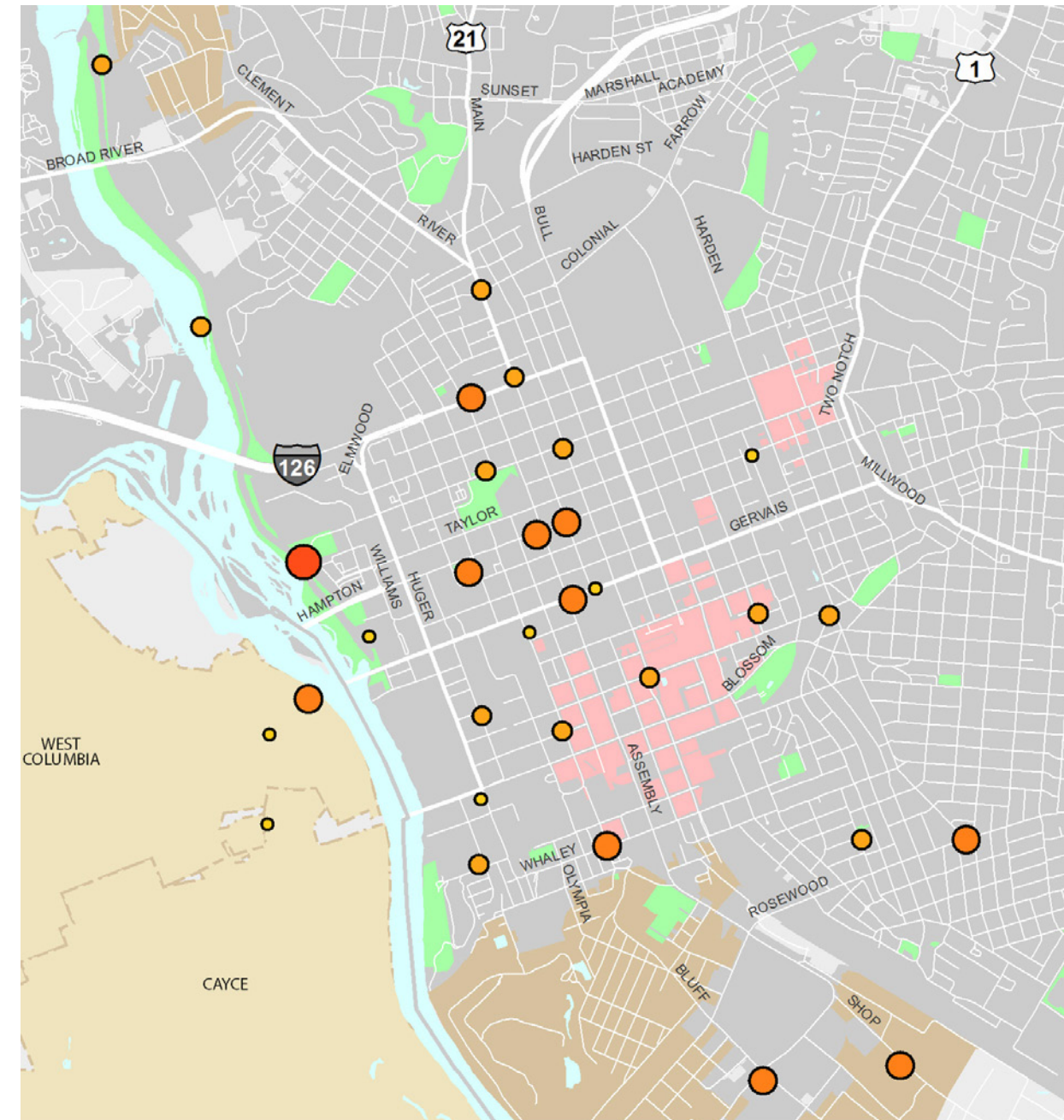
## Station Spacing

Within the defined service area, there is a desirable spacing of stations of approximately ¼ mile (1320 feet) apart from each other. 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.

Within inner Columbia, the recommended bike share service area is approximately two square miles. Although some stations will in fact be within ¼ mile of each other, the estimated number and location of stations diverges from the ideal grid due to:

- The varying nature of demand for bike share within downtown and surrounding districts
- Physical and psychological barriers to bicycle travel such as busy arterials and disruptions in the land use pattern
- Geographic location of destinations in which bike share stations are desired
- Reasonable expectations of funding constraints

**In all cases, it is critical to maintain a contiguous service area with stations no further than ½ mile apart.** Beyond that, bike share stations become isolated, which impacts their utility and makes them far more difficult to maintain and to rebalance with an appropriate number of available bikes.



### Proposed Bike Share Station

#### Votes of Support



### Legend

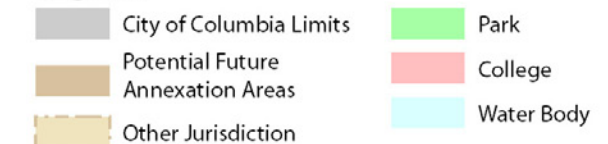


Figure D: Community input of Suggested bike share station locations



## Recommended System and Phasing Plan

The proposed system and phasing plan was developed by incorporating the findings from the Bicycle Demand Analysis, Equity Analysis and Community Input maps and developing a logical roll-out program. **Roll-out should occur in manageable stages that match funding and organizational capacity, yet be large enough to create media attention and provide coverage to key destinations and compact, mixed-use and active areas of Columbia.** Because of this, it is recommended that the first phase of bike share include the heart of downtown Columbia, the USC campus and Five Points. That will ensure stations at highly “brandable” sites such as the South Carolina Statehouse or the Carolina Coliseum.

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

- **Phase I** (15 stations with 135 bikes): the recommended initial launch area covers approximately two square miles in downtown Columbia, the Vista District, the University of South Carolina campus and Five Points.
- **Phase II** (10 additional stations with 90 bikes): the second phase will expand the bike share service area to the CanalSide development, to off-campus housing sites south of USC, and to Providence Hospital. It also includes infill stations downtown, in the Vista District, and at Five Points to provide additional service in these areas of relatively high demand.

The decision to expand and densify the first phase will depend on available funding and the success of the system. **Success is typically measured in terms of visible achievements**, such as:

- high ridership,
- positive public response,
- number of individual and corporate members,
- safety record (few crashes/casualties),
- neighborhood and corporate requests for service area expansion, and
- ongoing financial performance.

Understanding and tracking these metrics will be an important role of the system’s owner and/or operator. 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.

Importantly, 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’s operator have sufficient funds in place to launch and sustain operations.** Lower demand areas will be more difficult for expansion or will need to be more highly subsidized.

The recommended station map (Figure E) indicates general service areas of the phases and approximate locations for bike share stations within the phasing zones. Subsequent site planning and permitting efforts will be required to find the more-precise location for the station footprint itself.

## Station Spacing

Within the central service area, **bike share systems work best when stations are spaced no more than ¼ mile (1320 feet) apart.** 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.

Within inner Columbia, the recommended bike share service area is approximately two square miles. Although some stations may be within ¼ mile of each other, the estimated number and recommended location of stations diverges from the ideal grid due to:

- The varying nature of demand for bike share within downtown and surrounding districts
- Physical and psychological barriers to bicycle travel such as busy arterials and disruptions in the land use pattern
- Geographic location of destinations in which bike share stations are desired
- Available funding that precludes ideal station density until future phases



In all cases, it is critical to maintain a contiguous service area with stations no further than ½ mile apart. Beyond that, bike share stations become isolated, which impacts their utility and makes them far more difficult to maintain and to rebalance with an appropriate number of available bikes.

