

# ST LOUIS BIKE SHARE STUDY



# Acknowledgements

Successful projects typically begin by asking one key question: “should we proceed with this idea?” The St. Louis Bike Share Feasibility Study has been a cooperative effort to do just that; could bike share be successful in the places where we live, work, learn and play? Great Rivers Greenway District and the consultant team gratefully acknowledge and appreciate the members of the Technical Advisory Committee and the Citizen and Business Advisory Committee who shared both time and expertise to help us evaluate this question.

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# 1. Overview

Dozens of cities throughout North America recognize the health, environmental, and economic benefits of bike sharing. The St. Louis region has many of the necessary characteristics required to make bike sharing successful and continue its development as a bike-friendly community. This Study presents a feasibility analysis for a bike share program in the region and outlines a business plan for its creation. It indicates the proposed system size and phasing; recommends 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; presents a series of best practices to ensure system equity; and outlines an implementation plan to launch bike share in 2016 or early 2017.

The intent of the initial section of this report is to explain bike share—what it is and the benefits it could bring—and assess existing conditions to ultimately determine its feasibility. It compares and contrasts 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 and economic enhancements that may be needed within the City of St. Louis and St. Louis County.



*Hubway bike share system in Boston*

It is important to note that the recommendations in this study were developed after robust input from project partners, a Technical Advisory Committee, a Citizen/Business Advisory Committee and residents of the region. The latter was achieved through a series of public open houses, focus group meetings and outreach at various community events such as farmer's markets, Bike to Work day and the Earth Day celebration in Forest Park. The team also promoted input through a pair of surveys which asked respondents about their top goals for a bike share system, whether they would use it, how much they would pay, and the barriers that would need to be mitigated for bike share to become a serious transportation option within their routines. In all, a total of nearly 1500 people responded to the survey, both on-line and on paper.

## 2. What is bike share?

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

Bike share systems are typically structured to operate like automated bike rental for short periods. The structure encourages shorter, spontaneous trips whereby bikes are checked out, ridden for a short period of time (typically 30 minutes or less) and returned to any station in the system for 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.



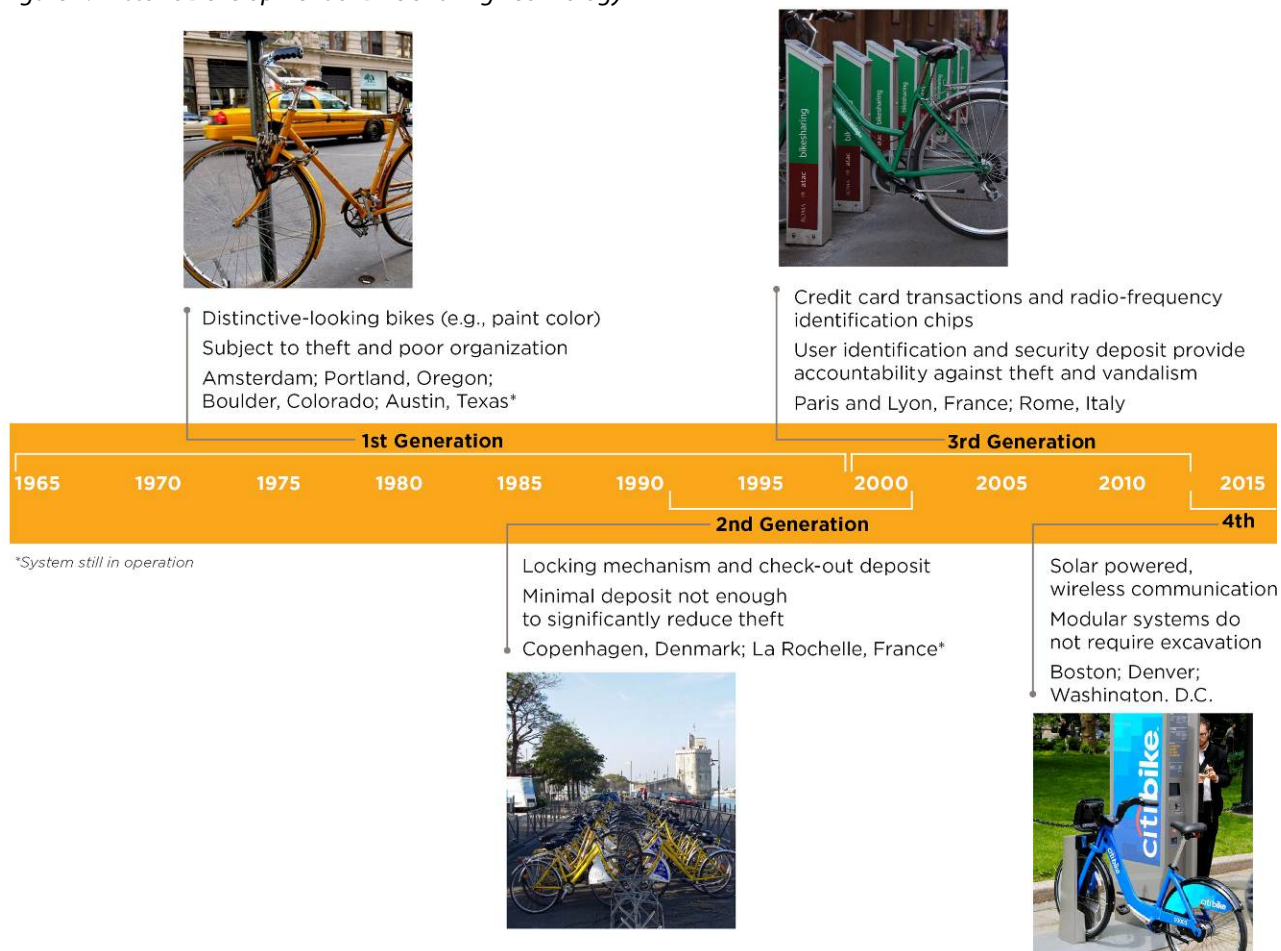
Figure 1: Current North American bike share systems with at minimum 50 bicycle fleet

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 mainstream form of travel 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, it has been around for more than 40 years. Figure 2 tracks the historic development of bike share system technology.

Figure 2: Historic Development of Bike Sharing Technology



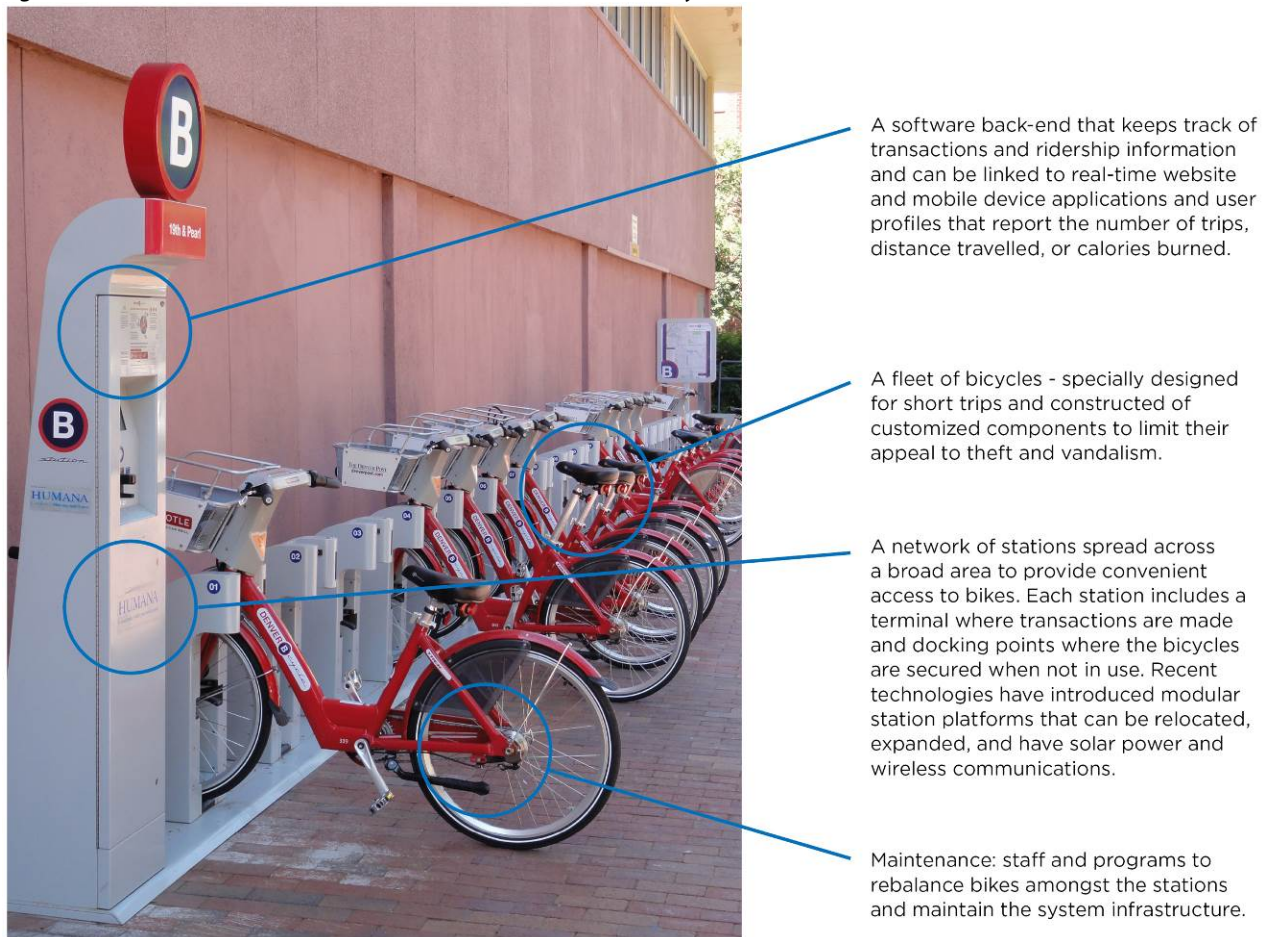
Most of the 1<sup>st</sup> generation “systems” were volunteer-led and informally organized. These programs experienced low to moderate success because of theft, vandalism, inefficient technology and insufficient operational oversight. Second generation programs arose in only a few cities in the 1990’s and required a coin deposit to release a bike shackled to a specially-designed rack. These never caught on however, and suffered from high levels of theft because a thief suffered the loss of only a coin deposit, worth only a few dollars in most of the European countries.

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. Third generation systems developed initially in France in the early 2000’s were a breakthrough for bike share because of the well-designed bikes and stations and the accountability built into the systems.



Fourth generation systems are the most recent bike share technologies and were developed in North America. They are modular systems that do not require excavation because they use solar power and wireless communication, as opposed to sidewalk or roadway-mounted and hardwiring found in the European 3<sup>rd</sup> generation systems. 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. Due to the advantages of the 4<sup>th</sup> generation technology, no 3<sup>rd</sup> generation systems have been installed in North America.

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



Bike share technology is evolving quickly along with other wireless and digital changes. Other recent advancements include systems that do not require steel-plate based docking stations (so-called “smart lock” systems) and electric-assist bikes, the latter of which has not been proven at a city-wide scale. Several “smart lock” systems are in pilot phases and have been launched in 2014 in Phoenix and Tampa. The launching of four or five more smart lock systems are expected to be launched in 2015, as well. If shown to be successful, the smart lock system could offer a very respectable alternative at a lower capital cost than dock-based systems. The built-in GPS systems also allow flexibility with regards to pricing as fees—if any—can be charged based on where someone parks the free-floating, smart lock bike, or no fee if parked at the designated parking hub. In aggregate, all technology options have been explored as part of this study. 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 4: Elements of a 4<sup>th</sup> Generation Stationless Bike Share System



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)

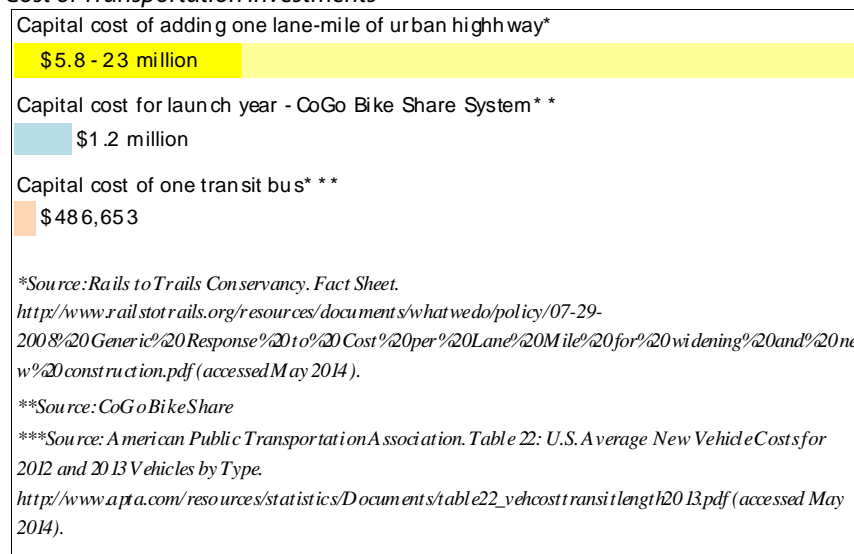
### 3. Benefits of Bike Share

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 infrastructure, such as public transit and highways.

Figure 5: Relative Cost of Transportation Investments



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
  - Customer services
  - Marketing
  - Community partnerships

Currently, there is a spectrum of funding (Table 1) 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 systems 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.

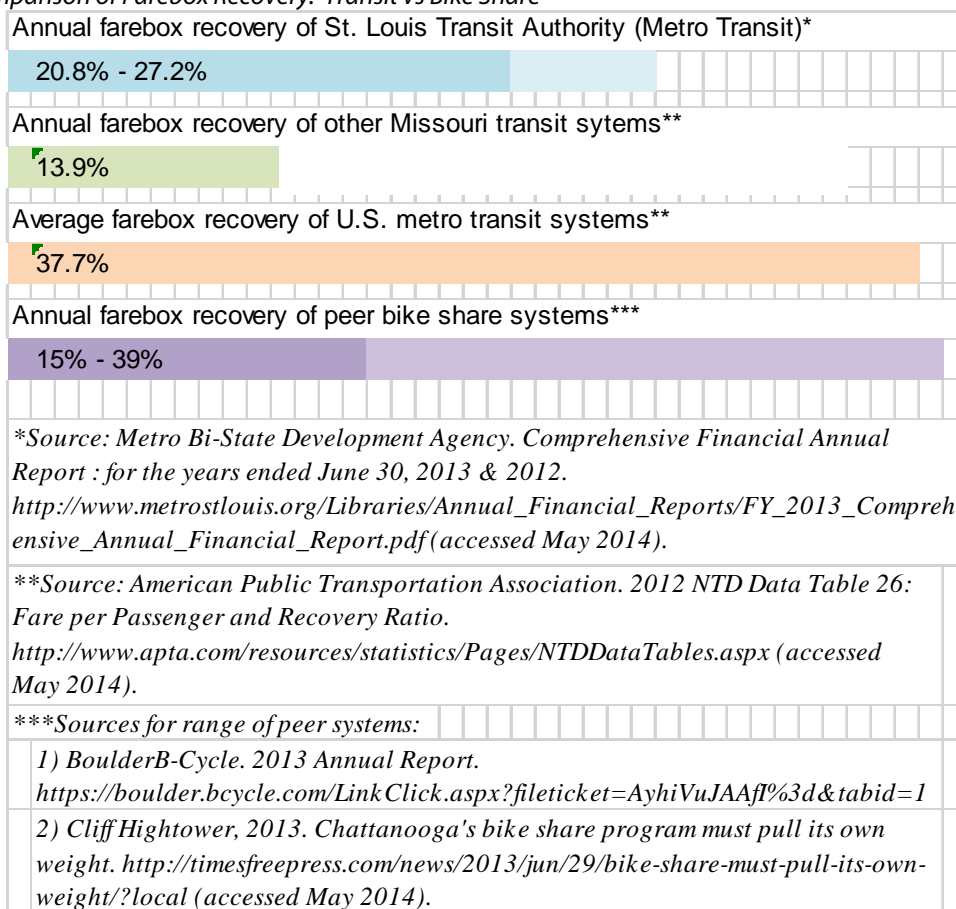
*Table 1: Bike Share System Funding Models*

City	System Name	Funding Model
Chicago, IL	Divvy	\$18 million federal funds; \$4.5 million local (TIF revenue, General Obligation bonds and Board of Aldermen funds)
Columbus, OH	CoGo Bike Share	\$2.3 million public investment in City's Capital budget; \$1.25 million/5 year sponsorship by Medical Mutual for operations
Denver, CO	Denver B-Cycle	Democratic Party Convention funds used, along w/ Kaiser Permanente. Also have several community sponsors.
Greater Boston, MA	Hubway	\$3.0 million in Federal Transit Administration grants, plus sponsorship money
Kansas City, MO	Kansas City B-Cycle	100% Private funding
Madison, WI	Madison B-Cycle	\$1 million in-kind support from Trek (B-Cycle's parent company)
Miami Beach, FL	DecoBike	100% Private funding
Phoenix, AZ	Gr:d Bike Share	Public-private partnership seeking corporate partners (launched in November 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%. In St. Louis, average farebox recovery ranges from 20.8% for buses to 27.2% for MetroLink, and the state-wide average farebox recovery is roughly 13.9% in Missouri. 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.

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



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:

- **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)
- **Create jobs.** 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.
- **Improve access to businesses.** 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. An early 2014 survey of Salt Lake City’s GREENbike users indicated that 85% felt more likely to shop at businesses near bike share stations.
- **Provide space for brand development for local businesses.** Depending on the technology and operating model for a system, space could be provided for sponsorship. Companies and property developers can also provide it as a positive community amenity for employees or tenants.
- **Reduce transportation costs for household budgets.** In some cases, bike share can eliminate the need for an extra vehicle.

Table 2: Job Creation from Bike Sharing Services

Program	Stations	Bikes	Full Time Employees	Part Time Employees*
Chicago, IL	300	3,000	16	79
Columbus, OH	30	300	3	3
Denver, CO	83	709	14	18

*\*Part-time includes part-time employees and seasonal employees*

Bicycling, and in particular bike share, is an affordable form of transportation relative to other options. The cost of using a bike share bike for a year can be as low as the annual membership fee, which is typically between \$65 and \$80 per year for similar cities, compared to \$6,000 for annual ownership and operation of a personal vehicle or \$408 for an annual transit pass. Figure 7 compares the annual user costs for various transportation modes available in St. Louis.

Figure 7: Annual User Cost for Various Transportation Modes

Ownership and operation of personal vehicle*	\$6,058
Enterprise car sharing in St. Louis (rent for one hour 365 days per year)**	\$2,920
St. Louis Metro Transit Pass (purchase 12 monthly passes)***	\$936
Bike Share Membership****	\$65-85

\*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.  
[http://www.rita.dot.gov/bts/sites/rita.dot.gov/bts/files/publications/national\\_transportation\\_statistics/html/table\\_03\\_17.html](http://www.rita.dot.gov/bts/sites/rita.dot.gov/bts/files/publications/national_transportation_statistics/html/table_03_17.html) (accessed May 2014).

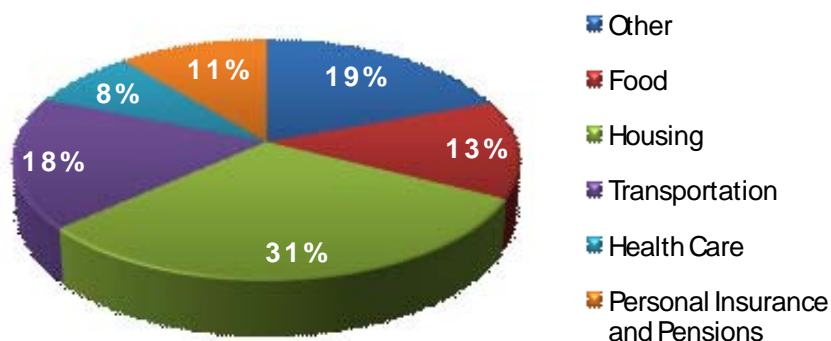
\*\*Source: Enterprise CarShare. Washington University.  
<http://www.enterprisecarshare.com/car-sharing/program/washu>. (accessed May 2014).

\*\*\*Source: Metro Transit – St. Louis. Fare Chart.  
<http://www.metrostlouis.org/FaresPasses/FareChart.aspx> (accessed May 2014).