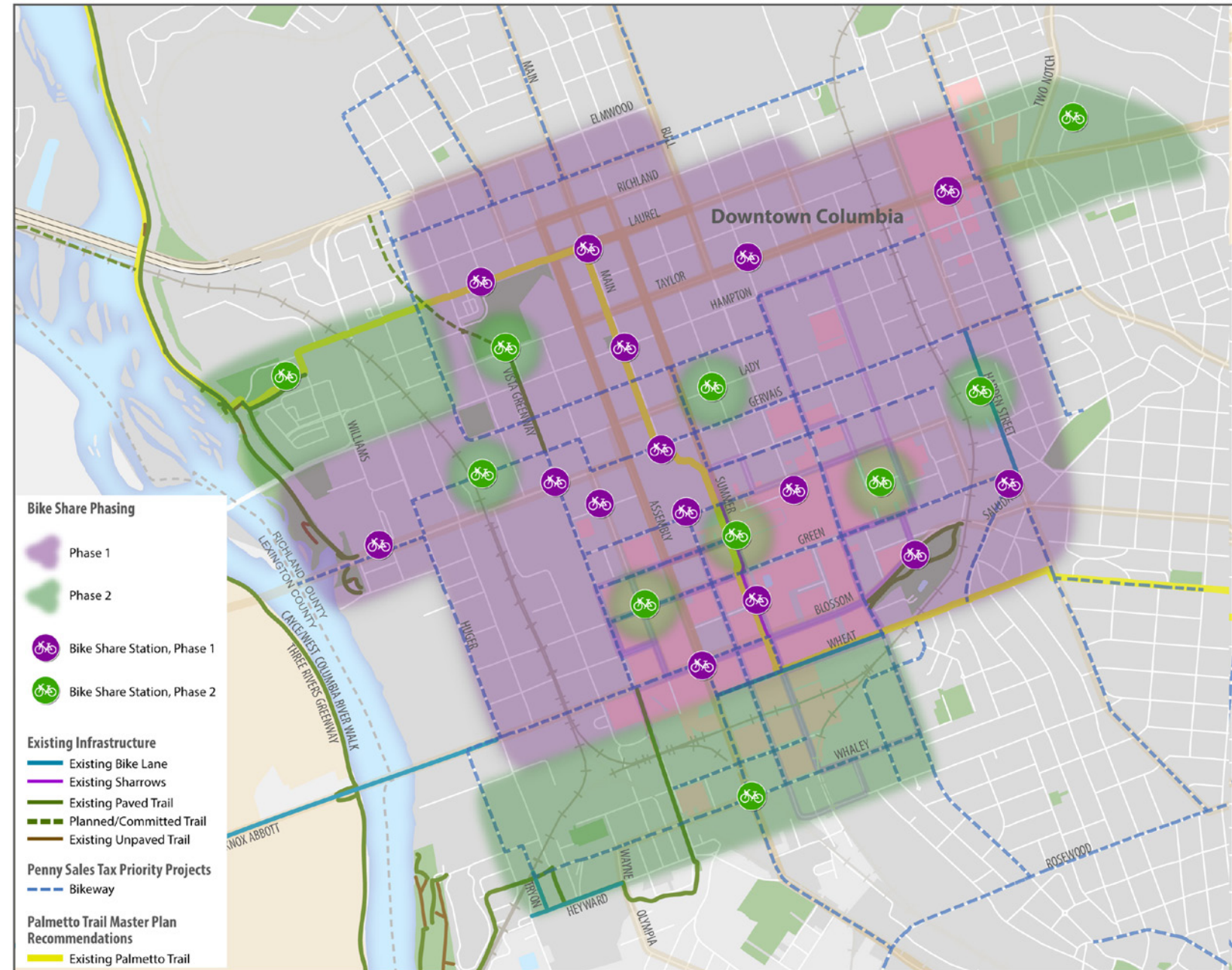


Figure E: DRAFT Bike share service area and station location map



## Recommended Business Model

One of the key early decisions for a city or region 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?

### Types of Business Models

There are generally four business models used for bike share systems in the United States, although 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 US bike share business models is included in **Table 10-1**.

In general, the four primary business models are shown on the following page.

The advantages and disadvantages of the four major models are summarized in **Table 10-2** 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. **Table 10-3** and **Table 10-4** provide further detail on the pros and cons of either ownership or operations separately.

Name	Stations / Bikes	Ownership of Capital Infrastructure	Operations
CoGo, Columbus OH	30 / 300	Public: City of Columbus	Private Operator (Alta Bicycle Share)
Denver B-Cycle	53 / 510	Non-profit: Denver Bike Sharing	Non-profit Operator (Denver Bike Sharing)
Hubway, Greater Boston	140 / 1300	Public: cities of Boston, Cambridge, Somerville and Brookline	Private Operator (Alta Bicycle Share), who has separate contractual agreements with each city within the network
Chattanooga Bicycle Transit	30 / 300	Public: City of Chattanooga	Private Operator (Alta Bicycle Share)
Madison B-Cycle	35 / 350	Public: City of Madison	Non-profit Operator (Madison Bike Share)
GREENbike, Salt Lake City	20 / 160	Non-profit: SLC Bike Share	Non-profit Operator (SLC Bike Share)
DecoBike, Miami Beach	100 / 1,000	Private: DecoBike (private company)	Completely private system, privately owned and operated, concession agreement only.
Pronto, Seattle	50 / 500	Non-profit: Pudget Sound Bike Share	Private Operator (Alta Bicycle Share)

Table 10-1: Sample Bike Share Operating Models in North America



Model 1. Boston Hubway



Model 2. Denver B-cycle



Model 3. Seattle Pronto! bike share



4Model 4. Miami Beach DecoBike

1. **Publicly Owned / Privately Operated:** Under this business model, a government agency 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 (note: certain operating tasks, such as marketing, may be taken on by the jurisdiction).

2. **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.

3. **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.

4. **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.



**Table 10-2: Advantages and Disadvantages of Typical Bike Share Governance Models**

Model	Ownership	Operations	Agency Role	Transparency	Risk	Profits	Operating Expertise	Fundraising	Expansion Potential	Staff Capacity / Interest	Examples
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	Boise Bike Share, ID (Social Bicycle system, to be launched in 2015)
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) GoGo (Columbus OH) Gr:d Bike Share (Phoenix, to be launched in 2015)
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)
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.	Pronto (Seattle, launching fall 2014)
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)



**Table 10-3:** Pros and Cons of Business Model options: OWNERSHIP

Model	PROS	CONS
Public Agency	<ul style="list-style-type: none"> <li>• Highest level of public control and transparency</li> <li>• Profits could be returned to the City or regional entity as revenue, or reinvested into the system for expansion</li> <li>• For a multi-jurisdictional system, a regional agency has greater ability to coordinate among the jurisdictions</li> <li>• May have stronger connections and higher-level experience to bring in federal or state funding</li> <li>• Higher likelihood to coordinate a unified bike share and public transit pass</li> <li>• Strong oversight of contract operator</li> </ul>	<ul style="list-style-type: none"> <li>• Agency may not see it within their mission to govern a bike share system (unless they typically deal with multi-modal transportation)</li> <li>• Concern may exist about potential liability to the city, county, etc.</li> <li>• Requires significant time commitment by agency staff</li> <li>• Some corporate or institutional sponsors may feel uncomfortable dealing with and giving money to a government agency</li> </ul>
Non-Profit	<ul style="list-style-type: none"> <li>• Transparency can be easily achieved through representation on the Board</li> <li>• High likelihood that staff and board will be committed and passionate about bike share as their sole mission</li> <li>• Easily able to accommodate a regional system</li> <li>• More likely to respond to issues related to system equity and promotion of public health</li> <li>• Corporate or institutional sponsors are accustomed to giving to non-profits</li> <li>• Profits can be reinvested into the system for expansion</li> </ul>	<ul style="list-style-type: none"> <li>• Requires investment of time and funding, likely from government partners, sponsors, and other stakeholders</li> <li>• May not be effective at raising local, state, or federal funding</li> <li>• Board composition is critical to help bring in private sponsors</li> <li>• May take longer than other models to organize an ownership, management and Board structure</li> </ul>
For-Profit	<ul style="list-style-type: none"> <li>• A private company takes on risks, leaving very few to the public sector</li> <li>• Can assemble capital relatively quickly</li> <li>• Focus on profitability will increase service and efficiency in high demand areas (especially those frequented by visitors and tourists)</li> </ul>	<ul style="list-style-type: none"> <li>• Government grant monies must be brokered through government agencies</li> <li>• Need to be profitable may limit ability to prioritize equity and public health issues</li> </ul>



**Table 10-4:** Pros and Cons of Business Model options: OPERATIONS

Model	PROS	CONS
Public Agency	<ul style="list-style-type: none"> <li>• If the public agency's primary mission is transportation, they may have some level of relevant experience (eg. the Bi-State Development Agency runs Metro transit, the tram to the top of the Arch and bike rentals at the Arch)</li> <li>• Opportunity to integrate with established transportation/transit practices</li> </ul>	<ul style="list-style-type: none"> <li>• No precedence in the US for a public agency or regional transit authority to operate bike share</li> <li>• Public agency lacks experience and knowledge of bike share operations</li> <li>• Costs related to staffing and union rules will likely make operations more expensive</li> <li>• Multi-jurisdictional bike share programs require multi-jurisdictional agencies</li> </ul>
Non-Profit	<ul style="list-style-type: none"> <li>• Potentially lower cost</li> <li>• Foundation grants and individual donations more likely</li> <li>• With a small system (&lt;200 bikes), non-profit can team with bike shops and/or advocacy groups to assist with maintenance and rebalancing</li> </ul>	<ul style="list-style-type: none"> <li>• Learning curve</li> <li>• If operations performance is poor, it may be difficult for a non-profit to change course quickly</li> <li>• With a larger system (&gt;200 bikes), non-profit may have difficulty assembling experienced staff</li> <li>• Less likely for bike share to become fully integrated into transportation system</li> </ul>
For-Profit	<ul style="list-style-type: none"> <li>• Can handle multi-jurisdictional systems relatively easily</li> <li>• If operations performance is poor for an extended period, a new vendor can be hired for operations</li> <li>• More knowledge and experience with operational issues from other systems</li> <li>• Economies of scale with multiple systems</li> <li>• Can mobilize equipment and staff from other systems if needed</li> </ul>	<ul style="list-style-type: none"> <li>• Need to be profitable may limit ability to prioritize equity and public health issues</li> <li>• Foundation grants and donations less likely</li> </ul>