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

Additionally, 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 (Figure 8), residents in the Midwestern U.S. spent an estimated 18% of their household budget on transportation in 2012. The lower cost to use bike share compared to other transportation modes in St. Louis could potentially reduce the amount a household spends on transportation by reducing the need to use a car for some trips. In cities with bike share systems, there is at least an opportunity to reduce costs quite significantly, if one could forego ownership of a car and rely instead on bike share, transit and, perhaps, car share. In Washington, DC, 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 8: Household Spending on Transportation in Midwest 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 propelled by a number of agency and community initiatives as a goal, such as:

- Trailnet's Healthy, Active and Vibrant Communities and Shift Your Commute programs
- Citizens for Modern Transit's Ten Toes Express Program
- City of St. Louis' Sustainability Action Agenda includes an obesity reduction goal
- Girls on the Run of St. Louis' running programs that empower girls from 3rd to 8th grade for a lifetime of healthy living

In Missouri, levels of obesity and physical inactivity are both significant public health issues. As of 2012, Missouri has the seventeenth highest rate of obesity levels *per capita* in the country (Figure 9). The Centers for Disease Control reported that in 2010, 30.5% of adults in Missouri were obese, and an even higher number, 65.2%, were overweight.<sup>1</sup>

Twenty-six percent of Missouri adults surveyed reported that, during the past month, they had not participated in any physical activity. The recommended amount of physical activity for adults is 20-30 minutes of moderate physical activity each day. Because average bike



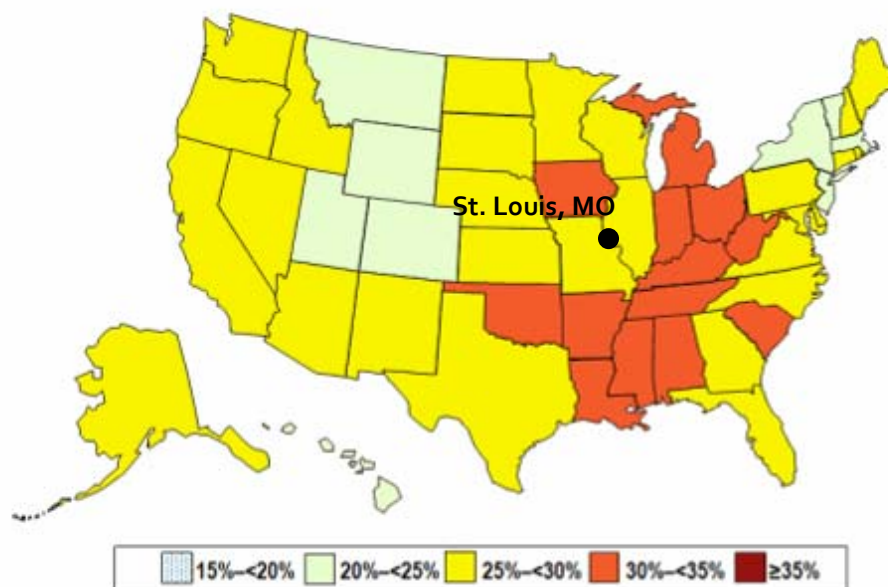
*In this rendering of a proposed bike share station at the Steinberg Rink, and other sites in Forest Park, will promote active transportation and benefit public health for St. Louis residents*

<sup>1</sup> <http://www.cdc.gov/obesity/stateprograms/fundedstates/pdf/missouri-state-profile.pdf>



share trips are just over one mile at relatively slow speeds, the typical 20 minute trip can help people get this needed physical activity as part of their daily commute or travel pattern. Bike share stations placed within or near prominent parks, greenways and trails can also promote longer, recreational trips that additionally promote active lifestyles and public health.

Figure 9: 2012 Self-Reported Obesity Prevalence among U.S. Adults\*



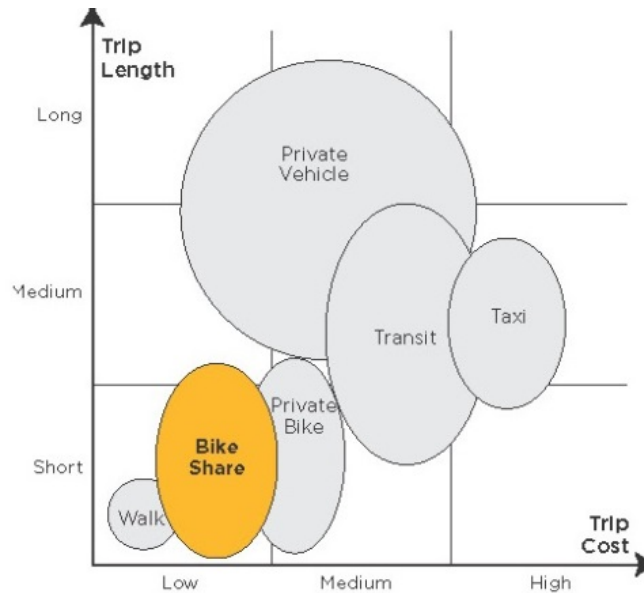
\*Source: Center for Disease Control and Prevention. Behavioral Risk Factor Surveillance System, 2012.  
<http://www.cdc.gov/obesity/data/adult.html> (accessed May 2014).

In addition to personal health, several health care providers have recognized the benefits of bike share. Health care providers such as Kaiser Permanente, Medical Mutual, Blue Cross Blue Shield and Humana have provided sponsorship or other financial support for bike share systems. Some systems sponsored by health care providers 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.

## 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.

Figure 10: Diagram showing estimated travel modes based on trip length and cost (source: Alta)



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 high-investment transit options, such as light rail.
- **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.

In St. Louis, walking, biking and use of public transportation are above the national average. This is a good metric for bike share. Bike share can help increase cycling rates to work and also expand the geographic coverage for transit riders. Table 3 highlights the commute rates for walking, bicycling and public transportation relative to other travel options and compared to state and national rates.

Table 3: Walking, Biking and Transit commute rates

Commute	U.S.	Missouri	City of St. Louis
Car, truck, or van	86.1%	91.1%	80.8%
Public transportation (excluding taxicab)	5.0%	1.4%	9.4%
Bicycle	0.6%	0.2%	0.8%
Walked	2.8%	2.0%	4.6%
Taxicab, motorcycle, or other means	1.2%	1.0%	1.2%
Worked at home	4.3%	4.3%	3.2%

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, a few serious injuries and one fatality have been reported. In Washington, DC, a total of 14 crashes were reported in the first year of operation, of which 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. As of November 2014, Citi Bike in New York City has had over 12 million trips without a single fatality and less than 50 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 Features of a Typical Bike Share Bicycle (DecoBike, Miami Beach)**





## 4. Bike Share System Comparison

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 varying generations of technology, varying fee structures, funding strategies and operational models.

The matrix on the subsequent page provides an overview of each of the following systems:

- Chicago, IL
- Columbus, OH
- Denver, CO
- Greater Boston, MA
- Kansas City, MO
- Madison, WI
- Miami Beach, FL
- Phoenix, AZ

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 Phoenix has only recently become operational so data has yet to become available. However, it was chosen to highlight one of the few city-wide applications of a stationless, “smart lock” system that does not rely on relatively-expensive docking units. Although untested at a city-wide scale, the stationless system offers the potential benefit of lower capital costs and the ability to park and retrieve a bike anywhere in the service area.

The intent of the comparison matrix (Table 4) is to provide a snapshot of a variety of systems within cities that relate to St. Louis’s city population, geographic proximity and/or the physical character. It also provides a baseline and a high-bar for a potential bike share program in greater St. Louis with regards to system size, user and system costs, funding options, ownership models and the variety of equipment vendors and operators.

Table 4: System Comparison Matrix

CITY	SYSTEM CHARACTE RISTICS								BUSINESS MODEL						CURRENT DATA	
	System Name	Equipment Type/Vendor	City(ies) Population (2012)	Launch Date	Number of bikes at launch	Current Number of bikes	Current Service Area	Seasonal vs. Annual	Funding	Ownership Structure	Operator	User Cost (Member)	User Cost (Casual User)	User Access Method	Number of Members	Number of Trips
Chicago, IL	Divvy	Public Bike Share Company	2,715,000	June 2013	650 (65 stations)	3,000 (300 stations; with 175 stations planned for 2015)	Chicago	Annual	\$18 million federal funds; \$4.5 million local (TIF, General Obligation bonds and Board of Alderman funds)	Chicago Dept. of Transportation (CDOT)	Private vendor: Alta Bicycle Share	\$75 - annual	\$7 - 24-hour pass	Member: pay online or at kiosk; provided key to unlock bike from dock. Casual: buy pass at kiosk or online; given code to type into keypad at bike dock.	17,560 annual (as of June 1, 2014)	750,000 in 2013; 1.2 million cumulative
Columbus, OH	CoGo Bike Share	Public Bike Share Company	809,798	July 2013	220 (30 stations)	220 (30 stations)	Columbus	Annual	\$2.3 million public investment in City's Capital budget; \$1.25m/5 year sponsorship by Medical Mutual	City of Columbus	Private vendor: Alta Bicycle Share	\$75 - annual	\$6 - 24-hour pass	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.	700 annual; 6,000 day passes (as of June 1, 2014)	31,000 in 2013; 42,000 cumulative
Denver, CO	Denver B-Cycle	B-Cycle	634,265	April 2010	800 (80 stations)	709 (83 stations)	Denver	Annual	Democratic Party Convention funds used, along w/ Kaiser Permanente. Also have several community sponsors	Nonprofit (Denver Bike Sharing)	Nonprofit: Denver Bike Sharing	\$80 - annual \$30 - 30-days \$20 - 7-days	\$8 - 24-hour pass	Member and Casual Users: purchase online. Only 24-hour pass can be purchased at kiosk using debit/credit card. Annual members mailed B-card to unlock bike from dock. All other access pass durations unlock bike using kiosk (must swipe same card used to purchase pass)	4,023 annual; 51,153 day passes (as of end of 2013)	2010 - 102,981; 2011 - 202,731; 2013 - 263,110
Greater Boston, MA	Hubway	Public Bike Share Company	878,786	July 2011 (Boston only)	600 (60 stations)	1,300 (140 stations)	Boston, Brookline, Cambridge and Somerville	Seasonal: Boston, Brookline, and Somerville Annual: Cambridge	\$3.0 million in Federal Transit Administration grants, plus sponsorship money	Individual cities own their own stations and bikes	Private vendor: Alta Bicycle Share	\$85 - annual \$20 - monthly	\$6 - 24-hour pass \$12 - 72-hr pass	Member: pay online or at kiosk; provided key to unlock bike from dock. Casual: pay at kiosk and receive code to unlock bikes.	11,100 annual; 2,000 monthly; 25,500 day passes (as of June 1, 2014)	>1.8 million cumulative

Kansas City, MO	Kansas City B-Cycle	B-Cycle	464,310	July 2012	90 (12 stations)	90 (12 stations)	Kansas City	Annual	Private funding (100%)	Nonprofit (Bike Share KC)	Nonprofit: Bike Share KC	\$65 - annual \$25 - 30-days \$15 - 7-days	\$7 - 24-hour pass	Member: purchase online; unlock bike from dock using B-card or unlock using kiosk. Casual: purchase and unlock bike from kiosk.	300 annual; 5,000 day passes (as of June 1, 2014)	5,300 rides taken in 2012 inaugural year
Madison, WI	Madison B-Cycle	B-Cycle	240,323	May 2011	230 (24 stations)	350 (35 stations)	Madison	Seasonal	\$1 million in-kind support from B-Cycle	City of Madison	Nonprofit: Madison Bike Share	\$65 - annual \$7.99 - monthly \$5 - 24-hour	\$5 - 24-hour pass	Annual/monthly: purchase online. Casual (24-hr): purchase online or at B-station kiosk. Unlock using B-card or at kiosk.	2011 - 475; 2012 - 2,150; 2013 - 1,843 annual; 2011 - 5,965; 2012 - 11,710; 2013 - 15,367 day passes	Total trips: 2011 - 18,501; 2012 - 63,325; 2013 - 81,662 (304 average checkouts/day in 2013). Overall total 2011-2013 = 163,488 trips
Miami Beach, FL	Deco Bike	Sandvault	100,416	March 2011	1,000 (100 stations)	~1,000 (100+ stations)	Miami Beach, Surfside, and Bay Harbor Island	Annual	100% Private funding	Private: DecoBike	Private: DecoBike	\$25 - monthly for unlimited 60-min rides \$15 - monthly for unlimited 30-min rides Minimum 3-month membership	\$4 - 30-min access pass; \$6 - 60 min access pass; \$18 - 4 hour access pass; \$24 - 1-day access pass; \$35 - 30 trips in a month	Swipe credit card or DecoBike BeachPASS membership card at kiosk and follow instructions to unlock bike.	2,500 annual; 338,838 day passes (per 2012 Federal Highway Administration report)	3,020,486 as of Sept 30, 2013 ( <a href="http://www.decobikellc.com/case-study/">http://www.decobikellc.com/case-study/</a> )
Phoenix, AZ	Gr:d Bike Share	Social Bicycles (SoBi)	2,107,926	November 2014 in Phoenix ; 2015 in Tempe	1,000 (100 stations planned)	N/A	Phoenix, Tempe, and Mesa	Annual	Public-private partnership (seeking corporate partners)	City of Phoenix	Private: CycleHop	\$79 - annual \$30 - monthly	\$5 - 24-hour pass	Exact plan TBD - buy online or at kiosk	N/A; (very recent system)	N/A; (very recent system)

## 5. Program Goals

The development of goals for St. Louis' bike share program are intended to help city/regional leaders and key stakeholders **measure success** and help **secure the necessary funding** for capital, deployment and operations. The goals were also used to 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, etc.)
- Level of corporate/institutional support and sponsorship

While all are legitimate performance measures, every individual community establishes its own goals in order to determine whether a bike share program has been a successful addition to the transportation system.

**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 St. Louis 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 St. Louis visitors or 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 St. Louis and Forest Park 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 transit would lead to a more-dispersed system plan covering a larger service area.

For the St. Louis Bike Share Study effort, the system goals that were considered include:

1. Enhance the public transit network
2. Increase the number and safety of bicyclists on the street
3. Use bike share to leverage more bike infrastructure
4. Improve St. Louis' image and attract new residents and businesses
5. Improve air quality and reduce motor vehicle traffic



6. Increase physical activity to benefit public health
7. Promote travel to landmarks, parks, trails and shopping districts
8. Increase access to job opportunities and education
9. Expand mobility options for low-income neighborhoods
10. Serve visitors and tourists to maximize revenue

To prioritize the goals, opinions were sought from stakeholders representing the City of St. Louis, St. Louis County, Metro and key institutional, business and community leaders of the St. Louis region. Details of the prioritization effort are outlined in Section 6.

## 6. Stakeholder and Public Engagement

The study effort was comprised of multiple public and stakeholder engagement strategies to inform residents about bike sharing and to solicit feedback about the feasibility of bike sharing in St. Louis. The engagement process began in March 2014 with the launch of a project website and the formation of two committees – the Technical Advisory Committee (TAC) and the Citizen/Business Advisory Committee (C/BAC). The engagement plan also included two on-line surveys, an interactive web-based station mapping tool, two public open houses, a potential partners' briefing, a bike shop owners briefing, two focus groups and several appearances at music festivals, bike races and farmer's markets. The chronological schedule of engagement activities is below.



*Community members at a bike share open house*

*Table 5: Schedule of Engagement Activities*

Date	Engagement Activity
April	<ul style="list-style-type: none"> <li>• Launched website</li> <li>• Launched goals survey until May 31</li> <li>• Tabled at Earth Day Festival</li> </ul>
May	<ul style="list-style-type: none"> <li>• Conducted TAC and CBAC meetings and public open houses Downtown and in the Forest Park Visitor's Center</li> <li>• Tabled at National Bike to Work Day at St. Louis City Hall and at the Missouri History Museum in Forest Park</li> </ul>
June	<ul style="list-style-type: none"> <li>• Conducted TAC and CBAC meetings</li> </ul>
July	<ul style="list-style-type: none"> <li>• Tabled at St. Louis Place Park concert</li> <li>• Launched bike share usage survey until September 2</li> </ul>
August	<ul style="list-style-type: none"> <li>• Conducted TAC and CBAC meetings</li> <li>• Conducted focus groups with residents from Renaissance Grand and North Sarah McCormack Baron properties</li> <li>• Tabled at various events, including Tower Grove Farmer's Market, Old North Farmer's Market, Lafayette Square Gateway Cup and Moonlight Ramble</li> </ul>
September	<ul style="list-style-type: none"> <li>• Conducted TAC and CBAC meetings</li> </ul>
October	<ul style="list-style-type: none"> <li>• Conducted potential partners briefing</li> </ul>
November	<ul style="list-style-type: none"> <li>• Conducted bike shop owners briefing</li> <li>• Conducted public open house at the Schlafly Library in the Central West End</li> </ul>

## Advisory Committees

To provide timely feedback to the consulting team, the Technical Advisory and Citizen and Business Advisory Committees (for list of participants, see the Acknowledgements page of the report) met four times during the process at key project milestones, including the existing conditions analysis; system phasing; and business planning. The two advisory committees, totaling nearly 70 members collectively, provided insightful feedback in several key areas, such as:

- Prioritizing bike share system goals;
- Suggesting station planning and promotional strategies to ensure bike share availability and usage among lower income and traditionally underserved neighborhoods;
- Revising the initial system map and phasing strategy to include additional high demand areas, such as Forest Park and Washington University in the first phase;
- Balancing density of stations with distance between stations to increase the service area in the first phase;
- Identifying system amenity preferences, such as helmet dispensing, transaction kiosk site availability and seasonal availability; and
- Identifying bicycle amenity preferences, such as need for supplemental locks, GPS and incorporation of bright colors in the final design of the bicycle



*Citizens/Business Advisory Committee meeting #1 at the St. Louis Central Library*

*Note: All meeting summaries are available in the Public Engagement Appendix, Section 2.*

## Online Surveys

Throughout the study process, two separate surveys were developed to solicit feedback from a broader audience of potential users. The first survey, which was launched in late April, asked respondents to rate the importance of ten potential bike share system goals. Additionally, respondents were asked to select their top two goals. With 318 respondents, **all** goals were deemed relatively important with a weighted average between 4.05 and 4.43 on a 5-point scale, with five being “very important”.

As demonstrated in Figure 12, “Enhancing the public transit network”, was selected as a top goal by almost four of ten respondents.

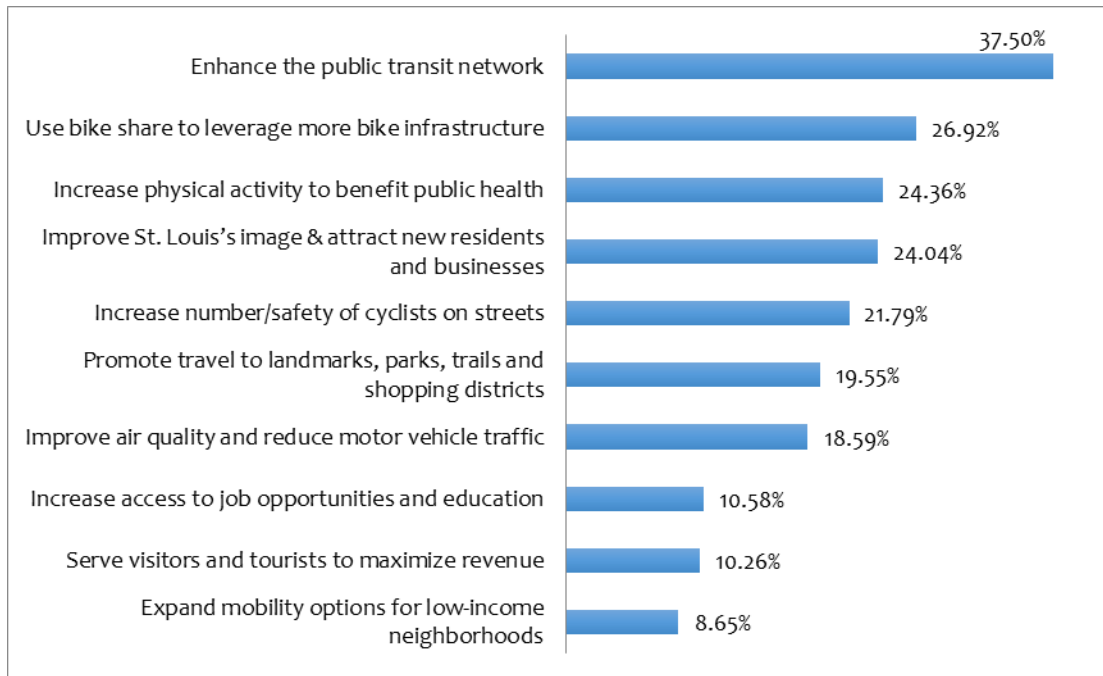


Figure 12: Bike Share Goals – Top Goals

The bike share usage survey, which was launched in mid-May, solicited feedback regarding:

- Likelihood of bike share usage;
- Potential frequency of using bike share;
- Key destinations within the region;
- Reasons for using bike share; and
- Barriers to usage.

With nearly 1,200 responding and almost evenly divided by gender (51% male and 49% female), 53% identified as St. Louis City residents and 36% identified as St. Louis County.

The remaining 11% identified as other counties surrounding St. Louis City and County. More than six of ten respondents stated they were “likely” or “very likely” to use bike share (Figure 13).

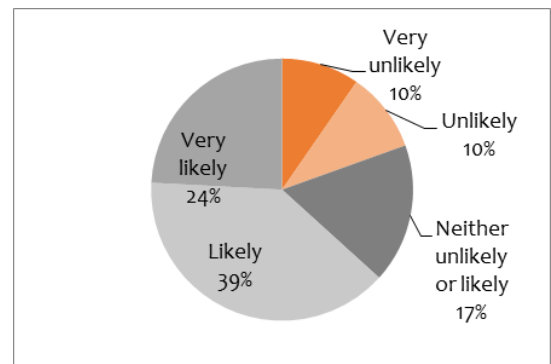


Figure 13: Likelihood of Using Bike Share

Excluding home and work or school, the respondents reported that they were most likely to travel to Central City (e.g., Central West End, Forest Park/ Skinker-DeBaliviere, Delmar Loop); South City (e.g., Tower Grove Park, Lafayette Square, the Hill) and Downtown St. Louis; and they would most likely use bike share for traveling to entertainment locations and special events and running errands (Figure 14 and Figure 15).