## Proposed Governance Model

A variety of factors, which are referenced further in this section, informed the Plan's recommended governance model for Columbia. These factors included the results of the Local Context Analysis and a stakeholder meeting of key decision-makers within multiple City departments and partnering agencies and institutions. **The recommended model for Columbia is non-profit ownership with operations performed by either the non-profit itself or contracted out to a private bike share operations company.**

### Proposed Ownership Model: Non-profit Organization

Given the constrained fiscal reality for most local governments, it may be difficult for either the City of Columbia, the County or the Central Midlands Regional Transit Authority to take full ownership of the program. As such, program ownership is a better fit for a non-profit 501c-3, who's Board would be comprised of key political, corporate, institutional and community leaders. Comparable examples are Puget Sound Bike Share (Pronto Cycle Share), Nice Ride Minnesota and Salt Lake City's GREENbike. This model works well in many cities and offers:

- Involvement of numerous stakeholders
- Neutral governance
- Ability to build a dedicated program
- Ability to raise sponsorships and donations
- Ability to expand over time
- Ability to reinvest profits in expansion and operational improvements

Because of the relatively small size of the proposed bike share program in Columbia, it's quite possible that the governance of the system may arise from an existing non-profit organization. Whether this is the case, or if a new 501c-3 is created, **it is critically important that a high-level representative from the City of Columbia—ideally the Mayor's office—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 cannot be raised and permitting challenges cannot be overcome. The lack of leadership also sends the message to the business community that perhaps bike share is not a high priority for the Mayor's office or the City itself. Other critical Board members should include: major funders/sponsors, Public Works leadership, COMET's leadership, University of South Carolina, and non-profit partners, such as the Palmetto Conservation Foundation or downtown business district associations.

Non-profit ownership can also create a level of transparency that will give community leaders and bike share users a solid stake in the oversight of the program. With

a Board comprised of diverse representatives, the opportunities to branch out to neighborhoods beyond the initial launch area will also be highlighted. Regarding fundraising, a strategically-assembled Board can leverage funding from a variety of institutional and corporate sponsors, many of whom are accustomed to giving money to a non-profit.

### Proposed Operations Model: Non-profit Organization or For-profit Vendor

Examples of non-profits successfully operating larger bike share systems include NiceRide Minnesota and Denver B-Cycle. Other non-profits operate small size systems without the need for a private operating partner. This includes highly localized systems with fewer than 250 bicycles, such as Indianapolis Pacers Bike Share, Salt Lake City GREENbike, Kansas City B-Cycle, and the Charlotte, Greenville, and Spartanburg B-cycle systems.

The lead organization for bike share and local partners may decide that a better **alternative would be working with a for-profit vendor for operations.** This takes advantage of the experience and economies of scale coming with a qualified operations vendor, and could be the most efficient way to handle administrative oversight, marketing, risk reduction, training, maintenance and operations. A procurement process will help ensure that private vendors offer competitive prices and are truly the right fit for Columbia as well. In determining the best approach for managing operations, Columbia's bike share owner should consider the high value placed on design quality, quality of customer service, and a well-maintained, orderly bike share system. Both the public outreach process for this Plan and the stakeholder meeting revealed consensus around these values.



## System Costs

There are four major costs associated with a bike share program in Columbia: 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 potential system.

One important over-arching assumption is that an established and “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. System estimates are based on a heavy, steel-plate based station with electro-magnetic docking units.

### Launch Costs

There are a number of “general system 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 employees, procuring a 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 or public agencies, e.g., to use a city-provided warehouse space. Each phase has a start-up cost also. This includes site planning and permitting, bike and station assembly, station installation, etc.

**For the proposed system in Columbia, launch costs are expected to be:**

- Phase 1: a onetime cost of \$216,000 (or \$1,600 per bike X 135 bikes; 15 stations)
- Phase 2: \$144,000 for expansion (90 bikes; 10 stations).

### Capital Costs

These are the costs associated with purchase of equipment including stations, kiosks, bikes, and docks. Equipment costs vary depending on:

- the equipment selected (recommended steel plate/dock-based stations)

- 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

Per station capital costs vary between vendors and depending on features and station size, but typically range from \$30,000 (low end at \$3,300/bike) to \$55,000 (high end at \$6,000/bike) per station.

**For the proposed system in Columbia, capital costs are expected to range from:**

- Phase 1: \$450,000 – \$825,000 for the proposed 15 stations
- Phase 2: \$300,000 – \$550,000 for 10 additional stations (*note: does not include potential price changes related to inflation*)

### Administrative Costs

There will be costs associated with administering the program by the equipment owners. For any type of governance model, **a total of \$10,000 has been budgeted for this service as the lead-in to Phase 1 with \$5,000 as the lead-in to Phase 2.** These costs relate to recruiting and securing full and part-time staff and special marketing efforts that are most prevalent during launch year and the build-up to Phase 2 expansion. Longer-term, the agency, non-profit or private company that owns and administers the bike share program will have administrative costs associated with staff positions, marketing, and general expenses. These are included in operating costs below.

### 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, occasional snow removal, removing litter and graffiti, etc.
- **Bike maintenance:** including regular inspection and servicing of bikes as well as maintaining equipment inventory, etc.
- **Rebalancing:** includes staff time and equipment associated with moving bikes



from full to empty stations – typically the highest operating cost for a system.

- **Customer service:** providing a responsive customer interface for enquiries 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) that will need to be reached between the system’s owner and the City of Columbia.** The SLA sets out the operating terms that must be met: how long a station can remain empty, how often bikes are inspected, snow removal policy and others. The agreed upon service levels will need to balance operating costs with the impact on customer service from any operating cost cuts.

Depending on the service-level expectations, operating costs could range from \$90 to \$120 per dock per month. This is based on experience with steel plate and electromagnetic docking systems that currently exist throughout North America.

For the proposed system in Columbia, \$105 per dock per month is used as an



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

average for operating costs. **For Phase 1, this amounts to \$323,820** per year for a 257 dock system. (A dock-to-bike ratio of 1.8-2.0 is recommended for bike share, so 257 docking points could accommodate the 135 bikes anticipated for Phase 1.) **An additional \$215,460** for 171 additional docking points per year **will be needed for the Phase 2 expansion.** For the anticipated average of 9 bikes per station, this equates to annual operations costs of approximately \$2,200 per bike.

## Cost Summary

Five-year cost forecasts for a bike share system in Columbia for both Phase 1 and 2 are shown in Table 3-1 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.

Year	0	1	2	3	4	5
# of stations/hubs	15	15	15	25	25	25
# of bikes	135	135	135	225	225	225
# of docks/racks (1.9 per bike)	257	257	257	428	428	428
launch costs	\$216,000	\$0	\$0	\$144,000	\$0	\$0
capital costs (high)	\$825,000	\$0	\$0	\$550,000	\$0	\$0
admin. costs	\$10,000	\$0	\$0	\$5,000	\$0	\$0
operations costs	\$0	\$323,820	\$323,820	\$539,280	\$539,280	\$539,280
<b>Cost sub-total</b>	<b>\$1,051,000</b>	<b>\$323,820</b>	<b>\$323,820</b>	<b>\$1,238,280</b>	<b>\$539,280</b>	<b>\$539,280</b>
<b>Cost Cumulative</b>	<b>\$1,051,000</b>	<b>\$1,374,820</b>	<b>\$1,698,640</b>	<b>\$2,936,920</b>	<b>\$3,476,200</b>	<b>\$4,015,480</b>

**Table 11-1:** Five-Year Cost Estimate for Columbia Bike Share - Equipment



# System Revenues

One of the goals (born frequently out of necessity) of many bike share systems is to use a diverse range of revenue sources. Potential revenues include user-generated trip and membership fees as well as grant funding, private foundation contributions and donations, advertising and/or sponsorship, and other sources. This section provides an overview of potential revenue sources based on experience in other cities. A funding strategy that identifies what combination of revenues might be available within Columbia is presented in Section 5.

## User Revenues

Some systems record a high-enough demand such that user revenues cover the cost to operate the system (e.g. in Washington D.C. and Chicago). While this is not possible in every city, **user-generated revenues can provide a significant level of income.**

Forecasting user-generated revenues for a bike share program in Columbia requires: (a) establishing a rate 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 a 24-hour subscription to annual membership.
- **Usage fees:** charged to the user based on how long they use the system. Most systems offer a “free ride” period, typically between 30 and 45 minutes where the user pays no additional costs if the bike is returned within that timeframe. Fees are charged to users who exceed the free-ride period, and increase exponentially with each additional 30 minute period of use.

The logic of the rate system 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 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 30-45 minute free-ride period. Following are the types of memberships that have been implemented in other bike share systems:

- Annual (365 days, or less for some three-season systems in northern cities)
- Monthly (30 days)
- Weekly (7 days)
- 72 hour (3 days)
- 24 hour (1 day)

In most dock-based systems, monthly and annual memberships are purchased online via a credit card. The operator mails an RFID-based card or a key to the member at the address given on the website. All other memberships—weekly, 72 hour and 24 hour—are purchased at the kiosk.

**Table 12-1:** 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
<b>Columbia (Proposed)</b>	<b>\$75</b>	<b>\$25</b>	-	<b>\$15</b>	<b>\$6</b>
Chattanooga TN	\$75	-	-	-	\$6
Charlotte B-cycle	\$65	-	-	-	\$8
Des Moines B-cycle	\$53	\$32	\$21	-	\$6
Greenville B-cycle	\$60	-	\$15	-	\$5
Hubway (Boston)	\$85	\$20	-	\$12	\$6
Madison WI B-Cycle	\$65	-	-	-	\$6
Salt Lake City GREENbike	\$75	-	\$15	-	\$5
Hamilton ON SoBi	\$85	\$15	-	-	\$3/hour

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 between 30 and 45 minutes depending on the system and increasing fees for subsequent 30 or 60 minute periods. Miami Beach DecoBike offers a \$24 day pass that allows for unlimited use within a 24 hour period (more like a rental bike). **In the Southeast, existing bike share systems generally offer a 60 minute grace period.** This includes Chattanooga, Greenville, and Spartanburg, and Charlotte (the latter of which offers 60 minutes for annual members and 30 minutes for 24-hour pass purchasers).



Table 12-2 summarizes overtime usage fees for North American bike share systems and suggests a proposed rate structure for Columbia.

**Table 12-2:** Usage Fees for North American Bike Share Systems

System	Usage Fees (cumulative)				Each 30 minutes thereafter	Max 24-hour charge
	0-30 min	30-60 min	60-90 min	90-120 min		
Columbia (Member)	\$0	\$1.50	\$4.50	\$10.50	\$6.00	\$80
Columbia (Casual User)	\$0	\$2.00	\$6.00	\$14.00	\$8.00	\$100
Capital Bikeshare (Annual member)	\$0	\$1.50	\$4.50	\$10.50	\$6.00	-
Capital Bikeshare (Casual user)	\$0	\$2.00	\$6.00	\$14.00	\$8.00	-
Charlotte B-Cycle	\$0	\$0	\$4.00	\$8.00	\$4.00	\$75
Chattanooga	\$0	\$0	\$5.00	\$10.00	\$5.00	\$100
Denver Bikesharing	\$0	\$1.00	\$5.00	\$9.00	\$4.00	-
Hubway (Annual member)	\$0	\$1.50	\$4.50	\$12.50	\$6.00	\$80
Hubway (Casual user)	\$0	\$2.00	\$6.00	\$14.00	\$8.00	\$100
Madison B-Cycle	\$0	\$2.00	\$7.00	\$12.00	\$5.00	\$75
Miami Beach DecoBike	\$0	\$4.00	\$8.00	\$16.00	\$4.00	\$120
Hamilton ON SoBi	\$0	\$0	\$2.50	\$5.00	\$2.50	\$115

The length of the free-ride period varies between systems. For most systems, the free-ride period is 30 minutes, but some systems have increased this to 45 minutes or 60 minutes (e.g. in Chattanooga or Hamilton, Ontario). The decision to lengthen the free-ride period beyond 30 minutes needs to consider:

- **The impact to and encroachment on the bike rental market.** The original intent of bike share is to provide a short trip mobility option not in competition with bike rental shops that accommodate users for longer trips.
- **Reduction in user fees, particularly from casual users.** Providing a 45-minute or 60-minute free-ride period lengthens the window for a user to return the bike. Currently, 16% of casual subscribers' trips in Minneapolis and 19% of casual subscribers' trips in Washington D.C. are between 30 and 60 minutes and subject to user fees (\$2.00 per trip). Although this distribution may change with a new time-limit structure, this represents lost revenue. It



is feasible to have a longer free-ride period for annual members only, which would result in minimal revenue loss, while retaining the 30 minute period for casual users.

- **Increasing to 45- or 60-minutes is convenient for tourists and visitors.** Accommodating this market may attract added interest from the tourist industry to become potential sponsors, which may subsidize reduced revenue from user fees.
- In 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.

## Special Memberships

In the early history of US bike share systems, annual membership tended to grow organically from people making use of the convenience of the system. This helped to support the growth and visibility of cycling overall in their city. However, more recently, cities have made a deliberate push to increase their membership, often employing staff dedicated to “member services” and programs. Some of the initiatives listed below should be considered for the bike share program in Columbia:

- **Introductory membership:** Boston Hubway had particular success with signing annual members at an introductory rate (\$60 per year compared to \$85 per year) and offered this rate for its first year of operations. In Des Moines, they currently offer a \$40 introductory rate, discounted from \$53 for annual memberships.
- **Shorter-period memberships:** Hubway has also introduced a 3-day membership for \$12 to capture the weekend market and has implemented monthly memberships to overlap with the monthly membership period of the transit agency. Because college students are able to use Hubway for a limited period throughout the year (April-May, Sept-Nov), one intention is for this option to be popular with that user group.
- **University and Travel Demand Management Programs:** these programs offer a greatly discounted rate for bulk purchase by an organization. An example of this sort of program is B-Cycle Madison’s partnership with UW Madison – Transportation Services to offer annual membership for \$20 (a \$45 discount). This program generated approximately 900 members in 2012.
- **Corporate memberships:** numerous cities now offer discounted corporate membership. For example, Hubway in the Boston area offers varying levels of corporate membership that allow organizations to partially or fully cover

the discounted membership fee (\$50 rather than \$85 per year) and/or be responsible for employee usage fees.

- **Subsidized memberships:** systems such as Hubway have implemented programs, often through grant funding, to provide subsidized membership (sometimes for as low as \$5) to low income individuals and community groups working with low income individuals.

## Membership and Ridership Forecast

Bike share ridership depends on a number of factors including the physical and built environment of the host 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 Columbia was based on observed monthly station and user demands in the Hubway system in Greater Boston, CoGo in Columbus, OH, and Capital Bikeshare in metro Washington DC. Although not all of these are considered “peer” cities with Columbia, they each have a bike share system that has been fully functional for at least one year. 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 Columbia.

The model was applied to the proposed Station Location Plan in Columbia 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 1 (15 stations in place at the start of Year 1) and Phase 2 (an additional 10 stations, assumed in place at the start of Year 3) is presented in *Table 4-3*. **It shows an annual forecast demand of approximately 29,000 trips in Year 1 ramping up to approximately 93,000 trips in Year 5.** The number of daily trips taken per bike is expected to start out at approximately 0.6 trips per bike per day in Year 1 and increase to 1.1 trips per bike per day in Year 5. A big jump in system use occurs after the expansion of the system in projected year 3. With the infusion of ten phase 2 stations, the network-effect becomes more prominent and potentials users find bike share to be far more convenient and accessible.

User revenues were estimated by applying the proposed rate structure to these forecasts and are summarized in **Table 12-3** as well. **Over five years, user revenues are expected to generate between \$68,000 and \$232,000 per year, or roughly \$780,000 cumulatively.**



**Table 12-3:** PRELIMINARY Five-Year Usage Forecast for Columbia Bike Share

	Year 1	Year 2	Year 3	Year 4	Year 5
<i>Trips</i>					
Phase 1 (15 stations)	29,000	39,000	37,000	40,000	48,000
Phase 2 (10 stations)	na	na	34,000	47,000	45,000
Total	23,000	31,000	71,000	87,000	93,000
Trips / Bike / Day	0.59	0.79	0.86	1.06	1.13
<i>Annual Members</i>					
Number	500	700	1,300	1,500	1,700
Trips	23,000	31,000	57,000	69,000	73,000
<i>Casual Users</i>					
Number	2,600	3,700	6,700	8,300	8,700
Trips	6,000	8,000	14,000	18,000	19,000
<i>Revenues</i>					
Annual Memberships	\$38,000	\$53,000	\$98,000	\$113,000	\$128,000
Member Trip Fees	\$2,000	\$3,000	\$5,000	\$6,000	\$6,000
Casual User Subscriptions	\$27,000	\$38,000	\$67,000	\$84,000	\$87,000
Casual User Trip Fees	\$7,000	\$9,000	\$16,000	\$20,000	\$22,000
Projected Refunds	(\$6,000)	(\$7,000)	(\$12,000)	(\$12,000)	(\$11,000)
<b>Total Annual User Revenue</b>	<b>\$68,000</b>	<b>\$96,000</b>	<b>\$174,000</b>	<b>\$211,000</b>	<b>\$232,000</b>
<b>Cumulative User Revenue</b>	<b>\$68,000</b>	<b>\$164,000</b>	<b>\$338,000</b>	<b>\$549,000</b>	<b>\$781,000</b>
Revenue/bike/year	\$504	\$711	\$773	\$938	\$1,031



## Forecast Validation

Forecasts for Columbia 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 Columbia of 0.6 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) or Chattanooga (0.8 trips / bike / day) all of which are larger cities and have a more-developed bike network. **Table 12-4** includes a comparison with other bike share systems.
- Members per bike ratio: the Columbia system is expected to have a member-per-bike ratio of nearly 3.7:1, which is within the range of some bike share systems, but lower than others (see Table 12.5).
- Trips per member ratio: the Columbia bike share system is expected to operate at approximately 46 annual trips per annual member, which is significantly 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 at 32 annual trips/member (see Table 12.5).