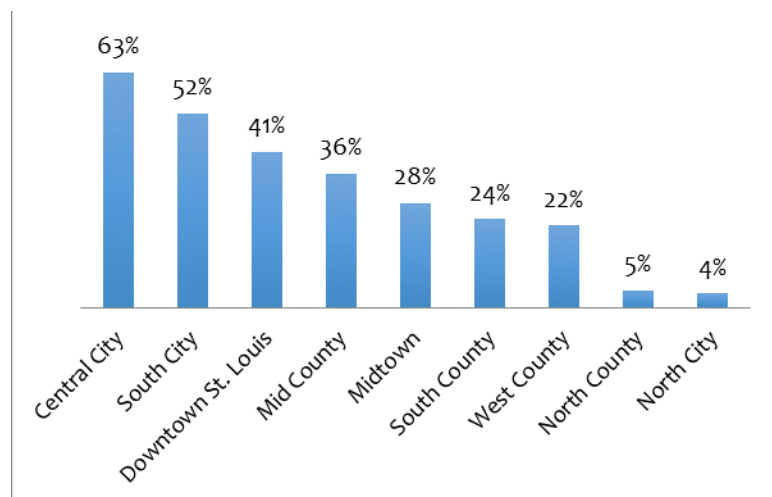


Figure 14: Key Destinations

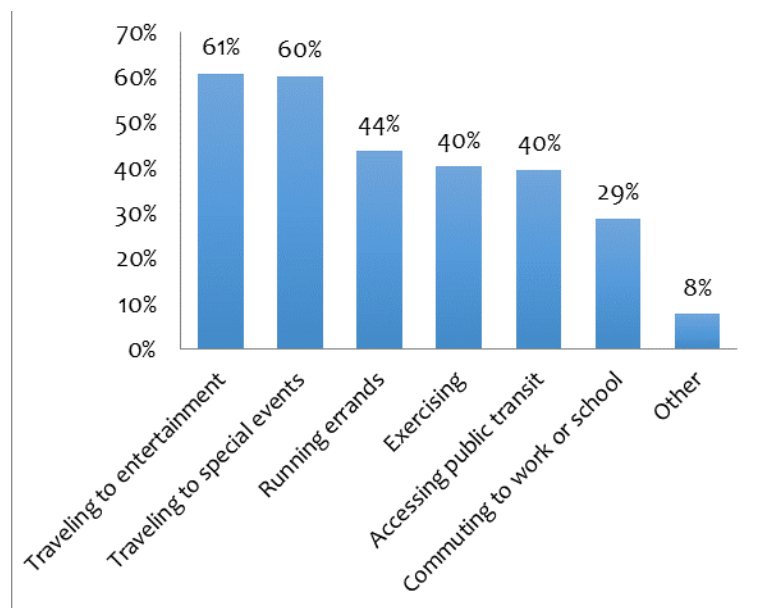


Figure 15: Reasons for Using Bike Share

Almost four of ten respondents who are likely to use bike share will use the system either daily or weekly. The remaining 60% anticipate using bike share primarily on weekends (20%), monthly (23%) or occasionally throughout the year (21%). The community also reported that the major barriers to more frequent use of a potential bike share system included the long distances between their given destinations and the lack of biking infrastructure in some areas of the city and county.

Of the 37% who responded that they were undecided or unlikely to use bike share, more than half of them (55%) indicated that they intend to continue to use their personal bicycle for travel.



The usage survey's final question asked respondents to share any other comments about the potentiality and feasibility of bike sharing in St. Louis. Slightly more than four of ten used the opportunity to express additional support for bike sharing in St. Louis, with statements like:

- “This could be giant for downtown tourism!”
- “A bike share connecting the central corridor and South City would be huuuuge.”
- “My health prevents me from riding but I think this is great for others, St Louis and community.”

*Note: Both survey summaries are available in the Public Engagement Appendix, Section 3.*

## Outreach Events

### “Pop-Up” Engagement

Although most survey respondents accessed the surveys' online version, the study team and Great Rivers Greenway also secured space at approximately ten events (farmer's markets, bike races and outdoor concerts) throughout the spring and summer. At these events, residents received information about bike share and were asked to complete the surveys described above.



*Members of the bike share planning team engaged the community of the Moonlight Ramble event*

### Focus Groups

Great Rivers Greenway wanted to ensure that equity was considered during the planning process. Although the goal of “Expanding mobility options for low-income neighborhoods” was considered important on the goals survey but just 8% of the respondents selected it as one of their top two goals, the study team conducted two focus groups with residents who are frequently under-represented in bicycling and bike share planning in other cities.

These meetings showed that this audience is just as likely to use bike share as the average bike share usage survey respondent. However, their usage barriers are slightly different from other potential riders. First of all, 80% have not ridden a bicycle since their teens. Therefore, bicycle safety instruction is required to ensure riding confidence. Also, while many had credit cards, they were reluctant to use them to secure the bike. For equitable usage, implementation strategies will need to address promotional, financial and educational strategies.

### Partners' Briefing

As an extension of the Technical Advisory Committee, Great Rivers Greenway invited representatives from potential partnering organizations to attend a briefing to learn about bike sharing and to determine their interest in implementing a system in St. Louis. At the briefing, attended by fourteen potential partners, attendees expressed an interest in pursuing bike share. All potential partners seemed interested in playing some role in securing a system. In the months following, Great Rivers Greenway will meet with each entity to discuss ideas for involvement and support with the governance (ownership and operations) of the system.

### **Bike Shop Owners Briefing**

When bike share systems are launched, some bike shop owners instinctively view the systems as competition for future bicycle purchases. However, the results are mixed, but favorable in most cities, where bike share users eventually become bicycle consumers. To mitigate concerns among bike shop owners, Great Rivers Greenway and its consulting team hosted a bike share briefing for owners. Twelve shop owners attended the session and all seemed very supportive of bike share because they believe having more bicycles on the streets will increase safety and encourage additional bike infrastructure investment.



*Phil Goff from Alta presenting to attendees at the November Open House*

### **Public Open Houses**

Throughout the eight-month study, two public meetings were held on May 15 and November 13, 2014. Attended by nearly 40 residents, the first meeting launched the planning process. After hearing an introduction to bike share, attendees were invited to take the goals survey and to identify potential station locations.

At the second open house, attended by more than 60 residents, community members learned about the system plan and phasing, and provided feedback on bicycle and station amenities, as well as a potential system name. For bicycles, attendees wanted them colored brightly with an embedded GPS, with supplemental lock and additional safety information on the handlebars, as well as on the transaction kiosks. Four of ten attendees felt that helmet dispensing is not needed at stations. However, 52% are interested in having dispensers at either all or key stations.

Overall attendees were mixed about having a transaction kiosk at each station. Only 7% stated a kiosk wasn't needed at any station. However, 36% feel transaction kiosks are needed at all stations; and 32% prefer transaction kiosks at most stations. Regarding operations, three of four attendees want the system to be available year-round with closure only during periods of inclement weather.

*Note: Detailed summaries of the Outreach Events are available in the Public Engagement Appendix, Section 2.*

## 7. Local Context Analysis

Assessing the opportunities and challenges of implementing a bike share system in St. Louis 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. The St. Louis region has many of the characteristics traditionally thought to support bike share, including well-supported visitor and recreational attractions, institutional and political support, compact and active Central Business Districts (CBD), an expanding network of bicycling infrastructure and greenways, and a well-used public transportation system. Currently, there are a handful of discrete, bike sharing programs already in St. Louis. This includes the Bear Bikes program at Washington University, shared bikes available from the Community, Arts + Movement Projects, and loaner bikes at a handful of hotels and apartment complexes in St. Louis. These programs are at a small scale however, and serve a limited population of users. The St. Louis Bike Share Study envisions a much larger community-wide network of bike share stations.



*Green bike lanes on Wydown Blvd are a key part of the region's expanding bike network.*

However, there are also a number of challenges, including sections of the region with low residential density, low bicycle use, limited (but growing) bicycle infrastructure, and a traditionally automobile-dominated transportation culture. The latter, in particular, is enabled by 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.

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 preclude the feasibility of a bike share system, but each factor influences the potential success of the system. A summary on the preparedness of the community is provided below, along with a discussion of some of the potential issues that may pose as barriers to successful implementation of bike share.

## 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 and on weekends. In St. Louis, bike sharing would provide an additional mobility option for:

- Local residents who live, work, learn and recreate in the bike share program service area
- Commuters traveling to the service area via transit or other transportation. 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 of the many colleges throughout the city and county
- Visitors and tourists accessing sports, entertainment, hotels and cultural attractions throughout St. Louis

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 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 over 318,000 people, St. Louis is the second largest city in Missouri after Kansas City, which has 464,000 people. St. Louis County's 2012 population is just under one million people. (The region includes 2.9 million, making it larger than Kansas City's regional population of 2.3 million.) For comparison, Chattanooga, TN has a population just under 170,000 and, in April 2012, launched one of the first bike share systems in the Southeast. St. Louis' city-wide population density is approximately 5,140 persons per square mile, which is lower than cities included in the initial deployment of bike sharing, but higher than some others that have since entered (e.g. Chattanooga).

*Table 6: City populations and density from the Bike Share System Comparison (source: Wikipedia)*

CITY	BIKE SHARE SYSTEM NAME	2012 POPULATION	POPULATION DENSITY (PEOPLE /SQ. MILE)
Chicago, IL	Divvy	2,715,000	11,864
Columbus, OH	CoGo Bike Share	809,798	3,624
Denver, CO	Denver B-Cycle	634,265	4,044
Greater Boston, MA	Hubway	878,786	ranges from 8,637 - 18,147
Kansas City, MO	Kansas City B-Cycle	464,310	1,474
Madison, WI	Madison B-Cycle	240,323	3,037
Miami Beach, FL	DecoBike	100,416	12,540
Phoenix, AZ	Gr:d Bike Share	2,107,926	2,798
City of St. Louis	N/A	318,000	5,140

Downtown St. Louis is home to approximately 90,000 jobs, with downtown Clayton at 35,000 jobs and the Central West End area with more than 20,000 jobs. In recent years, residential development in the area's CBD has increased and currently 14,000 people live in Downtown St. Louis.

## 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 (age 25-34) and income brackets (>\$50,000/year) 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 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. People in lower-income brackets tend to use bike share far less frequently in most cities, due to lack of stations and bicycle infrastructure in their neighborhoods, financial barriers and, in some cases, low levels of outreach and promotion by bike share system owners, operators or partner agencies.

Populations aged 25 – 34 years old represent the largest group of bike share users (39% - 49% of bike share users compared to only 18% - 22% of the general population). The City of St. Louis 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 the City of St. Louis it is 18.5% and 12.4% in St. Louis County, according to the 2010-12 American Community Survey,

Understanding where people in this age demographic live and work within the City of St. Louis and St. Louis 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.



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



## Employment

The City of St. Louis is the employment hub of the region with an estimated 252,300 jobs and a daytime population of 431,667<sup>2</sup>. As mentioned earlier, downtown St. Louis has an estimated 90,000 jobs with another 44,000 in downtown Clayton and 35,000 in the Central West End.

Major employers will serve as important trip generators and attractors for the bike share program, but 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 sharing, in combination with ongoing improvements to public transit service, could considerably increase residents' access to jobs.

*Table 7: Top 10 employers in metro St. Louis may serve as important destinations for bike share users<sup>3</sup>*

Employer	# of Employees
BJC HealthCare	25,200
Boeing Defense, Space & Security	15,129
Washington University in St. Louis	14,248
Scott Air Force Base	13,002
Mercy Health	12,489
SSM Health Care	11,898
Wal-Mart Stores Inc.	11,600
Schnuck Markets Inc.	10,919
Archdiocese of St. Louis	9,826
McDonald's	9,455

<sup>2</sup> Source: US Census Bureau, 2010-12 American Community Survey

<sup>3</sup> Source: St. Louis Regional Chamber. Major Employers – St. Louis, MO-IL MSA

## Visitors

The St. Louis region receives more than 25 million visitors annually and in 2012, regional direct spending by visitors was estimated at \$4.88 billion. Of the \$4.88 billion, approximately \$732 million was spent on transportation<sup>4</sup>. The peak season of tourism stretches from Memorial Day to Labor Day.

St. Louis is internationally known as the Gateway to the West and home of the Gateway Arch, its largest visitor attraction with up to 4 million per year. The St. Louis Zoo is a close second with 3 million per year. Additionally, the Anheuser-Busch Brewery and Missouri Botanical Garden are major attractions along with the various destinations within Forest Park, including the St. Louis Art Museum, the Missouri History Museum, the Muny amphitheater, the St. Louis Science Center, a skating rink, and golf, tennis and other athletic facilities. Forest Park also plays host to large events that draw tens of thousands of visitors, from Earth Day to the Great Forest Park Balloon Race. After New Orleans, the largest Mardi Gras celebration in the US occurs in the Soulard neighborhood in St. Louis. Such events could be considerable attractors for bike sharing. Many of the technologies available are adaptable to temporary, manned stations that allow event goers to check bikes in or out.



*The Missouri Botanical Garden could be a good candidate for a future bike share station.*

Although not all these attractions are centrally located and thus may not be covered in the first phase of a potential bike sharing program, their indirect impact of drawing visitors to hotels, restaurants, and other attractions is significant. In addition, bike sharing could link to other transportation options (such as tour and shuttle buses) that would allow visitors to avoid use of a car and offer them the opportunity to experience St. Louis at a slower pace by bicycle and appreciate the area's great attractions more comprehensively. This is one of the reasons bike share has been extremely popular in tourist-oriented cities such as Boston, Chicago and New York.

## Bike Share User Profiles

In other cities, a wide variety of people are interested in, and use, bike share. Many who use bike share don't identify themselves as "cyclists" and typically don't use bicycles for commuting or utilitarian purposes. Those who do use bicycles regularly, however, will also find bike share useful as another option due to bad weather on one end of their trip, mechanical problems with their regular bike, or simply wishing to try something different. The simplicity of the program and the safe-and-accessible design of the bicycles attracts people of a variety of ages and a far more-balanced gender ratio than bike commuting that is typically 3:1 men to women in many cities. The user profiles for a bike share program in St. Louis includes:

- **Local residents** looking to fulfill trips too long to walk and not convenient to drive or take transit for various reasons (cost of parking, no convenient bus route, etc.)

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<sup>4</sup> Fiscal Year 2013 Annual Report. St. Louis Convention and Visitors Commission

- **Business District commuters** needing to do lunch-hour errands
- **Transit riders** looking to get to their office or work site from a MetroLink station or bus hub without having to walk or transfer to a local bus
- **People who don't own a personal car or bike** looking for a supplement to transit
- **College students** needing a ride within or beyond campus
- **Visitors and tourists** accessing St. Louis's various destinations

Within each of these User Profiles are a potentially diverse range of area residents, workers and visitors who are simply looking for an additional mobility option within St. Louis. Some of these trips will replace long walks, others will replace bus trips and, based on experience from other cities, some will indeed replace trips made by private automobile. Some will find bike share to be not only convenient but a fun experience and a way to see the city from a different perspective.

## Policy Environment

The policy environment for bicycling in St. Louis has improved substantially in the last five years. Since 2001, the Great Rivers Greenway District has worked with Mayor Slay and the City of St. Louis Board of Aldermen to develop both the Bike St. Louis on-street bicycle facilities and the Gateway Bike Plan, a regional bicycling master plan. Since then, over 300 miles of bike facilities and trails have been implemented throughout the St. Louis region. Both the City of St. Louis and St. Louis County, along with the cities of Ferguson and Clayton, have recently adopted a Complete Streets policy that encourages roadway design for all modes of transportation and users.

While some municipalities in St. Louis County require all bicyclists (children and adults) to wear helmets, it is not required in the City of St. Louis. Helmets are mandatory for children 16 years of age and younger in Missouri, however. 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, the City's bicycling ordinances specify the rights of bicyclists to the road, including riding with traffic whether a bicycle lane or other facility is present or not. Bicyclists may also ride two abreast in the roadway.

Overall, the combined efforts of community-based advocates, local nonprofits, elected officials, and city/county staff has created a policy environment that is supportive of bicycle transportation within the City of St. Louis and many communities within the County. This political environment, the open policy towards bikes on MetroLink/MetroBuses and the recently adopted Complete Streets ordinances are conducive to successful implementation of bike share.

## Physical Characteristics

The City of St. Louis is located on the banks of the Mississippi River and covers approximately 62 square miles. St. Louis County is just over 500 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.

## Opportunities and Challenges

The City of St. Louis has a population density of approximately 5,157 persons per square mile. The County's density is much lower at 1,967 persons per square mile. While this may not be high in comparison to some bike-sharing cities such as Chicago or Washington, DC, the City has several key districts that bear increased density and a variety of uses. This includes, in particular, the areas that flank the Central Corridor: downtown St. Louis, Grand Center/Midtown, the Central West End, University City and downtown Clayton. These and other districts are gradually becoming denser with new residential, commercial and institutional development. Even areas of the city neglected for decades are seeing reinvestment and revitalization that helps to create additional demand for bike share. A qualitative understanding of areas of the City of St. Louis and St. Louis County that could host bike share was developed by looking at opportunities and challenges for each district. Those are listed below and on the following pages.

### ***Metro St. Louis***

#### Opportunities

- Introduction of bike share has reached many cities in the Midwest region: Kansas City, Chicago, Indianapolis, and Columbus
- Downtown St. Louis and Forest Park area contain major regional and national-level attractions
- A network of light rail transit stations that tie together most major employment areas and destinations, with a bus network that is comprehensive, regional and offer dozens of connections to the light rail system
- A flat topography
- Over 200 miles of existing on-street bikeways in St. Louis City and County
- Over 85 miles of regional trails and greenways in St. Louis City and St. Louis County

#### Challenges

- Lack of existing bicycle infrastructure in many neighborhoods and business districts
- Bicycling for transportation is slowly increasing in the City of St. Louis, but is not as common outside the inner ring suburbs
- Automobile travel and parking throughout most of the region is relatively easy and inexpensive (making alternatives more difficult to promote)
- The interstate and arterial network creates gaps and dead zones between active residential, entertainment, shopping and employment districts

### ***Downtown St. Louis***

#### Opportunities

- 90,000 jobs and 14,000 residents within a roughly two square mile area
- Bikeable distance within the core commercial business district



*Washington Avenue downtown is a busy corridor for jobs, shopping and restaurants.*

- Presence of key visitor attractions: Busch Stadium, Ballpark Village, Scottrade Center, Edward Jones Dome, America's Center Convention Complex, Mercantile Exchange, Citygarden, Gateway Arch, the City Museum, Union Station, Old Courthouse and Washington Avenue restaurants
- Access to/from six MetroLink stations, numerous bus routes and Metro's Civic Center Transit Center
- Gateway Multi-Modal Center (Greyhound and Amtrak)
- Downtown Bicycle Station
- Presence of Saint Louis University Law School, Webster University and Lindenwood University

#### Challenges

- Lack of existing bicycle infrastructure
- Physical constraints in terms of siting stations (busy roadways and/or narrow sidewalks in places, lack of solar exposure)
- Many modes of transportation competing within limited right-of-way
- High traffic levels along many streets
- Barriers created by I-44, I-55, I-64, and I-70, limiting connectivity to the Mississippi River and to neighborhoods to the south

### **Midtown**

#### Opportunities

- Grand Center is home to a large cluster of arts and entertainment, museums, and other cultural institutions, as well as residential areas
- Midtown Alley is a growing mixed use district stretching from Grand to Jefferson
- Home of Saint Louis University, with 13,500 students and 8,200 employees, and Chaifetz Arena
- Home of Harris-Stowe State University with 1,716 students and 427 employees
- Significant on-campus residential density
- Street grid allows bike share station locations
- On-street bicycle facilities

#### Challenges

- Grand MetroLink station is disconnected from SLU and cultural attractions by I-64 and intersection with Forest Park Avenue
- Gap in connectivity and activity between Grand Center and Downtown
- Many streets in the area are dominated by motor vehicles

### **Central West End**

#### Opportunities

- Major employment center with 35,000 jobs in immediate vicinity, led by BJC Medical Center and Washington University School of Medicine
- High density housing in the area with 14,500 residents
- Euclid Avenue destination restaurants and bars



- Central West End MetroLink station is in the heart of key healthcare institutions
- Expanding Cortex District with a planned light rail station
- Tower Grove Avenue and adjacent north-south streets provide good bicycle linkage to surrounding neighborhoods
- IKEA and other future retail
- Strong connectivity to Midtown
- On-street bicycle facilities



*The restaurants, bars and cafes on Euclid Avenue are popular with residents and visitors alike.*

### Challenges

- High traffic volumes, high speeds and wide travel lanes discourage bicycle travel along Forest Park Parkway
- High traffic volumes, high speeds, high turnover of parking and narrow travel lanes discourage bicycle travel along Lindell
- High traffic volumes/speeds on Kingshighway Blvd. limit connectivity to Forest Park on the west
- Area stakeholders with significant concerns about local traffic congestion, especially N/S roads
- Interchanges along I-64 have limited high quality connections of bicycle and pedestrian infrastructure to the area

### **North City**

#### Opportunities

- Proximity to downtown, Grand Center and Central West End for many neighborhoods without the interstate highway barriers that effect other districts
- Neighborhoods with high demand for transit services
- Proximity to Riverfront Trail system
- The Trestle, an elevated bikeway/park will be a signature attraction connecting to the Riverfront Trail and McKinley Bridge bikeway
- Significant destinations for other St. Louisans and tourists, including Fairground and O'Fallon Parks and the historic Bellefontaine and Calvary cemeteries
- Pockets of revitalization are taking place within Old North, such as the 14<sup>th</sup> Street Business District and elsewhere

### Challenges

- Large tracts of land with very low housing density
- Limited business districts and other destinations
- Lack of clearly-defined bike routes and infrastructure
- Supported only by MetroBus services

## **South City**

### Opportunities

- High residential density in the Tower Grove and Dutchtown neighborhoods
- South Grand Business District, Cherokee Street Business District, Soulard Market, the Anheuser-Busch Brewery, Tower Grove Park, Lafayette Square, The Hill, The Grove Business District, and Missouri Botanical Garden are all key destinations
- A demographic (24-25 year olds) currently more supportive of bicycle initiatives than elsewhere in St. Louis
- On-going bike-facility improvements will improve connectivity to Forest Park, the Central West End and Downtown



*Though connectivity barriers to the north exist, residents in South Grand neighborhood may embrace bike share.*

### Challenges

- I-44, I-55 and I-64 create physical and psychological barriers to the Central West End, Soulard and Downtown
- The Grove is a natural destination for bike share but is relatively isolated
- South City is supported only by MetroBus services

## **Forest Park Area/DeMun/Washington University/Skinker-DeBaliviere**

### Opportunities

- Dense urban neighborhoods around the park
- Neighborhood business districts in close proximity to the park
- Washington University Campus and housing with over 14,000 students and nearly 13,000 employees
- Multiple destinations within Forest Park
- The park has significant project partners as resources
- Park benefactors are key resources for park improvements
- Over 12 million visitors to Forest Park annually
- 2 MetroLink stations
- New trolley planned on DeBaliviere Avenue to Forest Park

### Challenges

- Circulation issues are present in the park even with the bus circulator and relatively-well connected path system
- Forest Park is surrounded by I-64 to the south, Kingshighway to the east, and Skinker to the West, each of which present barriers to bicycle transportation

## Loop District

### Opportunities

- The Loop Commercial District is a key destination in the St. Louis region; Delmar Blvd's restaurants, bars and cafés can be a major generator of bike share activity
- Close proximity to Forest Park and Washington University
- A pair of MetroLink stations and MetroBus routes provide ample transit coverage
- Loop Trolley will increase connectivity to Forest Park via Delmar and DeBaliviere Boulevards
- Significant Washington University student, faculty and staff population
- Short distances between destinations within University City and adjacent communities and amenities, such as Clayton, Forest Park, and Central West End



*One of the many attractions along the St. Louis Walk of Fame along Delmar Blvd.*

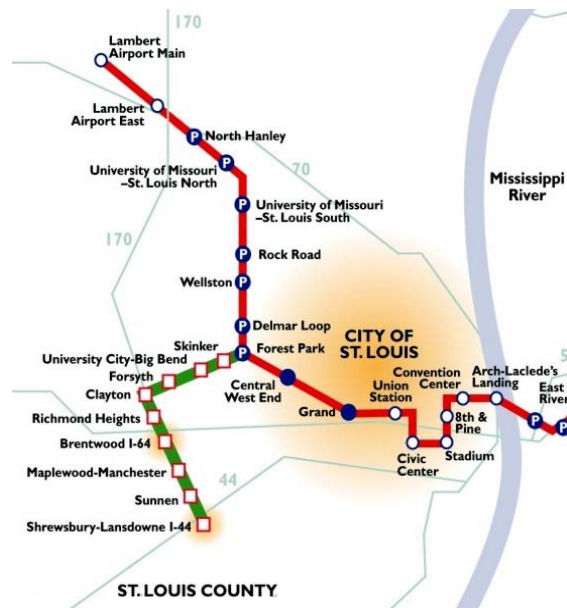
### Challenges

- Lack of bicycle facilities to the Loop from Clayton, the City of St. Louis, and Forest Park
- Lower density neighborhoods to the northeast and east

## Downtown Clayton

### Opportunities

- Significant employment destination and daytime population of over 44,000
- Two MetroLink stations, one of which possesses a large public parking garage
- Transit Oriented Development District policy
- Bronze-level Bike Friendly Community reflects community values and commitment to bicycling
- Close proximity to Forest Park via Wydown Blvd., a bicycle-friendly route
- Close proximity to the Loop District, Washington University and Forest Park
- Good bicycle infrastructure connecting to the City of St. Louis



*Figure 16: MetroLink transit map*

### Challenges

- Lack of bicycle infrastructure connecting Clayton to adjacent communities, including Ladue to the west, Brentwood and Richmond Heights to the south, and University City to the north

### ***MetroLink Corridor***

#### ***MetroLink stations in St. Louis County - North***

##### Opportunities

- Seven MetroLink Stations serving North County with numerous MetroBus Routes
- Clusters of large employers and job centers; Boeing, Emerson Electric, Express Scripts North Park, Earth City Business Park, Lambert International Airport and the University of Missouri –St. Louis
- UMSL – North station provides trail connection to Ferguson, a bronze level Bike Friendly Community
- Ted Jones Trail, St. Vincent Greenway and Maline Greenway provide off street connectivity

##### Challenges

- Limited connectivity for bicycle transportation
- I-170, I-70, and I-270 create physical barriers for bicycling
- Longer distances between destinations and from potential “core” bike share service area near Forest Park and in downtown St. Louis

#### ***MetroLink stations in St. Louis County – Mid County***

##### Opportunities

- Five MetroLink stations between Richmond Heights and Shrewsbury
- Regional recreation destinations in Tilles Park
- St. Louis Galleria, Plaza Frontenac are large generators of jobs and retail activity
- Historic commercial business districts in Kirkwood, Maplewood and Webster Groves
- Webster University campus with 22,000 students and over 1,600 staff and faculty
- Street connectivity supports bike travel

##### Challenges

- I-44 and I-64 present barriers to bicycle connectivity
- Lack of bicycle facilities

## ***Barriers Analysis***

As described in the section above, there are a number of districts in which interstate highways, expressways, high-volume arterials and industrial areas present real and perceived barriers to travel by bicycle. This is a connectivity issue related to bicycling in general within the St. Louis area of course, but is particularly relevant for bike share. Because a good portion of bike share users are likely to be visitors and/or novice bike riders, the visual or spatial barriers between districts or destinations could play a role in whether someone decides to use bike share.

As such, Figure 20 was developed to help visually understand the various barriers that exist within the City of St. Louis and communities within St. Louis County. Contiguous areas without or with minimal barriers are likely to work quite well as part of the bike share service area. For areas separated from others by one or more barriers, use of bike share is likely to be lower compared with similar areas lacking barriers. For instance, while neighborhoods in South City exhibit many characteristics for bike share success—population demographics and density, retail corridors, many restaurants and cafes, etc.—because they are separated from destinations along the Central Corridor by I-44 and I-64, they may not be good candidates for the initial phase of a bike share program. This can be mitigated however, with continued improvements to the bikeway network within the city.



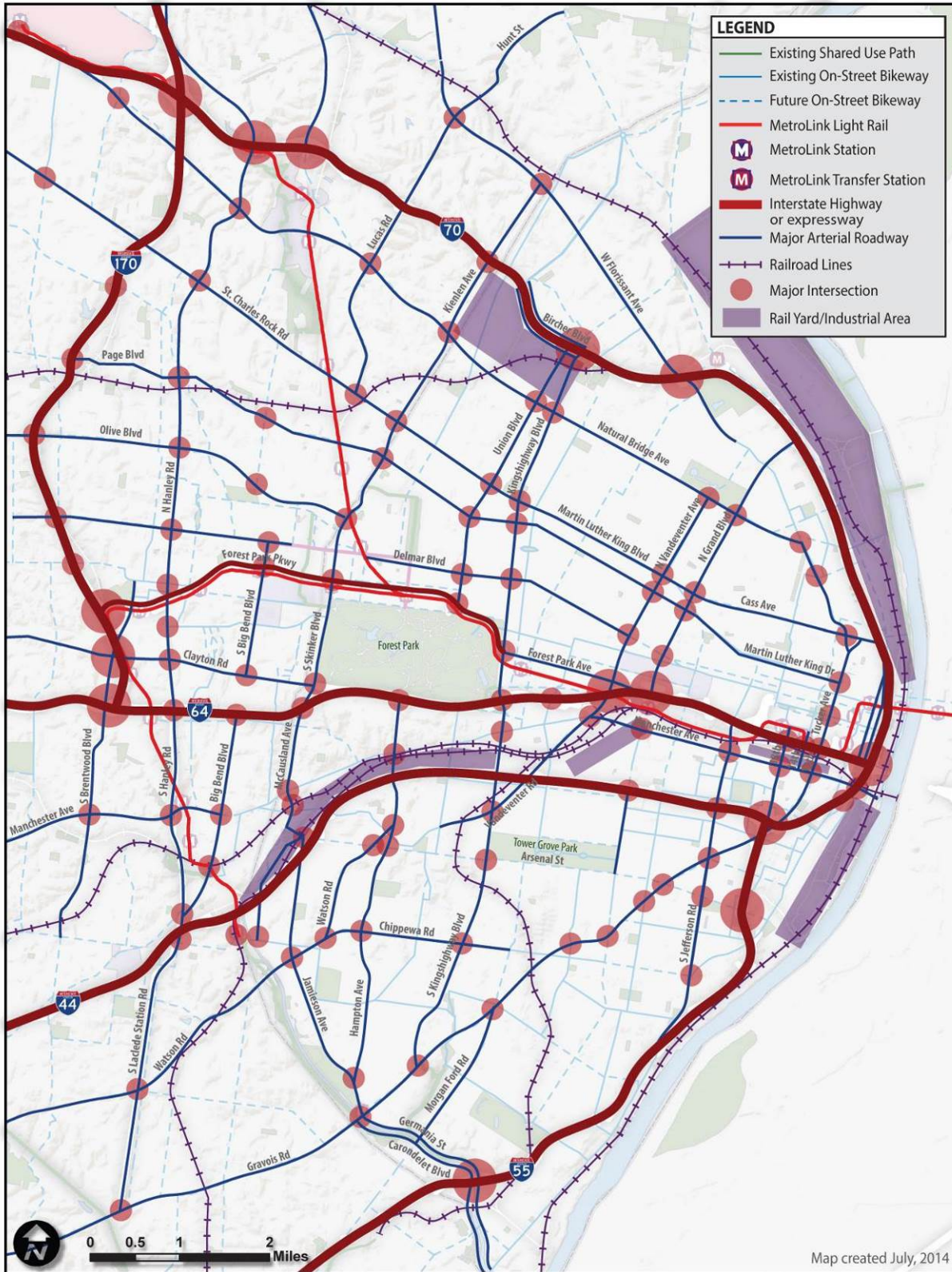


Figure 17: Real and perceived barriers to bicycle travel and bike share usage

## Transit

Providing a contiguous bike share service area between the compact, mixed-use areas and adjacent neighborhoods will be a challenge for the initial phase of the system. The infrastructure barriers and land use gaps presented in Figure 20 are the primary reason for the likely lack of continuity. Transit, especially the MetroLink system, will play an important role in providing connections between these areas, with bike share providing a “last mile” option to close the gaps. It is for this reason that bike share stations are likely to be located at most MetroLink stations and key bus transfer centers within the overall service area (described in Section 8 of this report).

The regional transit agency, Metro, transports over 128,000 riders per day throughout Greater St. Louis with a 468 vehicle fleet that includes paratransit vans, light rail and conventional accessible buses.

The MetroLink light rail system connects the St. Louis region, extending from the Lambert Airport and Shrewsbury to the west to Downtown St. Louis and east across the river into Metro East. There are a total of 37 MetroLink stations, including the 11 stations in Illinois.

MetroLink stations, especially those with multi-bus line transfers, are good candidates for bike share stations. For some shorter trips, bike sharing offers a more efficient option than existing transit. Other cities have found that the added service offered by bike sharing has reduced dependency on private automobiles and increased the attractiveness of transit as a travel option. MetroLink stations also tend to be located near dense mixed-use areas of metro St. Louis, a natural area for high demand for bike share. MetroLink stations also have a smaller footprint than large-scale bus depots or park-and-ride facilities and are more conducive to multi-modal connections to bike share.

## Bike Network

The City of St. Louis and St. Louis County have a limited but rapidly growing bikeway network. Throughout the region, community stakeholders recognize a lack of safe bicycling infrastructure. Yet the city has a strong and growing bicycling culture, characterized by thriving bike shops, annual increases in the number of participants in Bike to Work Day, the Penrose Park Velodrome, and the work of groups such as Trailnet and the Great Rivers Greenway District. As mentioned previously, St. Louis has made significant advances in its bikeway network and in securing funding for implementing new bikeway facilities since 2005.

Currently, the bikeway network in the City of St. Louis and St. Louis County includes:

- 56 miles of bicycle lanes (plus 7 miles of buffered bike lanes)
- 93 miles of shared use paths
- 10 miles of signed shared roadways
- 64 miles of a marked shared roadway



*May 2014 Bike-to-Work day event at the Missouri History Museum*

The recent Gateway Bike Plan and River Ring Plan recommend an additional 625 miles of on-street bikeway facilities and 225 miles of regional trails and greenways in the City of St. Louis and St. Louis

County. In addition, 14 municipalities in St. Louis County have completed bicycle and pedestrian master plans, while another seven are in the process of developing plans. Each of these local bicycle and pedestrian master plans includes recommendations for both on- and off-street bikeways, adding to the total number of recommended bicycle facilities in the study area.

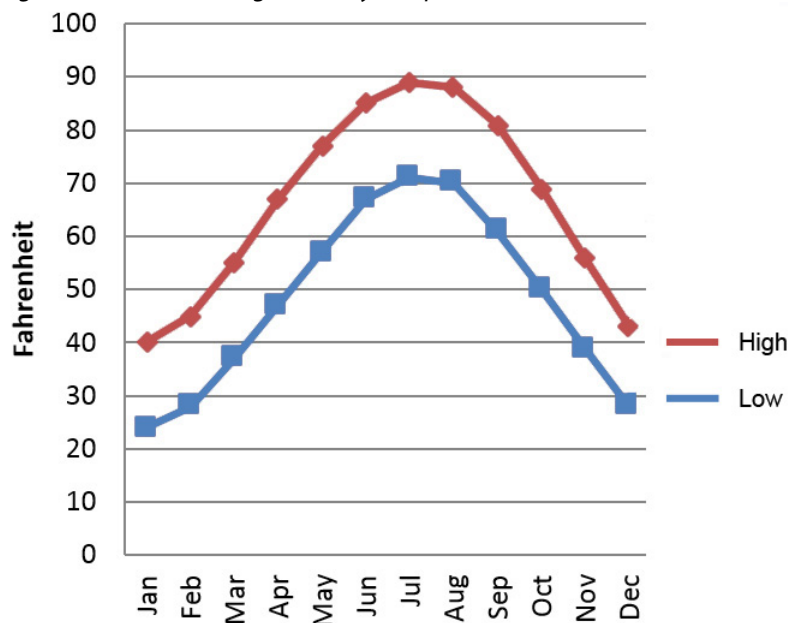
There is limited information to suggest whether a dense network of bicycle infrastructure is required in order for bike sharing to be successful. For North American systems, it's noted that bike share systems have acted as a catalyst for increased investment in bicycle infrastructure. This has happened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

## Weather

Weather can influence bike share demand. Figure 18 and Figure 19 show average monthly temperature and rain fall in St. Louis. In general, the region experiences warm to hot temperatures during summer months and mild to cold temperatures during the fall, spring and winter. Precipitation is moderate throughout the year with averages between 2 to 5 inches of rain per month.

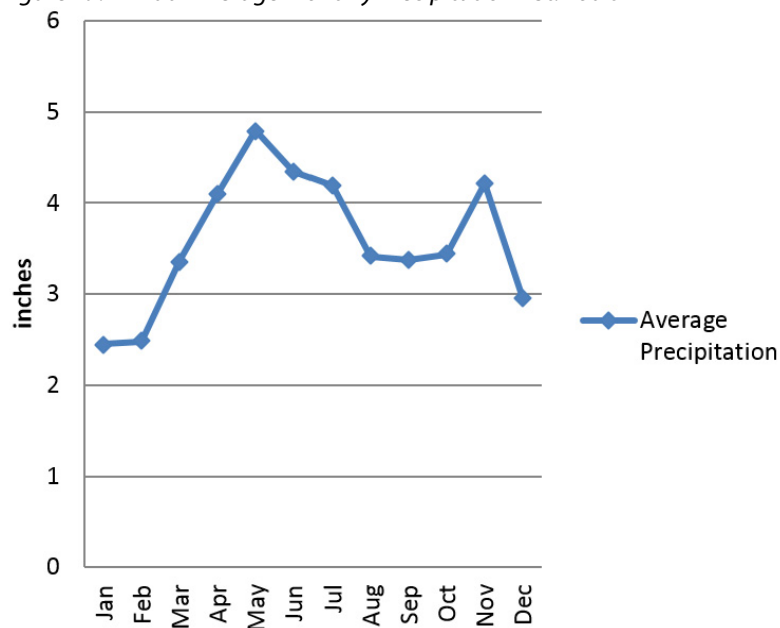
Figure 18: Annual Average Monthly Temperatures – St. Louis<sup>5</sup>



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



Figure 19: Annual Average Monthly Precipitation– St. Louis



The highest demand months will occur during the peak tourism season from May to September (Memorial Day to Labor Day). 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). The pleasant spring and fall weather and the relatively mild winters will provide steady riding demand outside the peak season – primarily from residents. Some bike share systems shut down during winter months due to snowfall and icy conditions. These are mostly in the Northeast and Northern Midwest, including Minneapolis, Madison, Montreal and Boston. Because temperatures are milder, and snowfall less significant relative to those cities, operations in St. Louis are recommended for year-round use. Winter closures would be temporary and occur only during and immediately after snow and ice storms.

### Existing Conditions Summary

The City of St. Louis and the surrounding communities bear many characteristics supportive of a successful bike share system. Key strengths of metro St. Louis include:

- Support from elected officials and recent policy changes that have established momentum for bicycle infrastructure and initiatives
- Fast-growing bikeway network, both greenway trails and on-street facilities
- Ongoing Central Corridor development, which will increase demand for bike share
- Substantial tourism industry with national-level destinations that draw millions on an annual basis



Mayor Slay has shown strong support for the expansion of St. Louis' bike network.

- Relatively large college student population and high numbers of residents aged 25 to 34 (the “early adopter” demographic in many cities)
- Density of employment areas within downtown St. Louis and Clayton and the Central West End
- Relatively mild winters and moderately hot summers that presents the opportunity for a year-round deployment
- Flat, gentle topography
- An expansive bus network and well-used MetroLink system that tie together the areas with the highest demand for bike share.

The primary challenge for bike share in St. Louis is the significant gaps between mixed-use areas with high residential and/or employment density. In many cases, these gaps are areas where most potential bike share users would not feel very comfortable, due to busy roadways with high-speed traffic and wide intersections. Some gaps are due to interstate highways that create physical and psychological barriers between residential neighborhoods and districts where MetroLink stations, jobs and destinations can be found.

Improving bikeway connections between districts can mitigate these key challenges. Improved bikeway connections between The Loop and the Central West End, Grand Center and downtown, North and South City and the Central Corridor neighborhoods would be the most critical to focus upon. Additionally, ongoing redevelopment can also close the land use gaps.

An additional challenge is the heavy reliance on motor vehicle trips and ease of motor vehicle travel. The well-developed network of highways and arterials simplifies automobile travel in greater St. Louis, except perhaps during peak periods. Parking is generally plentiful and inexpensive with only a few exceptions. This does not preclude a bike share system, but could be a hurdle to achieving the desired high levels of use.

## 8. Bike Share System Planning

Defining the system’s coverage, or “service area”, of the system considers a number of factors: level of **demand**, **equity**, and **community input**. All three are carefully taken into account in order to determine a recommended service area, station density and phasing. The overall framework for this analysis is the understanding that the bike share program desired for the St. Louis region is one large enough—nine square miles for Phase I—to provide an additional transportation option for a significant portion of St. Louis and other communities in the County. As such, the recommended launch size will be within the relative size of bike share systems launched in Minneapolis, Boston, Washington D.C., or Columbus, OH<sup>6</sup>. Other cities have much smaller systems that provide an amenity for a smaller area—typically the downtown core—but do not provide an additional element within the city-wide transportation system.