**Table 12-4:** Trip Comparison with US Bike Share Systems (Inaugural Season)

	Year (Season)	Operating Days	Annual Trips	Bikes	Trips / Bike / Day
<b>Columbia (estimate)</b>	<b>TBD</b>	<b>365</b>	<b>29,000</b>	<b>135</b>	<b>0.59</b>
Chattanooga	2013 (1 <sup>st</sup> )	365	73,000	265	0.76
Denver B-Cycle	2010 (1 <sup>st</sup> )	224	103,000	500	0.92
Boston Hubway	2011 / 2012 (1 <sup>st</sup> )	240	380,000	610	2.60
Madison B-Cycle	2012 (2 <sup>nd</sup> )	258	63,000	290	0.84
Columbus CoGo	2013-2014 (1 <sup>st</sup> )	365	50,000	220	1.04
Nice Ride MN	2010 (1 <sup>st</sup> )	150	101,000	600	1.12
San Antonio	2011 (1 <sup>st</sup> )	274	32,000	140	0.83
SLC GREENbike	2013 (1 <sup>st</sup> )	242	26,124	65	1.7





**Table 12.5:** Membership Comparison with US Bike Share Systems

	Year (Season)	Bikes	Annual Members	Members / Bike	Total Annual Member Trips	Trips / Annual Member
<b>Columbia</b>	<b>TBD (1<sup>st</sup>)</b>	<b>135</b>	<b>500</b>	<b>3.7</b>	<b>23,000</b>	<b>46</b>
Chattanooga	2013 (1 <sup>st</sup> )	265	550	2.1	17,500	32
Denver B-Cycle	2011 (2 <sup>nd</sup> )	520	2,675	5.1	122,000	46
Boston Hubway	2012 (1 <sup>st</sup> full)	610	3,815	6.3	244,000	64
Madison B-Cycle	2012 (2 <sup>nd</sup> )	290	2,150	7.4	39,000	18
Nice Ride MN	2010 (1 <sup>st</sup> )	600	1,295	2.2	65,000	50
SLC GREENbike	2013 (1 <sup>st</sup> )	65	No Data Available			

The comparison of predicted statistics for a bike share system in Columbia 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](http://www.fhwa.dot.gov/environment/bicycle_pedestrian/funding/faq_bikeshare.cfm)

There are a number of factors to consider before pursuing federal funds:

- There is a significant amount of competition for federal funds and grants, and a detailed understanding of the application process is often required.
- Going after discretionary federal funding for bike share comes with some level of risk that it could compete with other regional transit, greenway and non-motorized transportation projects
- These sources are generally less flexible than other funding sources, e.g., FTA funding may only be used for bike share docks, equipment, and other capital costs but not for purchasing bicycles or for launch and operating costs, whereas FHWA funding can be used for all equipment including bikes. Few grants are available for operations.



- There may be additional requirements such as “Buy America” provisions for steel and iron products, NEPA environmental assessment, etc.
- There are often delays associated with the application, evaluation, and distribution of funds, which can delay deployment. There may also be a timeline within which to use the funds, which can create difficulties in piecing together several grants.

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 uncertainty) of funding annual operating costs.

Ongoing public funding could potentially come from local “steady stream” sources such as parking revenues, bus bike rack advertising, special taxes, or distribution of license plate fees. Station purchase could also form part of the use of Traffic Impact Fees or form part of a developer’s travel demand management strategy.

## Private Foundations

Private funding sources such as foundation grants, donations, or in-kind support offered by private, non-profit, or philanthropic organizations will form part of a diversified financial strategy. These sources are important in contributing the local match for federal grants or continuing cash flow for operations. Possible sources for private funding in Columbia could range from the Central Carolina Community Foundation to the Blue Cross Blue Shield Foundation.

## 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 and/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, and/or website) with a logo and/or statement that “Company X supports Columbia bike share”.

Sponsorship provides a significant funding opportunity in Columbia given the number of 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 roughly \$5,000 to \$15,000 per station per year is achievable in Columbia 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 12-5**. 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 cities’ size, density and media presence are not comparable to most other American cities, including Columbia. 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 12-6** outlines the variety of sponsorship agreements from some US bike share programs.

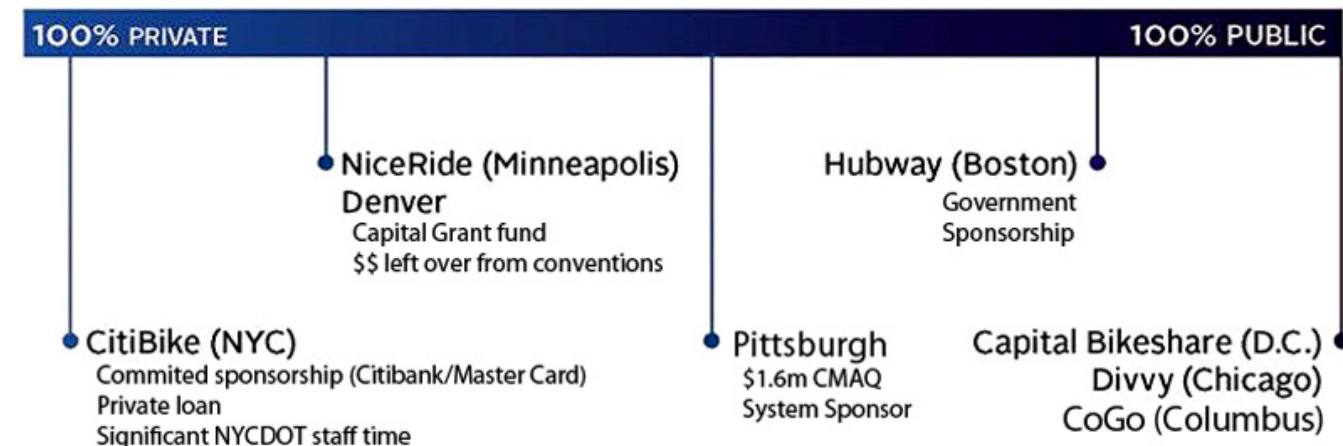
## Revenue Summary

The reality for nearly all American bike share systems is that a diverse and creative mix of revenue sources are needed to purchase and operate a bike share program. Many systems have relied on Federal grant funding through the Federal Transit Administration or via CMAQ grants to pay for a substantial portion of capital costs (eg. Hubway in Boston, Capital Bikeshare in DC and Divvy in Chicago). Columbus OH was one of the only examples of a system purchase being entirely paid for out of a city's Capital Budget (in that case, \$2.3 million). On the other extreme, the private sector supported the capital costs for New York City's Citi Bike system and Miami Beach's DecoBike. The Citibank Corporation not only paid for the full sponsorship rights to New York's system but has recently funded the expansion of DecoBike into the City of Miami (renaming the system "Citi Bike" in the process).

Federal grants are more difficult to come by for operations however. To pay for maintenance and operations, a standard mix of sponsorship dollars and user fees are the most prevalent, with some systems incorporating advertising revenues as well. A handful of large-city systems have become so popular—especially with visitors and tourists purchasing 24-hour passes—that they have become nearly or entirely self-sustaining. One hundred percent of the operations costs for Capital Bikeshare, DecoBike and Divvy are now paid for through user fees. Additional funding that comes through sponsorship or advertising is able to be reinvested in the system, via expansion or improvements to bicycle infrastructure, if appropriate.

Smaller systems or those with a far smaller tourist economy will need to rely on some type of sponsorship to pay for operations. Revenue recovery in such cities is relatively small and ranges typically from 20% - 50%. Based on the modeling completed for this study, Columbia is anticipated to generally fall into this category. The Preliminary Financial Plan in the following section articulates the financial gap necessary to fund both capital and operations for bike share in Columbia.