### Demand Analysis

The opportunities and challenges analysis described in the previous section is *qualitative* in nature and based on the project team’s knowledge of the various districts and input from stakeholders and the general public. This section of the system planning is *quantitative* in nature and incorporates data available from the State, County and City’s GIS-based (Geographic Information Systems) data sets. The data is then used within a model developed by Alta Planning + Design to determine relative demand for bike share. The data inputs are based on:

- Residential density (where people live, including student housing)<sup>7</sup>
- Employment density (where people work)
- Transit demand (where people take transit. Weighted locations for dual-line MetroLink stations at 5X, single line MetroLink or MetroBus transfer centers at 3X and MetroBus stops at 1X each)
- Recreation demand (where people recreate focused on job locations related to cultural destinations, restaurants and retail establishments).

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 attract the highest value sponsorships, and as a result are the most likely to be financially sustainable. High demand areas were identified through a heat mapping exercise that allocated points based on where people live, work, take transit and recreate within the St. Louis region.

To maximize the financial feasibility of the initial bike sharing system, it is proposed that the majority of stations in Phases I and II be launched in areas with the highest demand. This will accelerate financial

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<sup>6</sup> The initial launch areas for Minneapolis, Boston and Washington, DC were approximately 8 to 12 square miles. The initial launch, and current service areas in Columbus OH and Boulder CO are roughly 5 square miles.

<sup>7</sup> It should be noted that residential density does not take into account temporary residents, i.e. those staying in the St. Louis region in hotels, inns and motels. Hotel, inn and motel employees are included in the employment density analysis, however, and serve as a *de facto* proxy for the increased demand that hotels—especially large hotels in walkable, commercial centers—create for bike share ridership.



sustainability of the system and allow subsequent revenues to be directed into expanding the system in 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

Individual “heat” maps are developed for each input to determine where demand for bike share may be generated. Color spectrums are set at threshold levels to indicate relative demand within a 1000’ grid overlaid onto a rough service area that might reasonably be expected to support bike share in the foreseeable future. This includes all of the MetroLink. Bike share may one day become feasible beyond these communities or in Illinois, but the map analysis for this Study stays focused on more densely-developed parts of the region.

The series of heat maps on the following pages are based on the four data inputs described above. The final map in the series is the “composite” heat map that indicates the overall demand for bike share within the St. Louis region. To form the composite map, each input is weighed equally. There are pros and cons for each of the four data inputs to be more or less heavily weighed, so based on experience, all four remain equal for this effort.

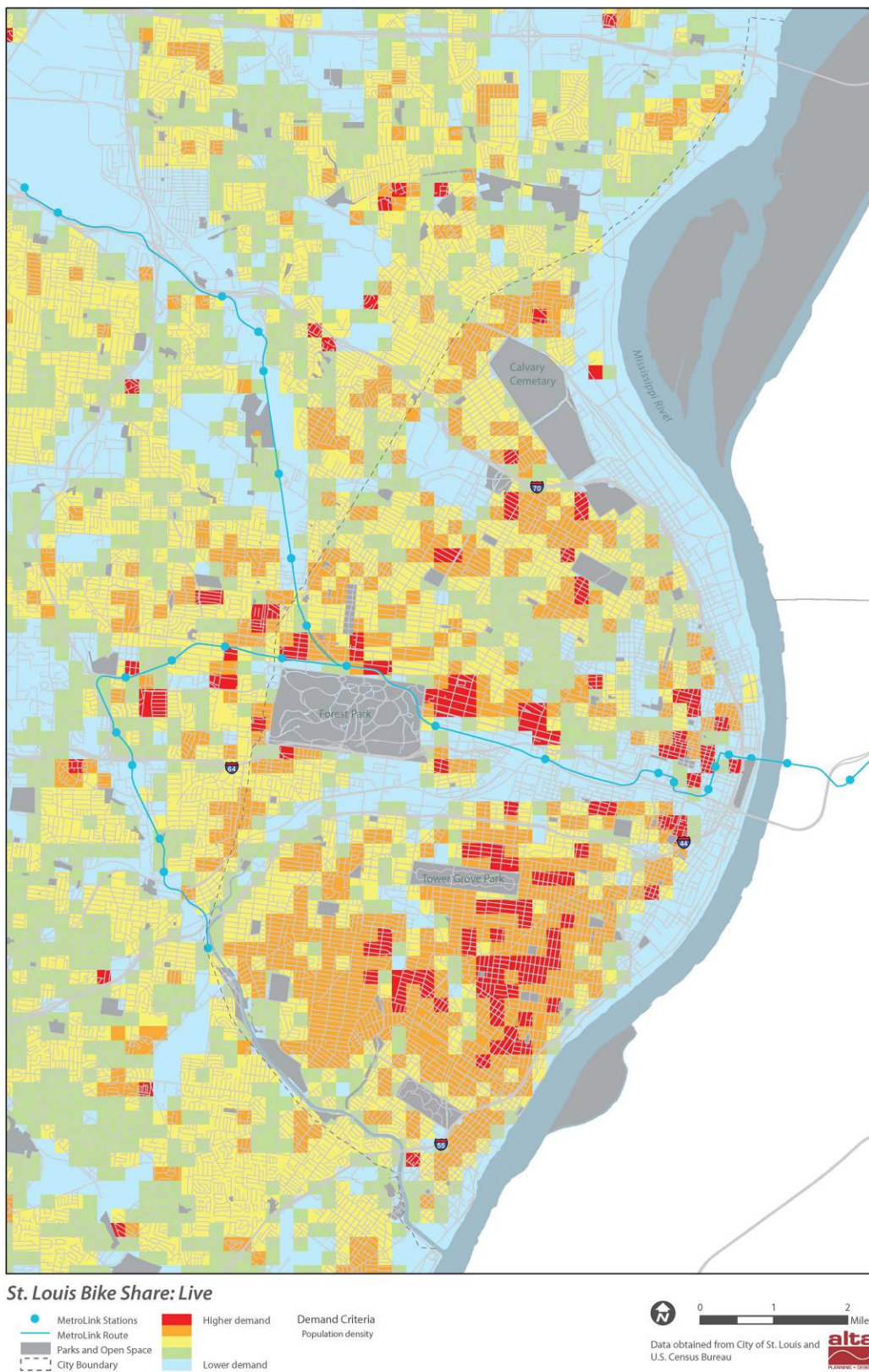


Figure 20: LIVE: Analysis map showing relative levels of residential population density

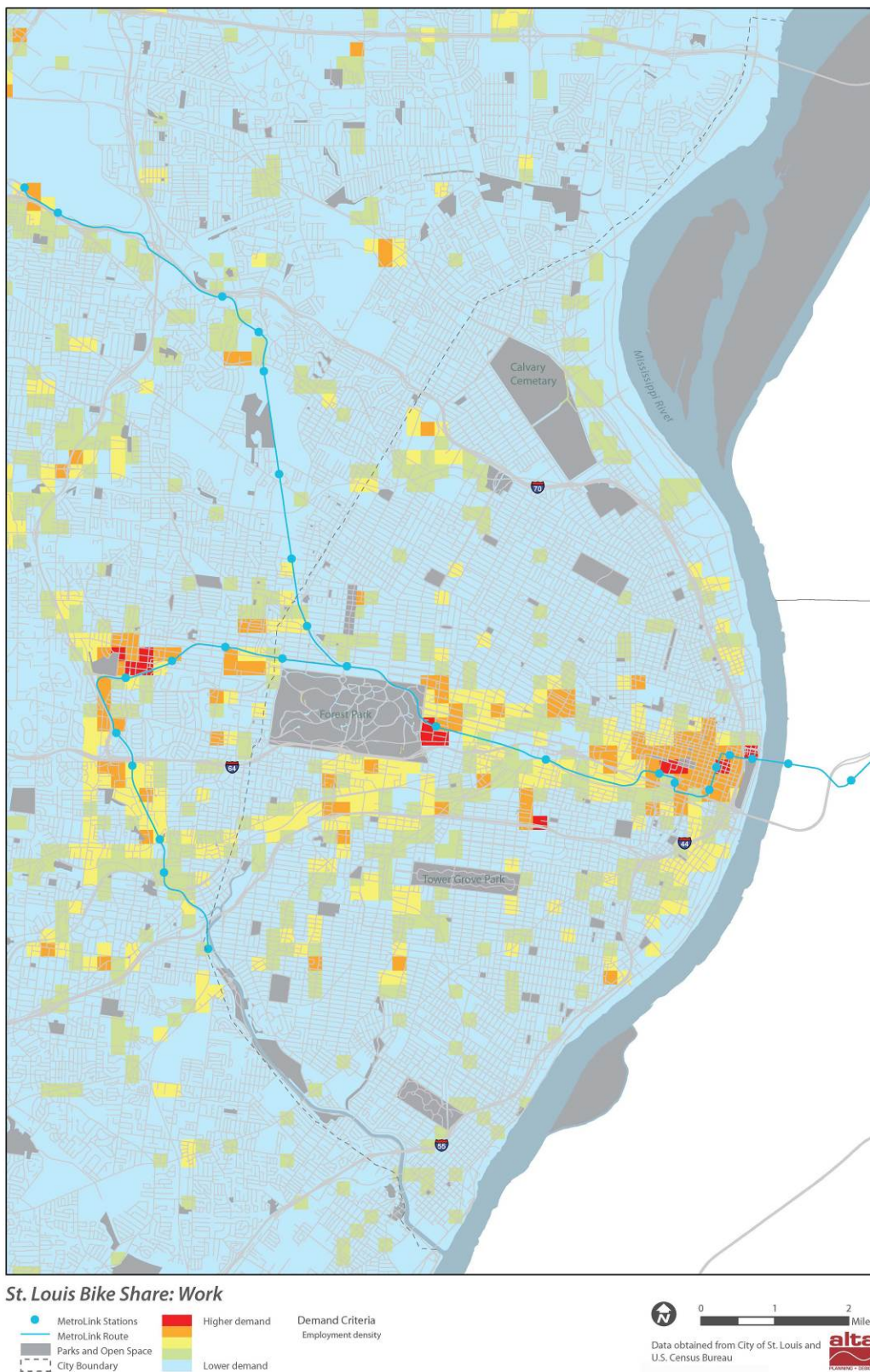


Figure 21: WORK: Analysis map showing relative levels of employment density



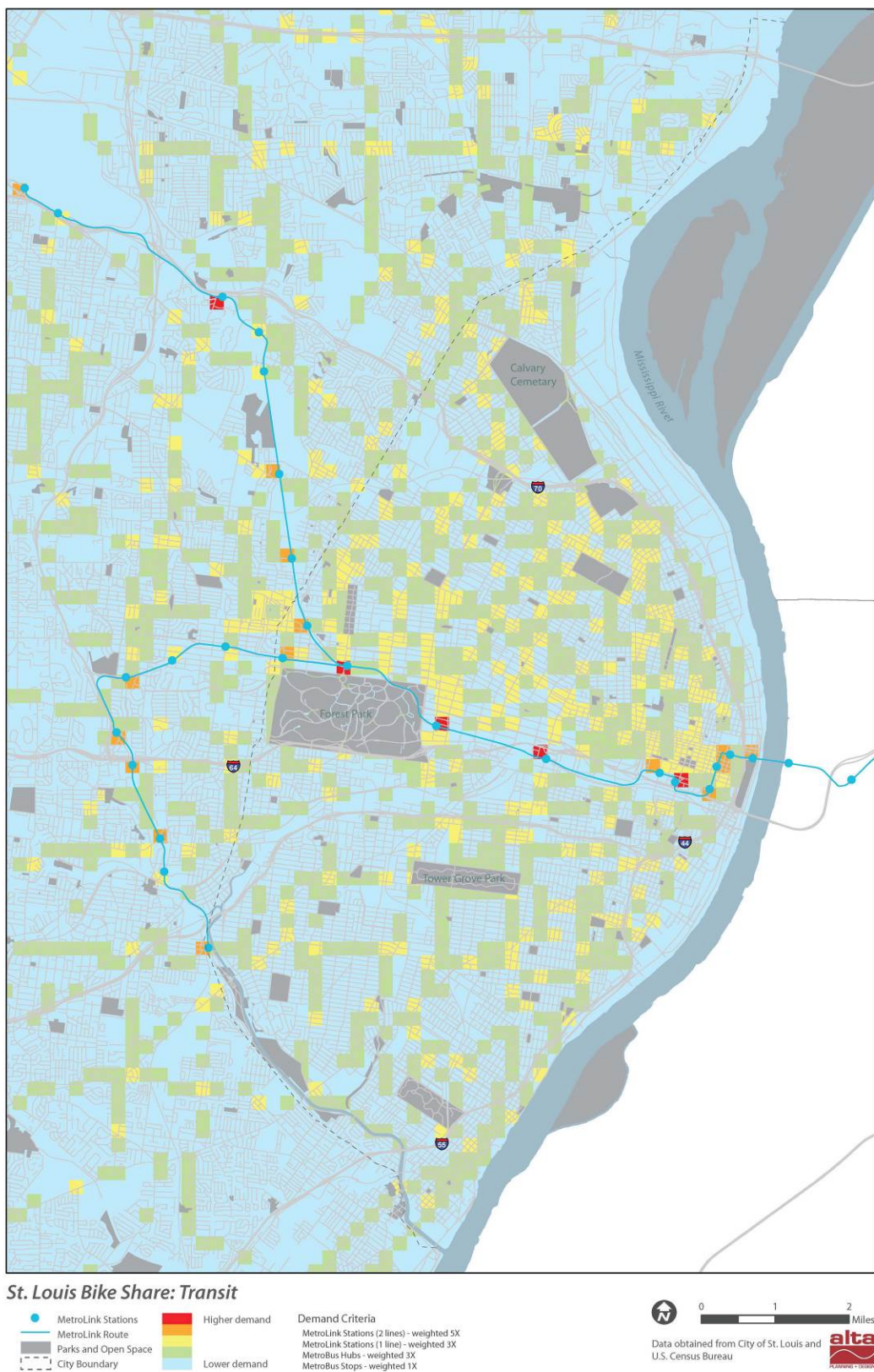


Figure 22: TRANSIT: Analysis map showing relative levels of use of the transit system

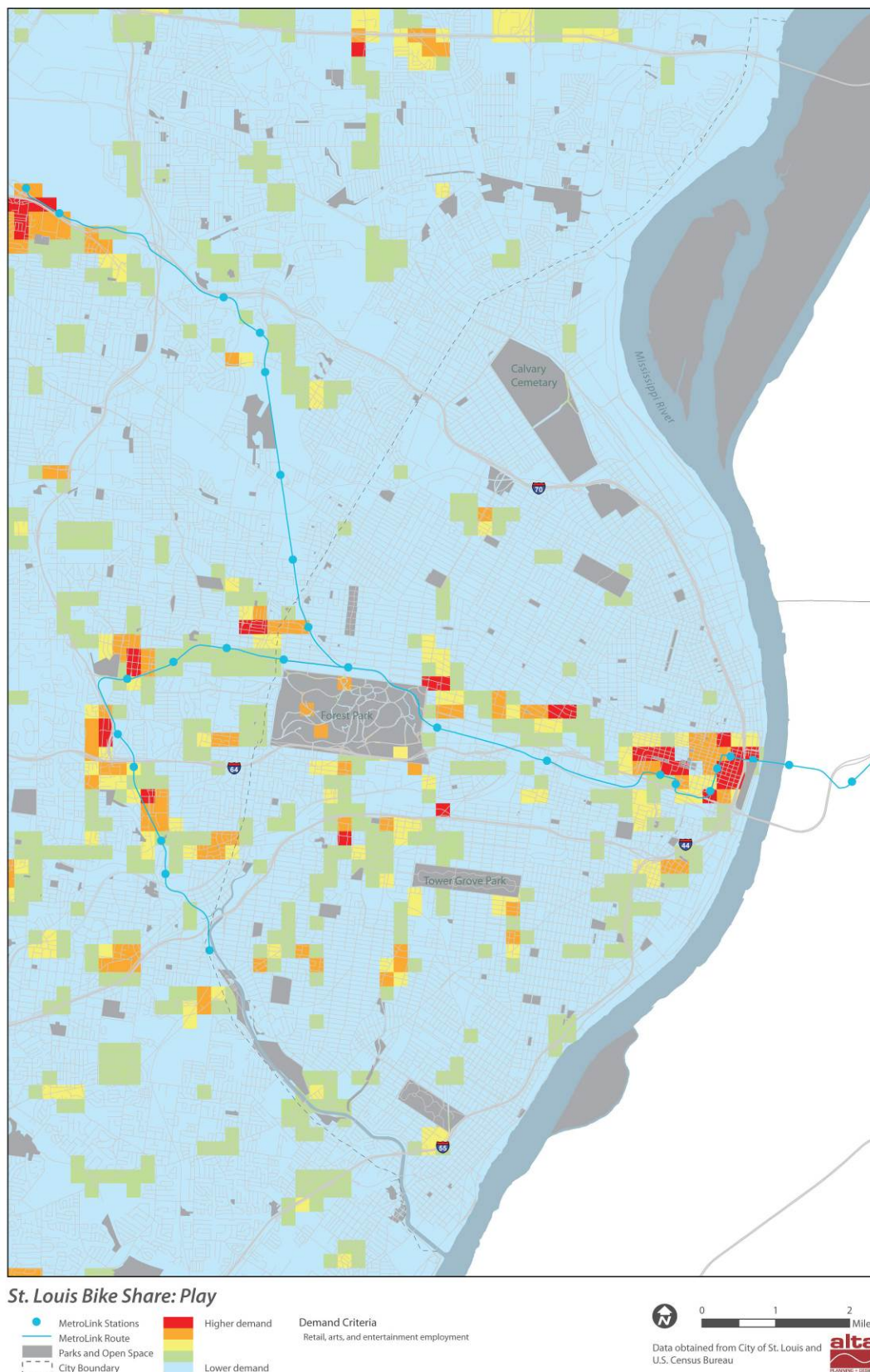


Figure 23: RECREATE: Analysis map showing location of jobs related to destinations, shopping and eating



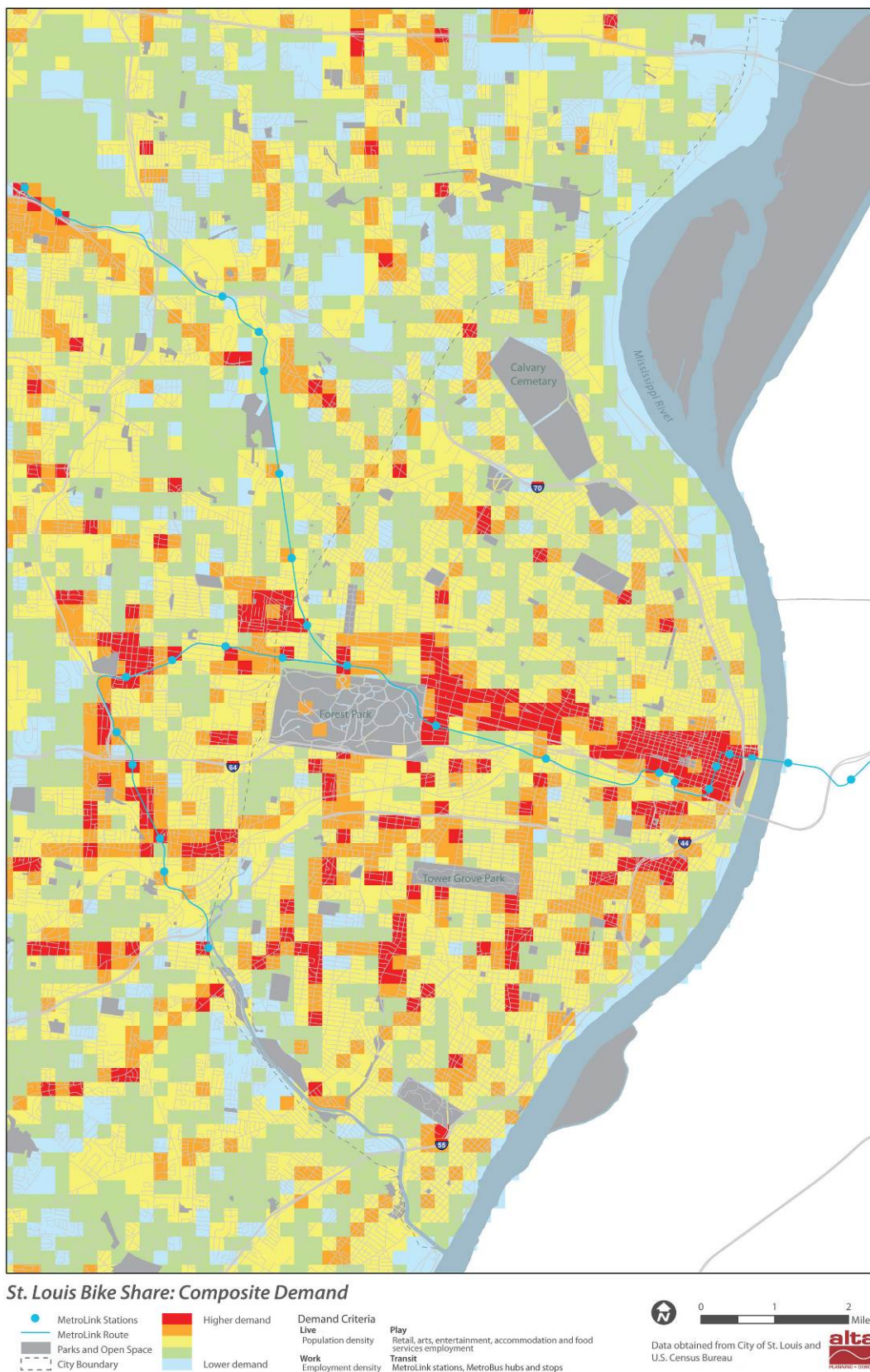


Figure 24: COMPOSITE: Analysis map showing a combination of LIVE, WORK, TRANSIT and RECREATE



## Equity Analysis

While bike share systems have typically launched in high demand (and higher revenue) 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 to more residents and ensuring this low-cost transportation option is accessible to under-served communities. Details of the efforts being undertaken in several cities, along with recommended programs for the St. Louis region, are outlined in Section 13.