## Bike Share Funding: Capital - Equipment, Launch Costs





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., Montreal or Toronto). <b>Commitment is typically a 3-5 year period.</b>	<ul style="list-style-type: none"> <li>Title: One-time sale of sponsorship</li> <li>Known timeline and full “occupancy”</li> <li>Consistent and recognizable branding</li> </ul>	<ul style="list-style-type: none"> <li>Often difficult to secure sponsor given the large investment</li> <li>Less opportunity for smaller businesses to get involved</li> <li>Competing brands can conflict certain tenants or nearby businesses</li> </ul>
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.) <b>Commitment is typically a 3-5 year period.</b>	<ul style="list-style-type: none"> <li>System branding with sponsors allows for future flexibility</li> <li>A strong, active sponsor adds marketing and outreach value</li> <li>Opportunities for businesses of all sizes to be involved</li> <li>Solid funding stream to complement user fees and government investment</li> <li>Can bring in multiple sponsors</li> </ul>	<ul style="list-style-type: none"> <li>Significant effort required to secure and retain sponsors</li> <li>Not enough money to fully fund system, typically</li> </ul>
Station 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. <b>Commitment is typically a 3 year period.</b>	<ul style="list-style-type: none"> <li>Opportunities for businesses of all sizes to be involved</li> <li>Opportunity to value sponsorship by station demand</li> </ul>	<ul style="list-style-type: none"> <li>Income relies on “uptake” of a certain amount of sponsorship each year</li> <li>Significant effort required to secure and retain sponsors</li> </ul>
Other sponsors	Numerous options available, such as one-time sponsors (eg Volkswagen paid for day-passes in Chattanooga during a high profile weekend), product partners, media sponsors, and other ideas. <b>Commitment is typically a 1-3 year period.</b>	<ul style="list-style-type: none"> <li>Opportunities for businesses of all sizes to be involved</li> <li>Builds strength in community by valuing bike share</li> </ul>	<ul style="list-style-type: none"> <li>Significant effort required to secure and retain sponsors</li> </ul>

**Table 12-5:** Common Bike Share Sponsorship Models in the United States



Program	Year Launched	Sponsorship Type	Sponsorship Agreement
Divvy, Chicago	2013	Presenting Sponsor	\$12.5 million for five years from Blue Cross Blue Shield of Illinois
CoGo, Columbus OH	2013	Presenting Sponsor	\$1.25 million for five years from Medical Mutual
Denver B-Cycle	2010	Presenting Sponsor	\$1.3 million from Kaiser Permanente with some additional funds from Foundations
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
Kansas City B-Cycle	2012	Presenting Sponsor	\$350,000 per year from Blue Cross Blue Shield
DecoBike, Miami Beach	2011	Privately owned	NA
Chattanooga Bike Transit	2013	Title Sponsor	\$100,000 from the Lyndhurst Foundation that provided match for federal funds
Pacers Bike Share Indianapolis	2014	Title Sponsor	Herbert Simon Family Foundation via the Indiana Pacers NBA franchise
Nice Ride, Minneapolis	2010	Presenting Sponsor	\$1 million from Blue Cross Blue Shield tobacco settlement funds
Pronto, Seattle	2014	Presenting Sponsor	\$2.5m from Alaska Airlines with support for helmet vending machines from Seattle Children's Hospital
GREENbike, Salt Lake City	2013	Presenting Sponsor	For 3 yr period: \$250,000 from SelectHealth (logo on rear fender) and \$100,000 from RioTinto ( front basket)

**Table 12-6:** Sponsorship funding sources for US bike share programs



# Preliminary Financial Plan

The financial plan compares system costs and revenues over the course of a five-year forecast period to determine annual cash flow and resulting surplus or shortfall expected from the bike share program for Columbia. This chapter also presents a funding strategy for Phase I of the project.

## Cash Flow Analysis

Previous sections of this Plan presented expected system costs (Section 3), user-generated, sponsorship, and other revenues (Section 4). These are compared over the first five years of operations for a 15-station system that expands to 25 stations during the third full year of operations and remains that size through year 5.

The purchase, launch and five-years of operations for Phase I and II—15 stations, increased to 25 stations—will require between \$3.4 - \$4.0 million, depending on the equipment and technology chosen. Revenues will come from a combination of sponsorship, grants, private foundation funding, and user-generated revenues.

**Based on the demand model, user-generated revenue projections will range from roughly \$68,000 to \$232,000 per year, with a cumulative five-year projection of \$781,000. The percentage of operations covered by user fees equals 21%-43% over the five year period. This leaves a funding gap of \$2.6 - \$3.2 million over the full five year period that will need to be filled with a likely mix of public and private dollars.** Previous sections in this Plan outline opportunities to raise capital and operations money through Federal grants, private foundations, sponsorship and potential advertising revenues.

**Table 13-1.1: Low Cost**

year	0	1	2	3	4	5
# of stations/hubs	15	15	15	25	25	25
# of bikes	135	135	135	225	225	225
# of docks/racks (1.9 per bike)	257	257	257	428	428	428
<b>COSTS</b>						
launch costs	\$216,000	\$0	\$0	\$144,000	\$0	\$0
capital costs (high)	\$450,000	\$0	\$0	\$300,000	\$0	\$0
admin. costs	\$10,000	\$0	\$0	\$5,000	\$0	\$0
operations costs	\$0	\$323,820	\$323,820	\$539,280	\$539,280	\$539,280
<b>Cost sub-total</b>	<b>\$676,000</b>	<b>\$323,820</b>	<b>\$323,820</b>	<b>\$539,280</b>	<b>\$539,280</b>	<b>\$539,280</b>
<b>Cost Cumulative</b>	<b>\$676,000</b>	<b>\$999,820</b>	<b>\$1,323,640</b>	<b>\$2,311,920</b>	<b>\$2,851,200</b>	<b>\$3,390,480</b>
<b>REVENUE PROJECTIONS</b>						
User-generated revenue	\$0	\$68,000	\$96,000	\$174,000	\$211,000	\$232,000
“Farebox Recovery” rate	na	21.0%	29.6%	32.3%	39.1%	43.0%
Sponsorship revenue	\$0	\$0	\$0	\$0	\$0	\$0
Public funds/grant revenue	\$0	\$0	\$0	\$0	\$0	\$0
Other revenue sources	\$0	\$0	\$0	\$0	\$0	\$0
<b>Revenue sub-total</b>	<b>\$0</b>	<b>\$68,000</b>	<b>\$96,000</b>	<b>\$174,000</b>	<b>\$211,000</b>	<b>\$232,000</b>
<b>Revenue Cumulative</b>	<b>\$0</b>	<b>\$68,000</b>	<b>\$164,000</b>	<b>\$338,001</b>	<b>\$549,001</b>	<b>\$781,001</b>
<b>CASH FLOW</b>						
Annual shortfall	-\$676,000	-\$255,820	-\$227,820	-\$814,280	-\$328,280	-\$307,280

**Table 13-1.1:** Five Year Financial Forecast for “low” and “high” cost equipment (15 stations Year 1-2 and 25 stations in years 3-5. Note that annual inflation were not factored into the costs above)



**Table 13-1.2: High Cost**

year	0	1	2	3	4	5
# of stations/hubs	15	15	15	25	25	25
# of bikes	135	135	135	225	225	225
# of docks/racks (1.9 per bike)	257	257	257	428	428	428
<b>COSTS</b>						
launch costs	\$216,000	\$0	\$0	\$144,000	\$0	\$0
capital costs (high)	\$825,000	\$0	\$0	\$550,000	\$0	\$0
admin. costs	\$10,000	\$0	\$0	\$5,000	\$0	\$0
operations costs	\$0	\$323,820	\$323,820	\$539,280	\$539,280	\$539,280
<b>Cost sub-total</b>	<b>\$1,051,000</b>	<b>\$323,820</b>	<b>\$323,820</b>	<b>\$1,238,280</b>	<b>\$539,280</b>	<b>\$539,280</b>
<b>Cost Cumulative</b>	<b>\$1,051,000</b>	<b>\$1,374,820</b>	<b>\$1,698,640</b>	<b>\$2,936,920</b>	<b>\$3,476,200</b>	<b>\$4,015,480</b>
<b>REVENUE PROJECTIONS</b>						
User-generated revenue	\$0	\$60,000	\$78,000	\$157,000	\$195,000	\$209,000
“Farebox Recovery” rate	na	18.5%	24.1%	29.1%	36.2%	38.8%
Sponsorship revenue	\$0	\$0	\$0	\$0	\$0	\$0
Public funds/grant revenue	\$0	\$0	\$0	\$0	\$0	\$0
Other revenue sources	\$0	\$0	\$0	\$0	\$0	\$0
<b>Revenue sub-total</b>	<b>\$0</b>	<b>\$60,000</b>	<b>\$78,000</b>	<b>\$157,000</b>	<b>\$195,000</b>	<b>\$209,000</b>
<b>Revenue Cumulative</b>	<b>\$0</b>	<b>\$60,000</b>	<b>\$138,000</b>	<b>\$295,001</b>	<b>\$490,001</b>	<b>\$699,001</b>
<b>CASH FLOW</b>						
Annual shortfall	-\$1,051,000	-\$255,820	-\$227,820	-\$1,064,280	-\$328,280	-\$307,280
<b>Cumulative shortfall</b>	<b>-\$1,051,000</b>	<b>-\$1,306,820</b>	<b>-\$1,534,640</b>	<b>-\$2,598,920</b>	<b>-\$2,927,200</b>	<b>-\$3,234,479</b>

**Table 13-1.2:** Five Year Financial Forecast for “low” and “high” cost equipment (15 stations Year 1-2 and 25 stations in years 3-5. Note that annual inflation were not factored into the costs above)



## Operational Issues

This chapter presents a number of operational characteristics that will need to be considered by the program administrator, the equipment vendor, and the operator. These include items such as maintaining appropriate service levels, reporting and insurance.