The planning team also conducted two focus group discussions with residents – specifically low-income, people of color and transit dependent – that are disproportionately underrepresented in transportation planning studies and bicycling. While barriers to usage for these groups differ from other potential users, the twenty-two participants are, according to the bike share usage survey, just as likely to use bike share as other St. Louis residents. The likelihood of using bike share was 3.8 on a 5-point scale for focus group participants and 3.6 on a 5-point scale for all survey respondents.

The data and comments from the discussion sessions partly informed the recommended bike share equity strategies. Specifically, the barriers mentioned by the participants are divided into three categories: **outreach and marketing**, **financial**, and **bicycling behavior**.

- **Outreach and Marketing** – Promoting bicycling as another means of transportation is critical to this audience because cycling is viewed as a recreational activity only. Participants in both sessions mentioned including “people like them” in promotional materials to ensure inclusivity and promote usage to all St. Louis residents. Additionally, they mentioned promoting usage at transit centers and/or MetroLink, so that riders would see the value of using bike share for last mile commuting.
- **Financial** – While the annual and daily pass fee estimates were not mentioned as barriers, the credit card requirement for securing the bicycle’s value if not returned was considered a barrier. Most focus group participants mentioned using a debit card, a “gift” card, or an integrated transit/bike share card to pay for their pass. Additionally, some members suggested having a monthly pass, in addition to the annual or daily pass options because this would allow them to budget more effectively.
- **Cycling Behavior** – Most participants, about 80%, haven’t ridden a bicycle since their teens, and at that time, they were riding on the sidewalk. Therefore, providing education about the “rules of the road” and suggesting travel along bike friendly streets should be key components of an education campaign. Additionally, it is possible that some potential users may benefit from bike riding instruction.

With regards to 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. Percentage of population representing people of color

2. Percentage of households below 200% of poverty level (as defined by the U.S. Census Bureau)
3. Percentage of households with no automobile available for daily use
4. Percentage of households where the adults are non-English speakers

Each of the four indicators above were mapped graphically and shown in Figure 28 through Figure 29 on the following pages. The census-based data from each of the four was amalgamated into a single composite map in order to summarize system equity graphically<sup>8</sup>. As shown in Figure 29, areas that scored highest on the composite “equity” scale include many neighborhoods throughout North City, areas to the west and south of downtown St. Louis, and a few census tracts in South City.

In aggregate, the equity mapping exercise was used to shape the recommended service area and phasing. For example, the Phase I service area (described on pages 65-67) includes an area that could host up to five bike share stations in the Carr Square, Vandeventer, Academy, and West End neighborhoods. The equity analysis also helped to shape the size and placement of the Phase III expansion areas to ensure that communities of color or immigrant groups within low-income areas that have far lower than average rates of automobile ownership or English-speaking residents have considerable access to a future bike share system. Bike share station placement in such areas will expand the available options for access by bicycle and promote connectivity to MetroBus lines.

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<sup>8</sup> The methodology used to develop the composite equity map includes a mathematically-based model. The model uses the top 25th percentile as the threshold for each of the four socio-economic indicators. If a census tract’s percentage for a particular variable fell in the top 25th percentile when compared to all the census tracts in the study area (i.e., 3/4 of data was below this score), the tract was assigned a score of one (1). The scores for the variables were then summed so that a higher composite equity score was assigned to those tracts that had more scores per variable in the top 25th percentile.

The high composite equity score has a maximum possible score of four (4) and a low equity score has a minimum possible score of zero. For example, a tract that scores within the top 25th percentile for low-income, non-white, non-English and limited vehicle access would receive a composite score of 4, and is shown in the darkest shade of purple. This scoring method highlights those census tracts that scored in the top 25th percentile of the four variables the most, and can be used to identify areas that have the greatest concentrations of traditionally underserved populations.

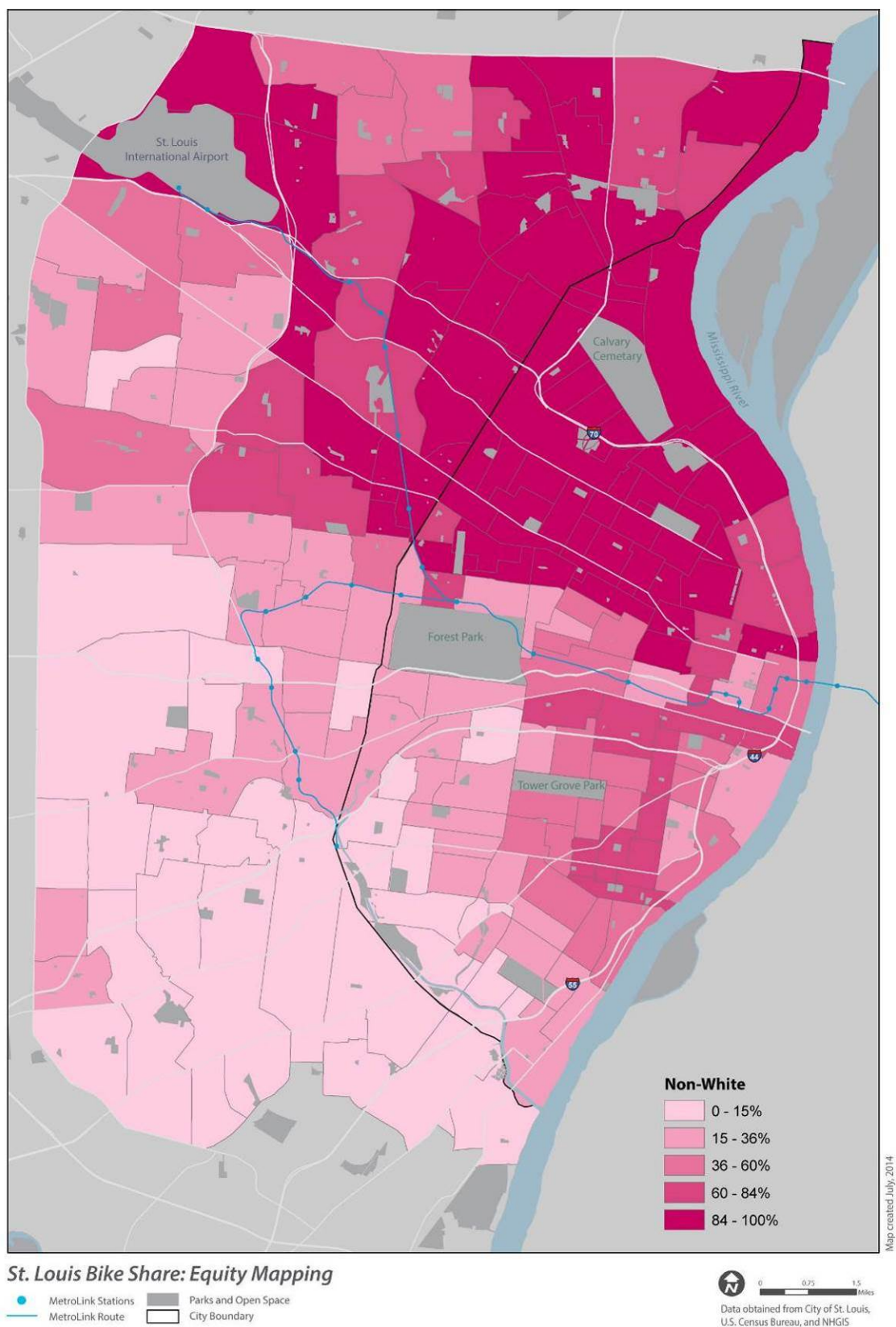
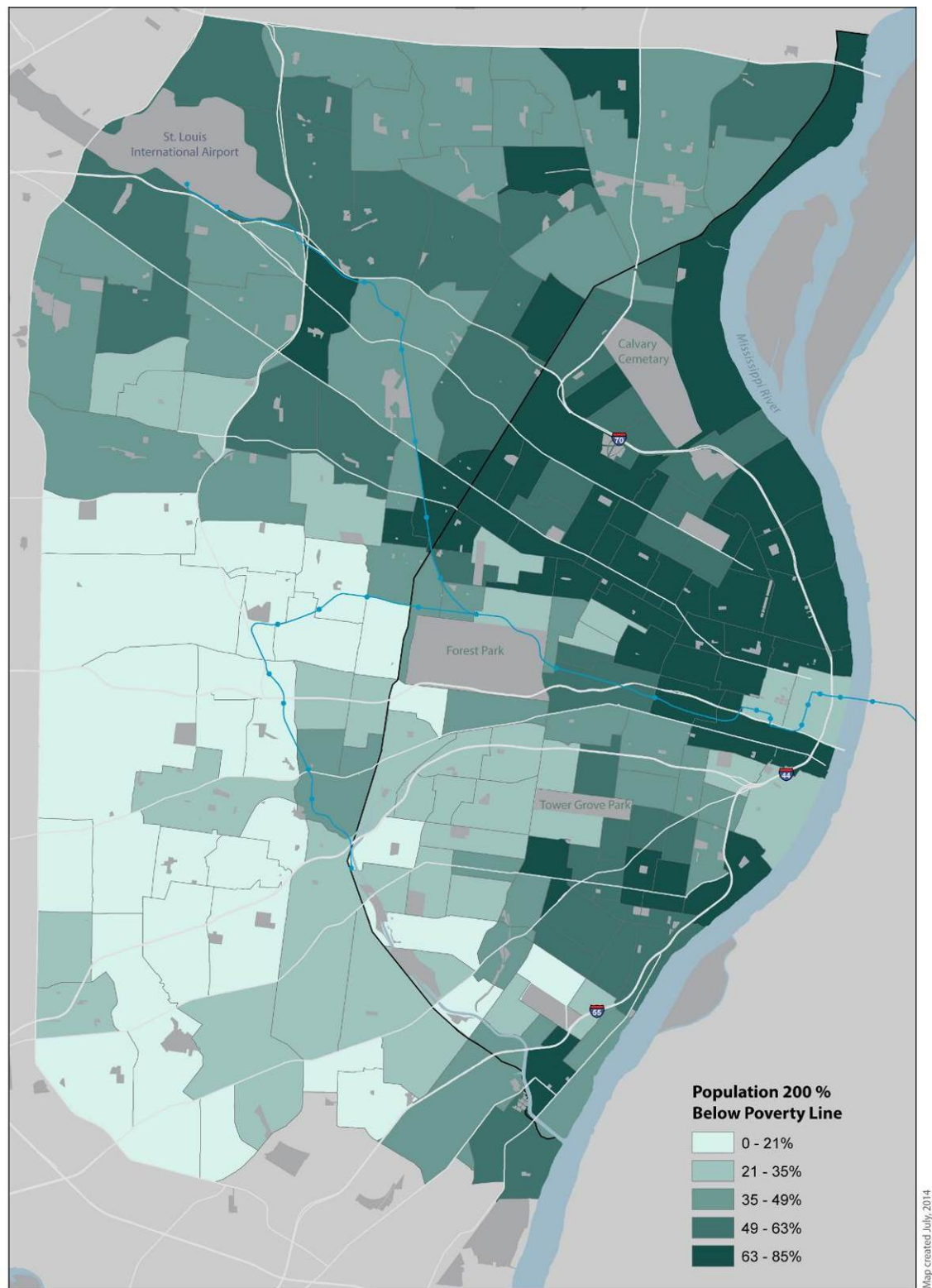


Figure 25: Equity map layer 1: Percentage of population representing people of color



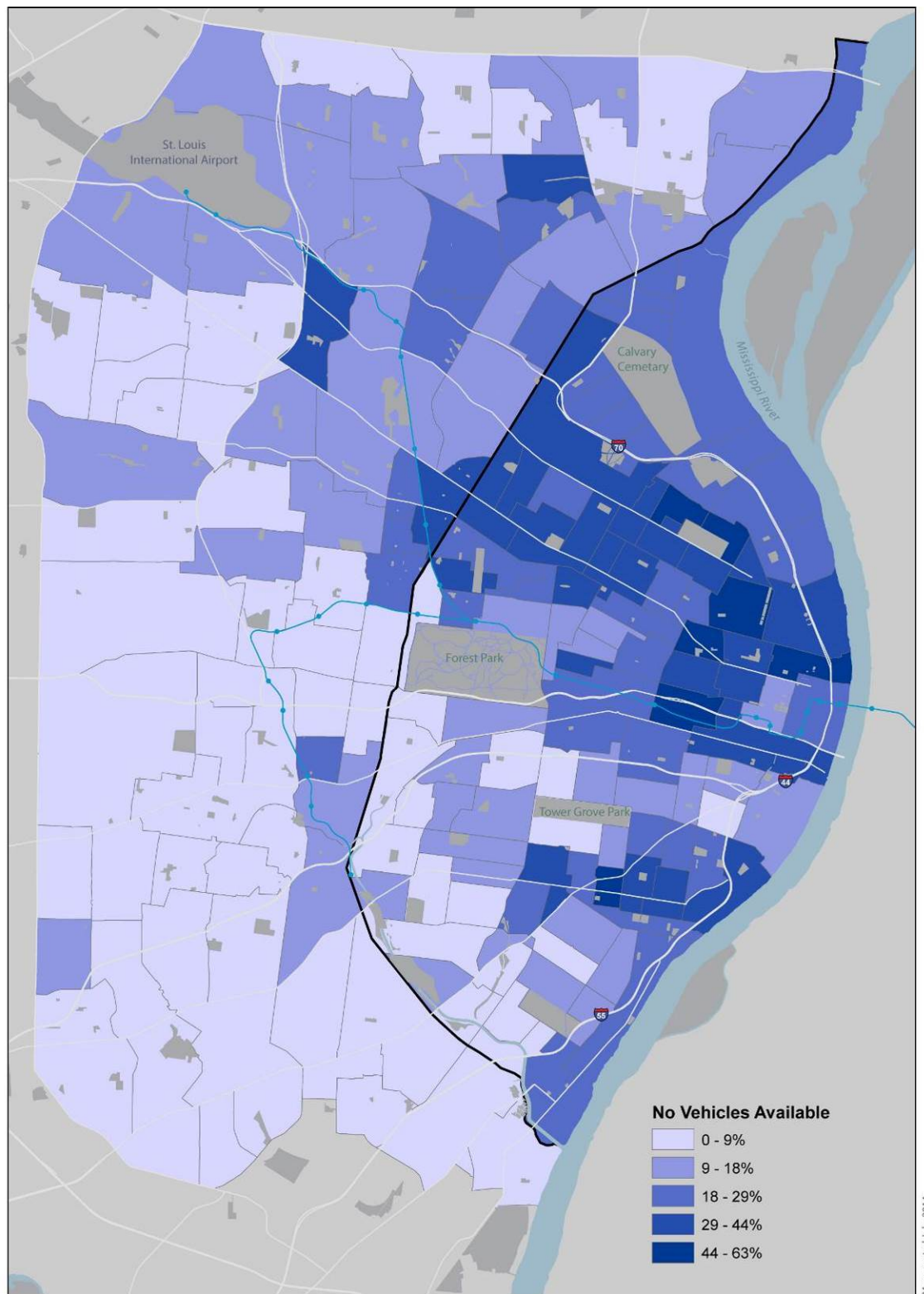
**St. Louis Bike Share: Equity Mapping**

● MetroLink Stations
 ■ Parks and Open Space  
— MetroLink Route
  City Boundary

0 0.75 1.5 Miles  
 Data obtained from City of St. Louis,  
 U.S. Census Bureau, and NHGIS

Figure 26: Equity map layer 2: Percentage of households below 200% of poverty level





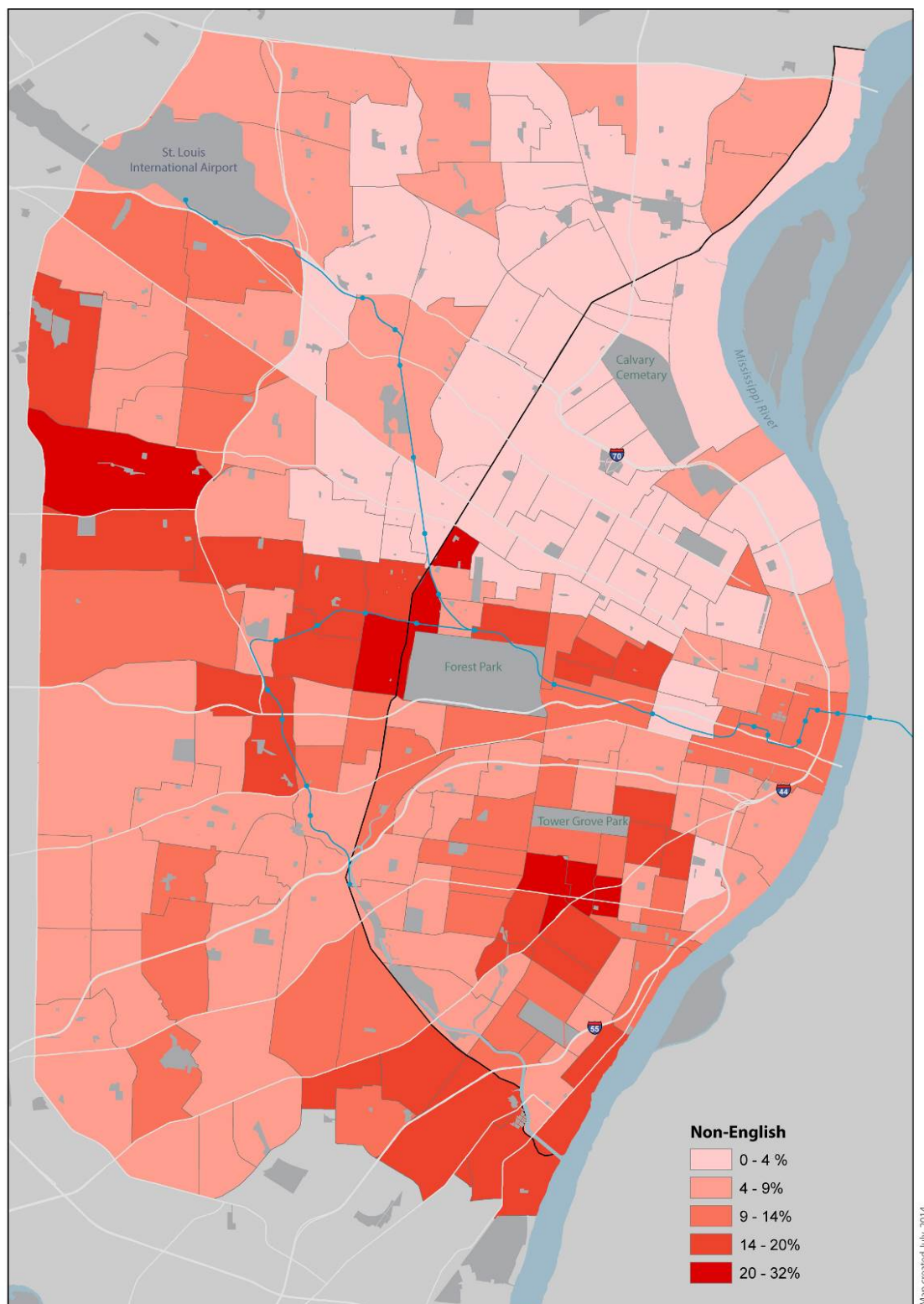
### St. Louis Bike Share: Equity Mapping

● MetroLink Stations
  Parks and Open Space  
— MetroLink Route
  City Boundary



Data obtained from City of St. Louis,  
 U.S. Census Bureau, and NHGIS

Figure 27: Equity map layer 3: Percentage of households with no automobile available for daily use



**St. Louis Bike Share: Equity Mapping**

● MetroLink Stations     Parks and Open Space  
— MetroLink Route     City Boundary