### Service Levels

Service levels are crucial for a well-operated bike share system. They determine the customer experience (e.g. bikes with maintenance issues, graffiti on stations, full or empty stations) and are heavily correlated to operating costs. For example, if an operator is required to check each bike each day, the system will be more expensive to operate than if they are required to check each bike each month.

There are some aspects of the service levels that will be dependent on funding. Specifically, if operations for the bike share system are supported by system revenues, the model could allow for a relaxation of some service levels if the system is generating less revenue than anticipated. This allows an operator to reduce its baseline costs to provide longer-term financial sustainability of the system. If the operations contract is fully-funded, then there is no need to scale service levels to revenues.

**The operator should also have a means to accurately record and report on all service levels, ideally through an electronic system.**

A typical set of service levels are assumed in the cost estimates. However, specific service levels will need to be determined during contract negotiations, and will likely include detailed definitions, service default penalties, and exceptions for *force majeure* events, such as tornadoes or earthquakes.

### Maintenance Plan

Stations should self-report problems through the software backend, and therefore will not need preventative maintenance checks. An accurate repair history should be maintained for each bike, with each one to undergo routine maintenance checks, e.g. bikes should be checked during station checks every two weeks and those not captured in that process should be “chased down” once every calendar month.

### Reporting

Data reporting and transparency is a key part of helping Columbia track and achieve its bike share system goals. A lot of useful data is reported directly from the system and others can be easily post-processed to track performance and predict activity.

### Insurance

There are several types of insurance typically required by cities for bike sharing, including liability, workers compensation, auto, etc. The contractor typically indemnifies related agencies, private property owners who host a station, and other stakeholders. Although this has not yet been mandated by cities, insurance that protects against *force majeure* is strongly recommended. So far, there have not been any insurance companies willing to provide insurance for theft and vandalism of bicycles. However, it is possible to find insurance that covers bikes while they are in stations or in storage. Cost estimates are based on industry insurance standards.





# System Equity Considerations

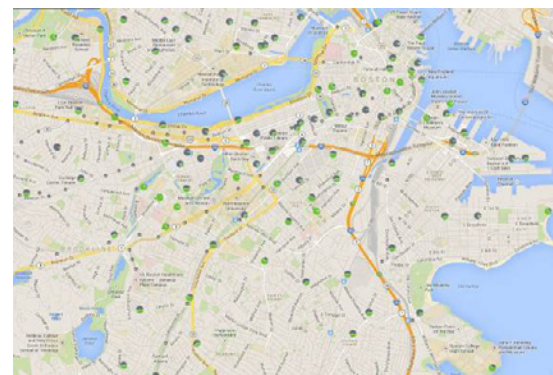
Bike share systems are gaining increased attention as a potential tool to address transportation equity issues that exist in cities. Bicycling has long been regarded as a method to address transportation access issues due to the low cost in comparison with car ownership (and even transit fares). Because many low-income neighborhoods also face health issues, active transportation modes like bike share can address multiple fronts.

Some of the challenges of providing bike sharing to lower income and traditionally under-served communities include barriers associated with encouraging bicycling in general such as a lack of access to bike facilities and typically less funding dedicated to pedestrian and cycling projects in these areas; as well as barriers to bike sharing such as typically lower densities with destinations tending to be more spread out, lower visitor activity (a critical driver of user revenues), and the need for a credit card to access the system.

It is critically important for the early stages of planning and marketing a bike share program include consideration of “system equity”. This is one of the key goals of the program in Columbia. Related to system equity, there are three key areas in which strategies can be developed to tackle this issue: **system planning**, **membership affordability** and **promotion**. The sections below explore some “best practices” from other US cities that have tried to promote membership, use and safety among lower-income and minority communities who have not historically embraced bike share in the same way that middle-upper income white populations have in other cities.

## System Planning

Many cities have recognized that in order for bike share to be appealing to low-income populations, stations must be placed in economically disadvantaged areas. Although these stations may not generate revenue consistent with downtown stations, stations in low-income areas ensure that bike share can become an affordable transportation option for the most vulnerable of populations.



*Hubway expanded its system in 2013 into historically underserved neighborhoods.*

### Greater Boston, MA Hubway

The Greater Boston Hubway Bikeshare system launched in the summer of 2011, and since its inception has steadily grown. Like most bike share systems, stations were initially concentrated in the retail and commercial centers of the host

cities. Although Boston is a majority minority City, the great majority (87%) of Hubway Members are white. Boston recognized the disparity between the demographic composition of the city and the primary users of Hubway, and in the summer of 2013, made a concerted effort to increase access for low-income and minority populations to the system. Efforts were undertaken to install stations in historically underserved neighborhoods. Out of the 20 station expansion that summer, 40% were located in low income areas. Since this rollout, the stations have generally seen less use than more centrally located stations. The lower usage rates of these stations are linked to the fact that the lower income areas of Boston tend to be on the periphery of the city, and the stations located in these areas do not receive as many pass through trips as more centrally located stations.

### Minneapolis, MN Nice Ride

The Minneapolis Nice Ride system launched in 2010. When the system launched, no stations were placed in Minneapolis’ Near North neighborhood, a historically diverse, low-income area of the city. The community was disappointed with the lack of access to the system, and expressed this concern to the city and Nice Ride organizers. Three stations were installed in Near North as a result of this frustration, and in 2011, the Minneapolis Health Department funded a grant to further expand the system into the neighborhood with the hope that physical activity among residents would increase.

A yearlong community engagement process preceded the installation of stations in Near North to gauge the level of interest in bike sharing, and to determine ideal station locations. Nice Ride hired a staff person that spent a portion of their time leading the public outreach efforts. The engagement process was multifaceted, including: community meetings; strategic partnerships with local businesses, non-profits, and community leaders; marketing efforts including fliers and postcards; and focus groups composed of different community interest groups. Through the public outreach, it became evident that bike share was viewed as a positive amenity. Also, the process resulted in several recommendations for station placements that would best serve residents’ needs. In 2011, 8 new stations were installed in Near North, bringing the total in the neighborhood to 11 stations.

Prior to the installation of the additional stations, Near North residents used Nice Ride much less frequently than other areas of the city. After the expansion, the use of bike share by Near North residents remained low, and trips to or from the



*Nice ride expanded into the diverse Near North neighborhood through a partnership with the Minneapolis Health Department*



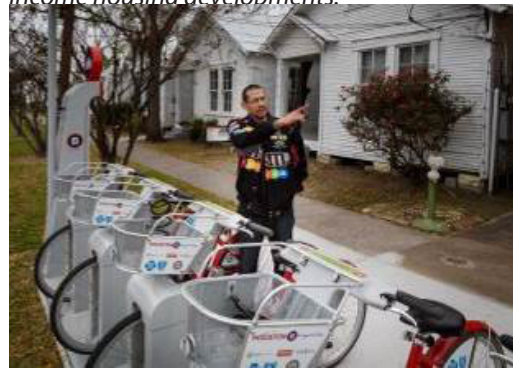
new stations comprised a very small percentage of all Nice Ride trips (2.2%). Of those trips, only 22% were taken by North Minneapolis residents, a statistical area that includes the Near North neighborhood.

After the stations were installed, promotion of bike share and engagement with the Near North community did not continue, mainly due to the fact that the grant funds were to be used to educate residents about bike share and install stations. Had engagement continued after the stations were installed, bike share may have become more popular in the community. Also, the data was limited to one year (2011), and perhaps low-income communities take longer than other areas to adopt bike share as a preferred mode of transportation. Additional years of data may have shown that use of bike share in Near North increased over time.

### Houston, TX B-Cycle

Houston's B-Cycle system launched in 2012, and the system evolved from the downtown hub of Houston into surrounding neighborhoods with a mix of incomes and demographics. Recognizing the importance of installing stations located near low-income residents, the 29<sup>th</sup> station in the system was located at a public housing development called Clayton homes, where residents have low-levels of car ownership and lack access to other modes of transportation. The station was funded by a \$25,000 contribution from the Coca-Cola foundation. In Houston, bikes can be checked out for 1 hour, 30 minutes longer than most US bike share systems. The longer rental time for bikes provides people with more time to get to and from destinations. Low-income populations, many of whom cannot afford

*Houston B-Cycle installed stations near low-income housing developments.*



vehicles, typically face long travel times than people with access to cars, and this longer rental time-frame could make bike share more appealing to disadvantaged populations.

### Washington, DC

Capital Bike Share launched in 2010, and until New York's Citi Bike launched in 2013, it was the nation's largest system. CaBi, as the system is known colloquially, has over 300 stations across four jurisdictions, including Washington,

D.C.; Arlington County, Virginia; the city of Alexandria, Virginia; and Montgomery County, Maryland. Like other Bike Share systems, the majority of Cabi users are white (80%), well-educated, and affluent. The jurisdictions that host the system have each made concentrated efforts to increase the percentage of minority and low-income bike share users to better reflect the demographic composition of the region. In the District, which hosts about 200 stations, stations are located in some of the city's poorest wards. Montgomery County, the most recent jurisdiction that Cabi has expanded into, received federal funds to install stations in Rockville and Shady Grove, which have within them concentrations of low-income populations.