Data obtained from City of St. Louis,  
 U.S. Census Bureau, and NHGIS

Figure 28: Equity map layer 4: Percentage of non-English speaking population



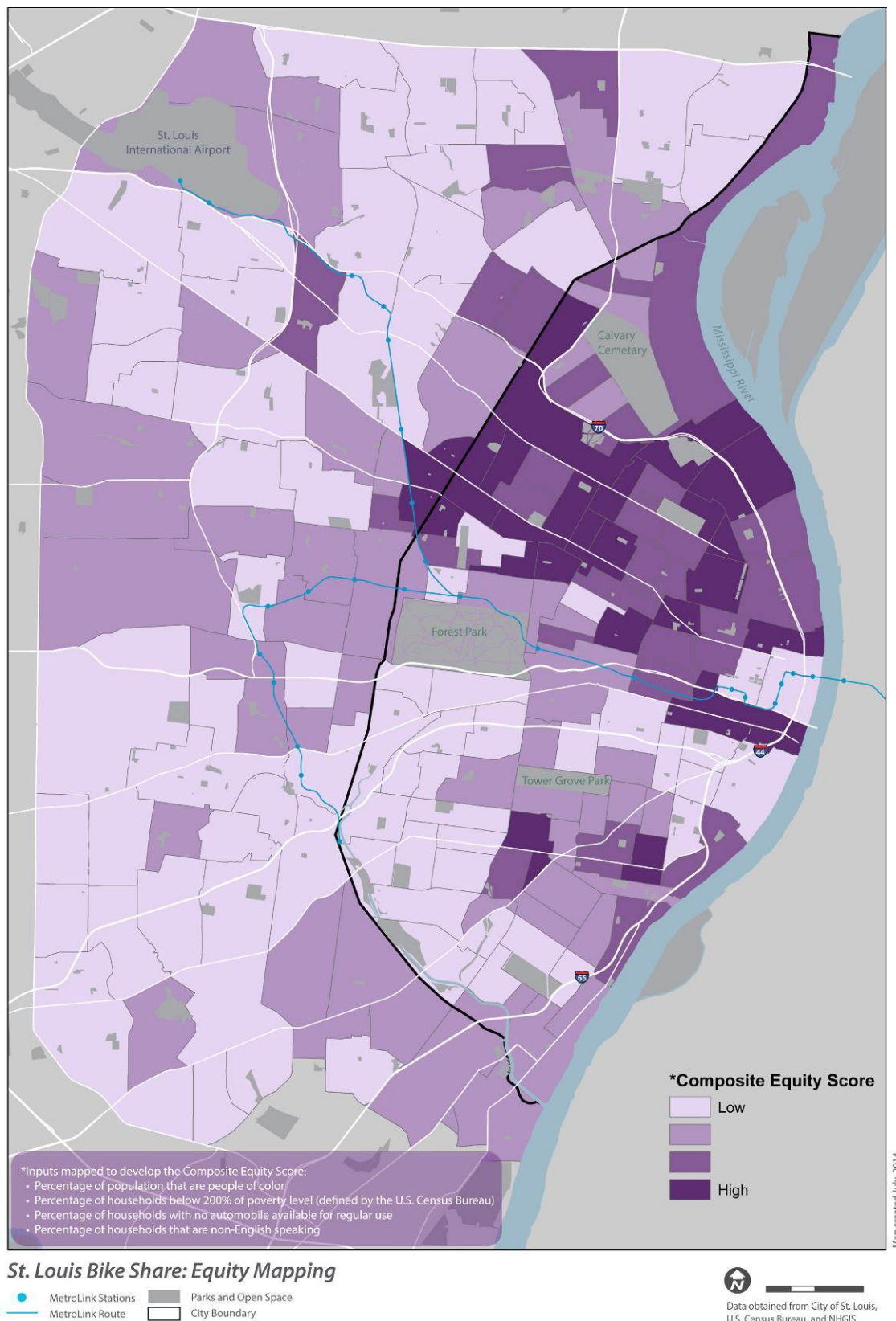


Figure 29: Composite equity map showing a combination of all four layers

## 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. Early on in the bike share planning process, members of the Technical Advisory Committee, Citizen/Business Advisory Committee and the general public were asked to suggest potential bike share station locations using an on-line mapping tool available on the project web site. Hundreds of suggested locations were recommended. Figure 30 shows that suggested station locations roughly mirrored the demand analysis mapping with dense clusters of stations in downtown St. Louis, in Grand Center, in and around Forest Park and in the Delmar Loop. 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 on pages 65-67.

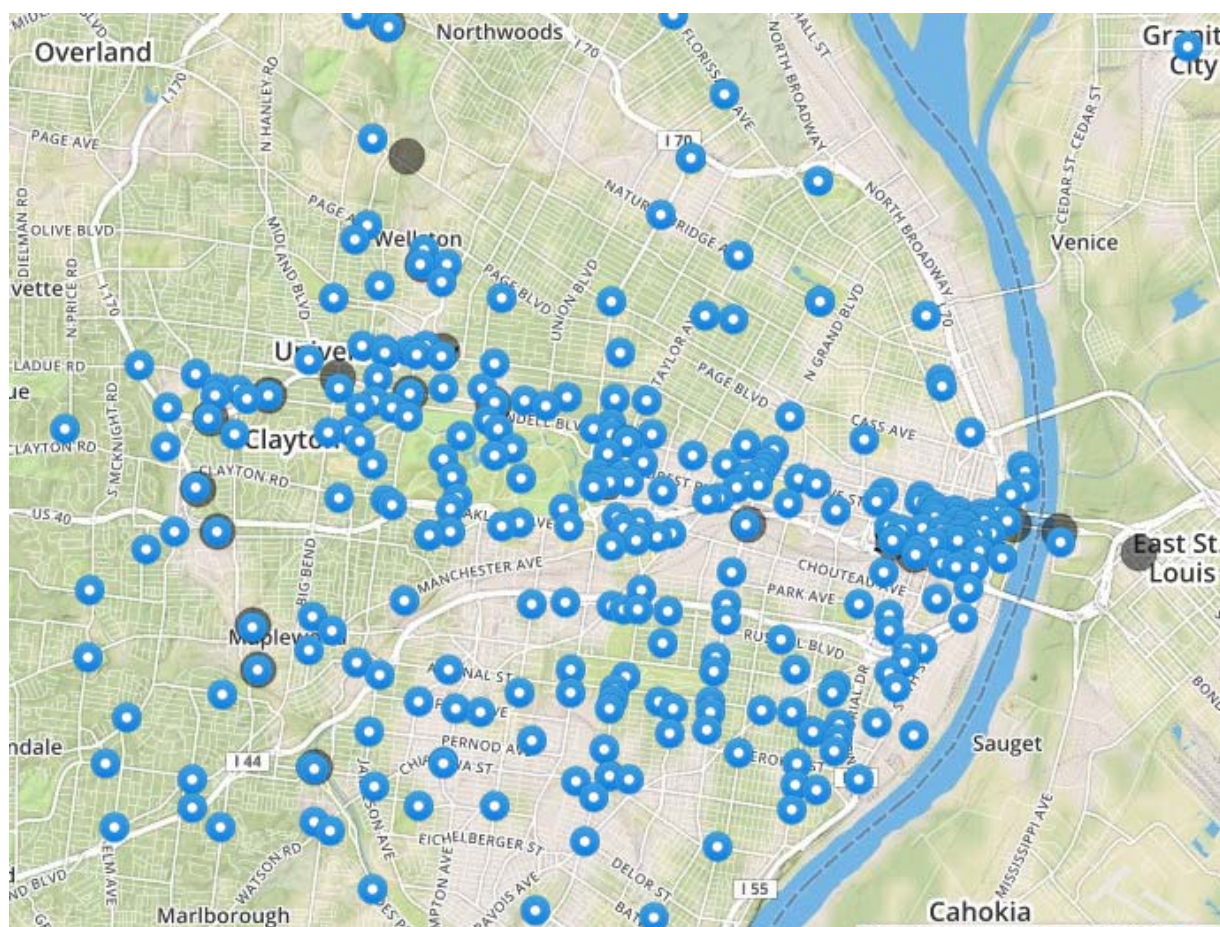


Figure 30: December 2014 screen shot of suggested bike share station locations from the project web site

In addition to the on-line mapping tool, more than 300 community members provided input on the preferred goals for the bike share program via a survey found on-line and handed out at events and meetings. The prioritized list of goals is included in Section 6 of this study. This input helped to inform the recommended bike share service area related to capturing MetroLink stations and key MetroBus



transfer centers, providing service to visitor destinations in Forest Park and ensuring that low-income neighborhoods are served by the early phases of the bike share system.

## Station Spacing

From this point forward, the term bike share “station” could mean either a heavy, steel-plate based station with electro-magnetic docking units, or a cluster of analog bicycle racks to form a station-like hub for free-floating, “smart-lock” bike share bikes (It is important to note that a system utilizing the latter remains untested at a city-wide scale, but has the potential to serve the needs of a bike share program in the St. Louis region.) In both cases, a kiosk and display panel would accompany each station and eight to ten bicycles, on average, would be available within 14 to 18 docking points or racks.

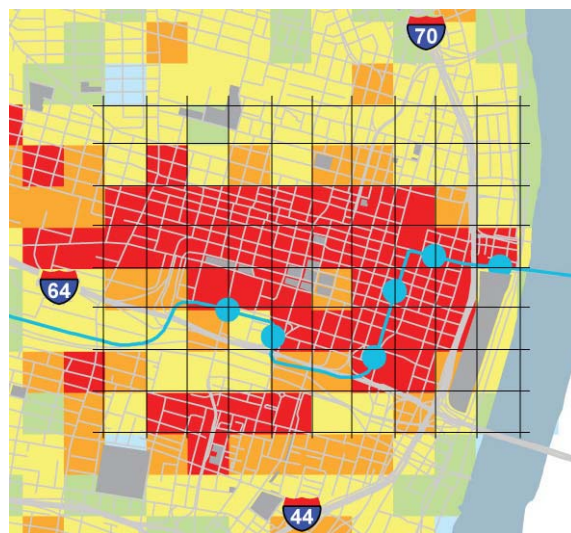


*Typical bike share station with steel plates and electromagnetic docking points (Madison B-Cycle)*



*Cluster of analog bike racks reserved for self-locking bike share (Phoenix Gr:d bike share, via Flickr)*

Within the defined service area, there is a desirable spacing of stations of approximately  $\frac{1}{4}$  mile (1320 feet) apart from each other. This represents a station density of at least 16 stations per square 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. 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, frequently as far as  $\frac{1}{2}$  mile, on rare occasion more. Portions of the bike share service area—primarily downtown St. Louis and the Central West End—will feature the ideal density discussed above, while others will range from four to six stations per square mile. In some areas, the network may take a more



*Figure 31: Downtown St. Louis with 1000'x1000' grid layered on top of the bike share demand map*

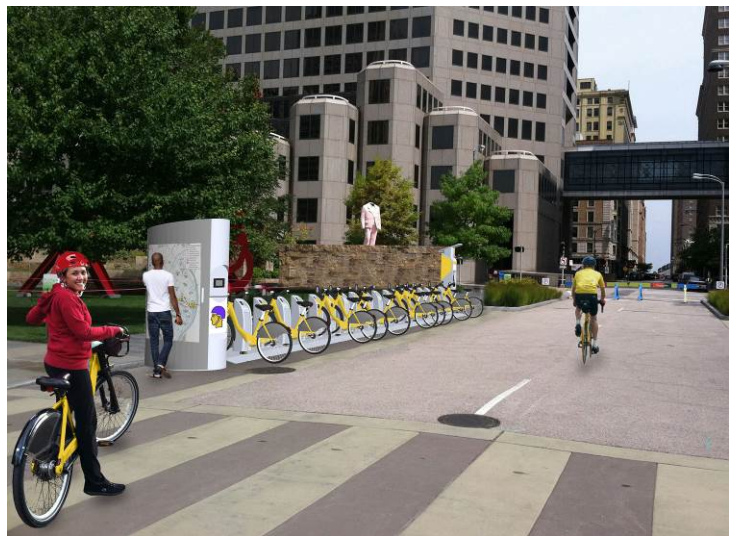
“nodal” approach as a small cluster of stations  $\frac{1}{4}$  mile apart may form around a key destination—such as a MetroLink station or business district—and be separated from others by a  $\frac{1}{2}$  mile or more. In aggregate, the nine square mile Phase I service area will feature an average density of approximately seven stations per square mile.

Setting a station grid at  $\frac{1}{4}$  mile intervals on top of the demand map sets the stage for the rough placement of bike share stations. In reality, however, the recommended number of stations within an area of high demand does not match each of the grid points. The estimated number and location of stations diverges from the ideal grid due to:

- The varying nature of high, medium and low demand areas
- Disruptions in the land-use pattern
- Physical and psychological barriers to bicycle travel (busy arterials and interstates)
- Geographic location of destinations in which bike share stations are desired
- Available funding that precludes ideal station density until future phases

In addition, equity considerations are taken into account which can further alter station placement in order to accommodate sites that may not be in the highest demand areas. **What is critical is to maintain a contiguous service area that minimizes the number of stations that sit more than  $\frac{1}{2}$  mile apart from another.** 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.

In the case of bike share equipment that allows for utilization and lock-up anywhere within the overall service area—so-called “smart lock” systems—efforts will need to be taken to encourage users to return bikes to designated station/hub locations. This can be done through a pricing mechanism that requires a modest fee for any bike parked and locked outside of a station site, and/or beyond the designated service area. (Note that as of December 2014, only two modest-size systems employing “smart lock” equipment have been deployed, and for less than two months.) Whether a more robust station based system or a smart lock system is ultimately deployed in the St. Louis region, what is critical is that a geographically-defined service area with an appropriate station density of roughly  $\frac{1}{4}$  mile spacing ( $\frac{1}{2}$  mile maximum) be firmly established.



*Potential bike share station at Citygarden will likely be a popular station with both downtown residents, employees and tourists alike*

## Phasing Plan

The proposed phasing plan was developed by incorporating the findings from the Demand, Equity 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 a lot of media attention and provide coverage to a multitude of destinations and dense, mixed-use and active areas of the region. To increase the probability of success, it is also critical that the initial launch of bike share include high-profile areas and destinations where the high levels of use are more likely to draw exposure to larger groups of people. Because of this, it is strongly recommended that the first phase of bike share include downtown St. Louis and Forest Park. That ensures stations at highly brandable sites such as the Gateway Arch, Busch Stadium, Citygarden or the St. Louis Art Museum.

The proposed roll-out strategy for the St. Louis region is shown on the following pages and includes:

- **Phase I** (60 stations with 540 bikes): the recommended initial launch area covers approximately over nine square miles in downtown St. Louis, Midtown, the Central West End, Forest Park and Washington University's Danforth campus. Also anticipated are a small number of stations in the Grove, the Delmar Loop, Carr Square, Vandeventer and Academy neighborhoods.
- **Phase II** (30 additional stations with 270 bikes): the second phase will expand the bike share service area to Downtown Clayton and to St. Louis neighborhoods to the north and south including potential stations in Lafayette Square, Soulard, Shaw, Old North St. Louis, JeffVanderLou and the West End. The recommendation for 30 additional stations does not include possible infill stations within the Phase I service area due to interest from potential station sponsors or discrete areas of high demand to warrant an additional station.
- **Phase III:** subsequent phases are expected with a bike share program in the St. Louis region but an anticipated number of stations and bikes is much harder to estimate because of variables related to the success of Phases I and II and available funding. However, possible Phase III expansion could occur in areas such as:
  - small clusters of stations along MetroLink's Blue and Red Lines (North Hanley, UMSL-North and South, Rock Road, Richmond Heights, Brentwood, Maplewood and Sunnen)
  - gradual expansion further into North City, including The Ville and Kingsway East
  - gradual expansion into South City neighborhoods such as the Hill, Tower Grove East and Benton Park

The decision to expand beyond the relatively-robust 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, few crashes/casualties, neighborhood and corporate requests for service area expansion, and ongoing financial performance. 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 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 sufficient funds are in place to launch and sustain operations. Lower demand areas must recognize that entry into the system will be more difficult.



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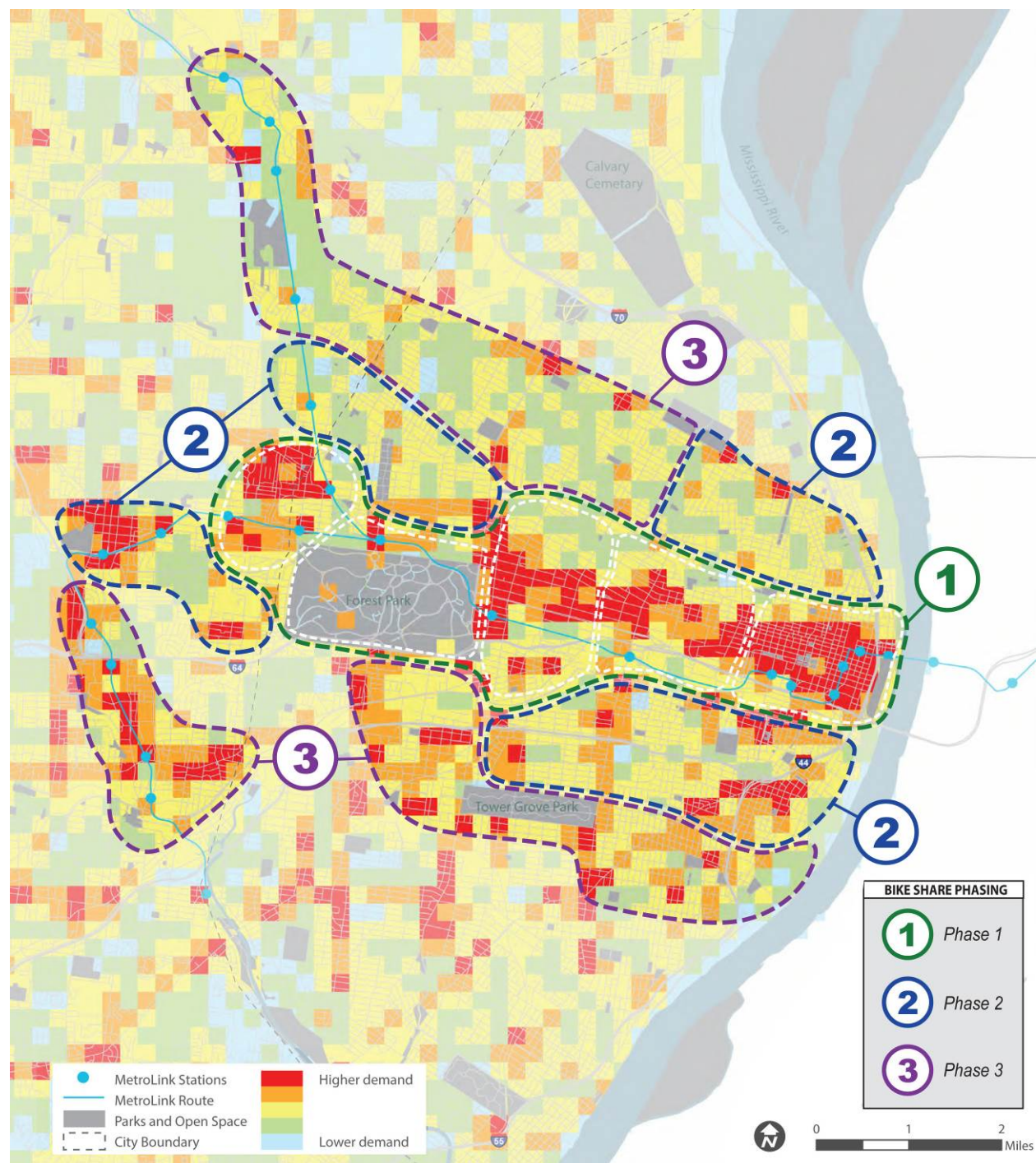


Figure 33: Bike share phasing map illustrating Phases 1, 2 and 3 on top of the bike share demand map

## Station Siting Guidelines

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

Station locations should be highly visible and accessible and need to consider other modes of travel (e.g., they should not impede pedestrian circulation or be placed in bus zones or block building entrances). There may be opportunities to place stations under existing cover, although stations do require a certain amount of vertical clearance and solar access. Station sites also need to be accessible by motor vehicle, which allows small crane trucks and vans to both install the station, and to provide rebalancing of bicycles during peak periods.

The physical space occupied by a station will vary depending on the equipment selected and the number of docking points at each station. Modules generally come in five-foot or ten-foot lengths that accommodate two or four docking points (or bike racks) each, respectively. In nearly all cases, six feet of station depth will be needed to accommodate the length of a parked bicycle within the station. In some cases, orienting racks or docks at a 45-degree angle can save 12”-18” of station depth.