The stations that have been installed in these areas have the lowest usage rates in the County.

### Philadelphia, PA

Advocates in Philadelphia have been working for years to bring bike share to the city, and the system is expected to launch in Spring 2015. In addition to using city and federal funds to install and operate the system, a \$3 million grant from the JBP Foundation was obtained to ensure the bike share system catered to the city's low-income residents. Most bike share systems have located their first wave of stations in downtown, high-rent parts of their city's areas that were expected to have the demographic and economic characteristics necessary to support bike share. A possible result of this station rollout strategy has been that bike-sharing systems nationwide tend to be primarily used by wealthier, white populations. Rather than follow this trajectory, the Philadelphia bike share system will use the recently obtained grant funds to locate stations in low-income neighborhoods from the system's onset. Programs are also being developed to engage residents in disadvantaged areas where stations are planned.



## Membership Affordability

In addition to planning stations in low-income neighborhoods, several cities have implemented programs to ensure that bike share memberships are affordable to all residents. Due to the high cost of bike share bikes (about \$2000 ea.), cities require that a hold be placed on users' credit cards for liability purposes. The requirement for a user to have a credit card has served as a barrier for people who do not have credit cards or bank accounts, a group of people known as the 'unbanked'. Low-income populations are more likely to not have a credit card than higher-income populations, and therefore this barrier has been cited as a factor in decreasing the adoption rate of bike share among disadvantaged populations. In order to overcome this issue, many cities have instituted programs that provide an alternative means for the unbanked to access bike share. Additionally, cities have provided subsidized or free memberships to people who meet certain eligibility requirements based upon their income. The list below highlights programs that have been implemented to ensure bike share is an equitable transportation option in different cities around the country.

### Denver/Boulder, CO

- B-Cycle has offered memberships directly to residents of low-income housing developments. In one instance, 100 memberships were made available to one housing development. Of the 100 memberships, 32 people opted to sign up for one, and 23 rode the bikes more than once after they became members.

### Greater Boston, MA

- A partnership with the Boston Public Health Commission has provided the Boston branch of Hubway with the opportunity to sell \$5 subsidized memberships to disadvantaged residents. The city opted to not make memberships free so that subsidized members would place a value on their memberships. In addition to a membership, free helmets are also provided to subsidized users. If a resident meets any of the below requirements, they are eligible for the program (<http://www.bostonbikes.org/programs/subsidized-hubway-memberships>):
  - They are low income (based on family size; 400% below poverty line).
  - They receive any type of public assistance
  - They live in low-income housing



*Boston Bikes, the bike planning arm of Boston's city government, has developed several programs to expand access of bike share to low income residents.*

The program has performed better than expected. As of 2014, 11% of Boston Hubway members were subsidized. There was no significant difference between trips taken by subsidized members when compared to full-pay members.

- Subsidized members can check bikes out of the system for 1 hour at a time, which reduces the risk of incurring overage charges (full pay members must comply with a 30 minute rental limit).
- An unadvertised cash option is available for low-income residents, so that those without credit cards can purchase a membership. Also, residents can sign up to become members at the Boston Bikes office, as well as at membership drives, allowing offline alternatives to becoming members.



- The Boston Medical Center has a pilot program called “Prescribe a Bike” for low-income individuals with health-related issues that care providers believe can be addressed, in part, by moderate exercise. The program allows physicians to literally prescribe Hubway membership at no cost to the patient.

### Washington, DC

- In the District, the operator works with Bank On DC, an organization that seeks to provide financial education and services to unbanked families and individuals. Reduced price memberships are provided to Bank On DC account holders.
- The District has partnered with a local-non profit Back on my Feet to provide free memberships to homeless people so that they can get to job training and interviews. Since 2014, 15 memberships have been distributed through the program.
- Montgomery County has used a federal grant to provide 200 memberships for low-income residents that qualify. Of the 200 memberships offered in the first cycle, 20 residents took advantage of the free memberships.

### Minneapolis, MN

- The organizers of Nice Ride offered discounted \$20 memberships (at the time full price memberships were \$60) for a period when new stations were being installed in the Near North neighborhood, a low-income area of the city. The organizers used a staffer to canvas the area promoting bike share and sell the discounted memberships.
- Although users still need a credit card to use a bike, Nice Ride no longer requires that a hold be placed on a person’s credit card while they use the bike. This has eliminated the need to have a few hundred dollars on a person’s credit card be inaccessible when they use the bikes, potentially removing a barrier of entry to low-income residents concerned about having access to their financial resources (<https://www.niceridemn.org/faq/>)

### Houston, TX

- A Bicycle Helmet fund is used to provide helmets to very low income residents (<http://www.chron.com/opinion/editorials/article/Bike-class-and-the-poor-4592176.php>)

### Philadelphia, PA

- Philadelphia bike share will be the nation’s first bike share system to allow users to check out bikes without a credit card. A prepaid card will be offered to low-income residents so that they can use the system even if they don’t have a credit card. Logistics of this program are still being sorted out in the lead up to the Spring 2015 system launch (<http://planphilly.com/articles/2014/04/25/bike-share-behind-schedule-but-will-be-accessible-without-credit-card>).



*The District has partnered with the non-profit Bank on DC to provide memberships to ‘unbanked’ low-income residents, or those that do not have access to a credit card or bank account.*



## New York City

- Citi Bike offers all New York City Housing Authority (NYCHA) residents as well as members of select New York City Community Development Credit Unions (CDCUs) a reduced \$60 membership – a \$35 discount off the full-price membership (<https://www.citibikenyc.com/pricing/discounted>).

## Promoting Bike Share

Placing stations and providing memberships are steps in the right direction, but continued bike share outreach and education is necessary to ensure the adoption of bike share by low-income populations. To understand how bike share works, and what its benefits are, takes time and a commitment by a person to want to learn the logistics of how the system operates. Cities can help target populations to learn about bike share and start using it through a variety of methods, some of which are outlined by city below:

- **New York City, Citi Bike:** Significant outreach to low income and non-English speaking populations has been conducted prior to the launch of Citi Bike to increase awareness of the system and station locations, distribute bicycling safety resources (such as helmets), and provide information on registration and assisted payment options.
- **Greater Washington, DC, CaBi** – The host communities of Capital Bike Share have spearheaded many efforts to promote bike share to low income populations. Montgomery County, one of the jurisdictions where CaBi operates, has sent county staffers into the community to educate residents about bike share, as well as placed ads on Ride on Buses and published brochures in English and Spanish. In Arlington, pamphlets have been distributed in English and Spanish to inform residents that bike share is a low-cost transportation option. Residents of Arlington now have the option to join CaBi at one of Arlington’s four commuter stores, allowing those without internet access to join the system.
- **Greater Boston, MA, Hubway** - The City of Boston has been successful in advertising the benefits of bike share as a low-cost transportation option to low-income residents of the city. The city has used a combination of public outreach efforts directed at economically disadvantaged populations, including giving fliers to non-profits and posting fliers online, using local media sources to promote the system, locating informative posters at stations, and conducting presentations directly to target populations.

In many cities, bike share managers frequently show diverse images of bike share users in promotional materials and advertising. This can help promote inclusiveness and improve the image of bike share within communities of color.

**¡citi bike ya está aquí!**

Una manera nueva y fácil de aprovechar la ciudad de Nueva York (NYC) al máximo. Citi Bike es el sistema de bicicletas compartidas de Nueva York, que pone a su disposición miles de bicicletas las 24 horas del día y los 7 días de la semana. Las bicicletas de Citi Bike se encuentran en cientos de estaciones de autoservicio en Manhattan y Brooklyn, y son perfectas para recorridos cortos por la ciudad.

**1 INSCRÍBASE**  
Adquiera un pase de 24 horas o de 7 días en cualquier estación de Citi Bike o inscribese para obtener una clave de membresía anual en [citibikenyc.com](http://citibikenyc.com).

**2 DESBLOQUEE**  
Desbloquee la bicicleta con su código de recorrido o su clave de membresía. Acceso las 24 horas del día y los 7 días de la semana a 6000 bicicletas en más de 300 estaciones en Brooklyn y Manhattan.

**3 INICIE EL RECORRIDO**  
¡Vaya en bicicleta cuando lo desee! Su membresía o pase de acceso incluyen recorridos cortos limitados.

**4 DEVUELVA**  
Devuelva la bicicleta en cualquier estación de Citi Bike. Úsela cuantas veces quiera durante el tiempo de vigencia del pase o de la membresía sin costo adicional.

*Citi Bike in New York City has distributed fliers in several languages, including Spanish, so that all the city's residents can learn about how to use the bike sharing system.*



## Summary of Equity Strategies

Planning bike share in low-income communities requires a stepped approach that begins with promotion and engagement, then involves station placement and membership affordability programs, and then is followed up by continued promotion and engagement. The graphic below illustrates this flow:

# PLANNING BIKE SHARE IN LOW-INCOME COMMUNITIES