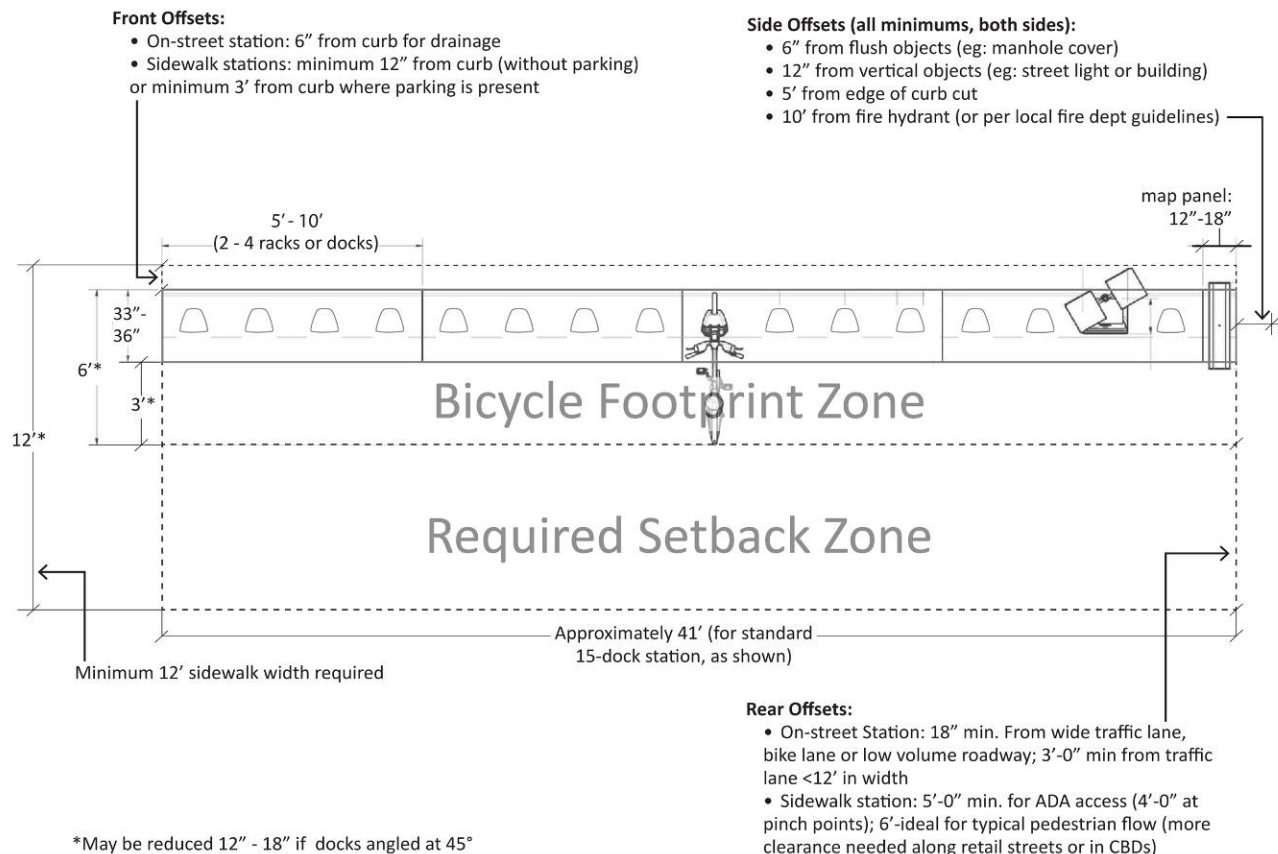


Figure 34: Graphic diagram showing the spacing and offset needs for a typical bike share station



is required behind the bike to allow users to pull the bike out from the station and reorient it in the desired direction of travel. As an example, per the diagram above, a typical 15 dock station (plus a payment kiosk and map panel) would be approximately 41 feet in length by six feet in width. This does not include painted edge lines, wheel stops and flexible bollards around the edges of the station which are recommended for additional visibility for motorists (see graphic below).

Examples of typical station placements are shown on the following pages using possible station locations in greater St. Louis and described below:

- **On-street station sites:** Because bicycles are considered vehicles, there is a certain logic to placing bike share stations on-street. Doing so requires careful consideration of the spatial requirements to ensure a safe and comfortable environment for users however. In many cases, on-street stations require the removal of metered parking spaces, so any impact to revenues will need to be considered.

Stations require anywhere from 30 feet (for a minimum 10 dock station) to 100 feet (for a station of up to 40 docks or bike racks – the expected maximum station size in St. Louis). This represents two to five vehicle parking spaces. Although a bike share station can park more people in the same space (up to 40 bike share parking docks will fit in the same space as five motor vehicle parking spaces), conversion of parking can be a controversial initiative, and thorough outreach to adjacent businesses and local business improvement associations will be necessary. In other cities, many business owners consider the bike share stations to be beneficial by bringing additional customers to the district, along with “branding” an area as progressive and green. Other considerations for on-street installations include:

- Protection: there is no one-size-fits-all solution to protect a station from moving traffic. Some cities require little to no protection, whereas others require engineering treatments such as painted end treatments, wheel stops, and flexible delineator posts. Typically, on-street



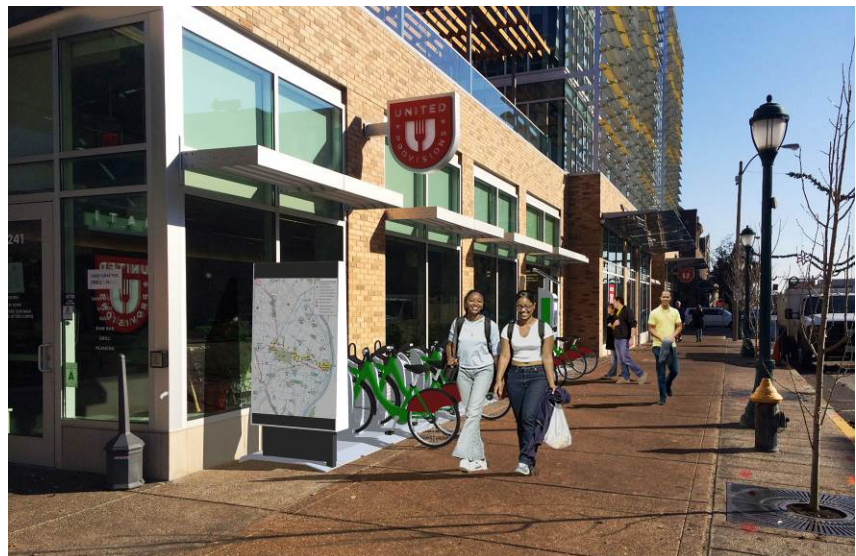
*Example on-street bike share station on Maryland Avenue at the intersection of N. Euclid Avenue in the Central West End*



*To avoid user conflicts with the dedicated bus lane, bikes can be turned to orient them towards the curb*

station installation next to a bike lane or buffer is preferred, but depending on the volume and speed of traffic, parking lanes eight feet wide or wider can be acceptable for on-street installations.

- Orientation: typical bike share station orientation is to place the front wheels adjacent to the curb, so any bikes can be removed and repositioned to join the flow of adjacent traffic. However, some cities rotate the stations so the rear wheel point to the curb, allowing users to access a bike without having to back out into motor vehicle traffic. This can be an effective strategy, especially when there is not a buffer or bike lane immediately adjacent to the station. It's important, however that at least 18" (24"-30" ideally) be left between the edge of the rear wheel and the curb so there is space for maneuvering.
- Clear zones: stations cannot be placed in transit lanes, in off-peak parking lanes (that convert to moving traffic lanes during peak hours), or in other clear zones. Potential displacement of bus stops, loading zones, and other curbside uses needs to be considered as well.
- Metered parking: the City of St. Louis and individual municipalities in St. Louis County would need to provide direction on whether metered parking replacement would be acceptable and the terms of its use. Some cities require that metered parking loss be minimized and that the owner/operator reimburse the city for any lost revenue, whereas other cities have allowed metered parking conversion and write off the revenue impact as an "in-kind" contribution.
- **Off-street/sidewalk station sites.** Placing bike share stations on sidewalks creates a comfortable environment for users to access a bike without concern for passing traffic. With bikes parked, the stations themselves are typically six feet deep. Docking points or bike racks (for "smart lock" systems) can be rotated 45 degrees to save space, though the trade-off is that fewer docks can fit within the anticipated linear length of a typical station. At a bare minimum, station footprints require an additional five feet for pedestrian passage to meet ADA requirements. In many cases however, five feet could be inadequate for the volume of pedestrians along a given street. On commercial streets with retail store-



*Example sidewalk bike share station location along Delmar Boulevard adjacent to Washington University's residence hall building*



fronts, 8' clearance is more desirable and perhaps more in parts of downtown or the Central West End where pedestrian volumes are far higher.

It is expected that sidewalk installations of bike share station will occur without the need for permanent changes to the sidewalk. In some cases however, small pieces of street furniture such as trash bins or benches may need to be relocated in order to provide the needed space at a key location. Where street reconstructions or major sidewalk repairs are scheduled—as part of a large redevelopment project, for instance—a long curb extension or a building setback would be desirable to accommodate bike share.

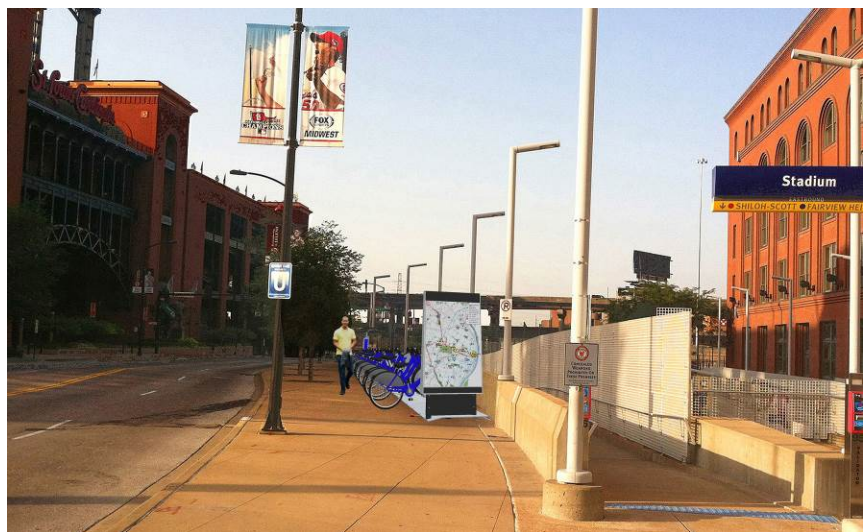
- **Off-street/plaza station sites:**

stations in publicly-owned plazas, public spaces, and in parks will require consultation with the relevant city agency or a non-profit group such as Forest Park Forever. For stations on privately-owned lands, agreements would need to be negotiated between the owner/operator and the individual land owner. For stations on private property, it is critical that the sites be visible from an adjacent public street and publicly accessible at all times. In either case, the appropriate setbacks will need to be considered, along with the need to accommodate events and programming that frequently occurs in public spaces in central business districts.



*Example bike share station at the edge of Ruth Porter Mall Park plaza along Delmar Boulevard*

- **On or off-street station sites next to transit:** as discussed in other sections of this study, there is a synergy between transit and bike share. It is anticipated that future bike share stations will be located adjacent to most MetroLink stations and bus transfer centers. To enhance multi-modal connectivity, the bike share station should be clearly visible from one of the



*Example sidewalk bike share station location at Busch Stadium, adjacent to the MetroLink station*

primary entries to the transit station and easily accessible without having to cross a major street, if possible. Stations should also be as large as possible to accommodate the high peaks of demand that coincide with peak commute periods. This will minimize the need for rebalancing which is frequently most acute during the morning and evening weekday rush hours. Bike share sites at MetroLink stations near major destinations (e.g., Busch Stadium, Scottrade Center and Forest Park, in particular) should be the largest in the system to accommodate both commuter peaks and regularly-scheduled, or special, events at the adjacent venues.



## 9. 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?

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 8.

*Table 8: Bike Share Business Models in North America*

Name	Stations / Bikes	Ownership of Capital Infrastructure	Operations
Divvy, Chicago	300 / 3,000	Public: Chicago Department of Transportation	Private Operator (Alta Bicycle Share)
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: individual cities of Boston, Cambridge, Somerville and Brookline	Private Operator (Alta Bicycle Share), who has separate contractual agreements with each city within the network
Kansas City B-Cycle	12 / 90	Non-profit: Bike Share KC	Non-profit Operator (Bike Share KC)
Madison B-Cycle	35 / 350	Public: City of Madison	Non-profit Operator (Madison 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)

In general, the four primary business models are:

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).



*Model 1. Boston Hubway*

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.



*Model 2. KC B-cycle (from [www.bikesharekc.com](http://www.bikesharekc.com))*

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.



*Model 3. Seattle Pronto! bike share*



*Model 4. Miami Beach DecoBike*

The advantages and disadvantages of the four major models are summarized in Table 9 in terms of ownership of assets, operating responsibility, agency role, transparency, share of profit and risk, use of operating expertise, fundraising responsibility, expansion potential, and staff capacity / organizational interest. Table 10 and Table 11 provide further detail on the pros and cons of either ownership or operations separately.

Table 9: 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: 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 11: 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 for St. Louis

Due to a variety of factors, the recommended model for the St. Louis region is non-profit ownership with operations performed by the non-profit or contracted out to a private bike share operations company.

Ownership: Given the constrained fiscal reality for most local governments and because the recommended service area will cross municipal boundaries, it will be difficult for either the City of St. Louis or St. Louis County (either the County itself or individual jurisdictions) to take full ownership of the program. Regional agencies such as the Bi-State Development Agency (also known as Metro) or Great Rivers Greenway District are unlikely to be in a financial position to fully own the program, and may not see it within their missions to do so. However, a partnership of various agencies and

organizations, both public and private, could collaborate and collectively work together to bring bike share to the St. Louis region.

Bike share ownership is a better fit for a non-profit 501(c)3, whose Board would be comprised of key political, corporate, institutional and community leaders and organizations. Comparable examples are Puget Sound Bike Share (Pronto Cycle Share) in Seattle, Nice Ride Minnesota in Minneapolis/St. Paul and San Antonio B-Cycle. This model 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

Of critical importance, is that a high-level representative from the City of St. Louis—ideally the Mayor’s office, department representative or a City Alderperson—be an active leader on the Board. In addition, a high level representative from St. Louis County, from either the County Executive’s office or a County Councilman would be crucial as well. In some locales, the launching of bike share has been delayed due to lack of high-level leadership. Without 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 community that perhaps bike share is not a high priority for the Mayor’s office or the City and County. Other critical Board members would include: major funders/sponsors, public works leadership, transit agency leadership, and non-profit partners, such as Trailnet or Downtown STL. Without Board involvement from most of these key representatives, a non-profit risks being ineffective at securing the necessary funding for capital and operations costs. A non-profit may also lack the experience with grant writing or other key avenues for securing state or federal funding.

In many cases, the non-profit will require that a public agency serving on the Board become the designated grant recipient when seeking federal transportation grants. The recipient has the option to include a provision that, in the event of failure of the bike share system, the public agency would have no obligation to continue operations. In that case, it is possible that funds from the potential sale of the bike share equipment would need to be repaid to the federal granting agency.

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 and municipalities 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 donating money to a non-profit.

Operations: Examples of non-profits successfully operating larger bike share systems include NiceRide Minnesota and Denver B-Cycle. Most non-profit operators, however, work with systems much smaller than what is proposed for St. Louis. This includes highly localized systems with fewer than 250 bicycles, such as Indianapolis Pacers Bike Share, Salt Lake City GREENbike and Kansas City B-Cycle. Due to the

size and regional-nature of the potential system in St. Louis, a good option is to contract operations to an experienced vendor. By taking advantage of the experience and economies of scale coming with a qualified operations vendor, this 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 St. Louis.

## 10. System Costs

There are four major costs associated with a bike share system in the St. Louis region: 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. This could include either a heavy, steel-plate based station with electro-magnetic docking units, or a cluster of analog bicycle racks to form a station-like hub for “smart-lock” bike share bikes.

An additional assumption about the cost estimates below is that they do not include the potential costs of integrating a combination bike share and transit pass, a desirable feature of a bike share program in St. Louis. At this point in time, there are many unknowns related to the back-end software required to facilitate the integration. The Bi-State Development Agency (Metro) is currently in process of developing a smart card fare payment system and it could potentially incorporate bike share into the system architecture. There could be considerable costs however, in the range of hundreds of thousands of dollars (not including on-going administrative and software maintenance costs). That would depend on the desired level of flexibility and control and the integration of payment options into the selected bike share equipment. What to charge users seeking an annual or 24-hour combo pass and revenue-sharing options will impact revenue generation for bike share. This too is left out of the business model and revenue projections found in Sections 4 and 5.

### 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 the St. Louis region, launch costs are expected to be a onetime cost of \$864,000 (or \$1,600 per bike X 540 bikes) for Phase I and \$432,000 for the Phase II expansion.**

### 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 (“high” cost range for steel plate/dock-based stations vs. “low” cost range for bike-rack based stations with smart-locking bikes)
- 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 the St. Louis region, Capital costs are expected to range from \$1.8 - \$3.3 million for the proposed 60 stations for Phase I and \$0.9 – 1.7 million for 30 additional stations in Phase II. (note: does not include potential price changes related to inflation)**

## Administrative Costs

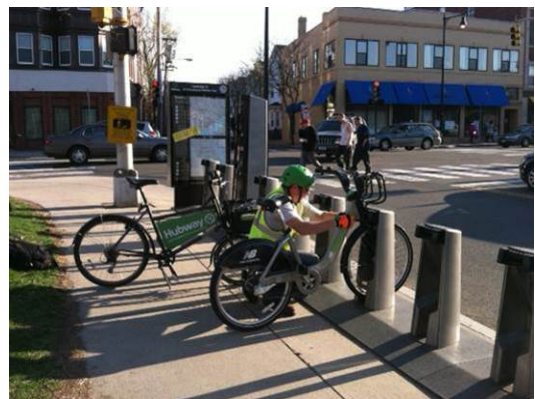
There will be costs associated with administering the program by the equipment owners. For any type of governance model, a total of \$30,000 has been budgeted for this service as the lead-in to the Phase I launch, with \$15,000 budgeted for administrative costs associated with launching Phase II. These costs relate to recruiting and securing full and part-time staff and the special marketing efforts that are most prevalent during launch year and the build-up to the Phase II expansion.

Longer-term, the non-profit or private company that owns and/or operates the bike share program will have administrative costs associated with staff positions, marketing, and general expenses. These are included in operating costs as described below.

## 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, snow removal, removing litter and graffiti, etc.
- **Bike maintenance:** including regular inspection and servicing of bikes as well as maintaining equipment inventory, etc.
- **Rebalancing:** typically the highest operating cost for the system is the staff time and equipment associated with moving bikes from full to empty stations.
- **Customer service:** providing a responsive customer interface for enquiries and complaints as well as performing marketing and outreach to new and existing customers.



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

- **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/or operator and the individual cities—e.g., St. Louis or Clayton—in which bike share is expected to be operational. 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 other questions. 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. Operational costs for analog bike rack stations and “smart lock” bicycles are likely to be in the same range but such costs are unknown because a city-wide system has been operational in only two cities in the US and only for a matter of weeks.<sup>9</sup>

For the proposed system of either technology in the St. Louis region, \$105 per dock per month is used as an average for operating costs. For Phase I, this amounts to \$1.3 million per year for a 1,026 dock system. (A dock-to-bike ratio of 1.8-2.0 is recommended for bike share, so 1,026 docking points will accommodate the 540 bikes anticipated for Phase I.) An additional \$0.6 million for 513 additional docking points per year will be needed for the Phase II 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 the St. Louis region for both Phase I and II are shown in Table 12 and Table 15 below. Note that capital, launch, and administration costs occur in the year prior to operations, i.e. these costs occur in Year “0” for a system whose operations begin in Year 1.

*Table 12: Five-Year Cost Estimate for St. Louis Bike Share – LOW cost equipment*

year	0	1	2	3	4	5
# of stations/hubs	60	60	60	90	90	90
# of bikes	540	540	540	810	810	810
# of docks/racks (1.9 per bike)	1026	1026	1026	1539	1539	1539
launch costs	\$864,000	\$0	\$0	\$432,000	\$0	\$0
capital costs (low)	\$1,800,000	\$0	\$0	\$900,000	\$0	\$0
admin. costs	\$30,000	\$0	\$0	\$15,000	\$0	\$0
operations costs	\$0	\$1,292,760	\$1,292,760	\$1,939,140	\$1,939,140	\$1,939,140
<b>Low Cost sub-total</b>	<b>\$2,694,000</b>	<b>\$1,292,760</b>	<b>\$1,292,760</b>	<b>\$3,286,140</b>	<b>\$1,939,140</b>	<b>\$1,939,140</b>
<b>Low Cost Cumulative</b>	<b>\$2,694,000</b>	<b>\$3,986,760</b>	<b>\$5,279,520</b>	<b>\$8,565,660</b>	<b>\$10,504,800</b>	<b>\$12,443,940</b>

<sup>9</sup> This will change in 2015 as city-wide, “smart lock” bike share systems are planned for launch in Hoboken NJ, Boise, Idaho, Pittsburgh and Hamilton, Ontario.

Table 13: Five-Year Cost Estimate for St. Louis Bike Share – HIGH cost equipment

year	0	1	2	3	4	5
# of stations/hubs	60	60	60	90	90	90
# of bikes	540	540	540	810	810	810
# of docks/racks (1.9 per bike)	1026	1026	1026	1539	1539	1539
launch costs	\$864,000	\$0	\$0	\$432,000	\$0	\$0
capital costs (high)	\$3,300,000	\$0	\$0	\$1,650,000	\$0	\$0
admin. costs	\$30,000	\$0	\$0	\$15,000	\$0	\$0
operations costs	\$0	\$1,292,760	\$1,292,760	\$1,939,140	\$1,939,140	\$1,939,140
<b>High Cost sub-total</b>	<b>\$4,194,000</b>	<b>\$1,292,760</b>	<b>\$1,292,760</b>	<b>\$4,036,140</b>	<b>\$1,939,140</b>	<b>\$1,939,140</b>
<b>High Cost Cumulative</b>	<b>\$4,194,000</b>	<b>\$5,486,760</b>	<b>\$6,779,520</b>	<b>\$10,815,660</b>	<b>\$12,754,800</b>	<b>\$14,693,940</b>

## 11. 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 the St. Louis region is presented in Section 12.

### 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 will provide a significant level of income.

Forecasting user-generated revenues for a bike share program in the St. Louis region 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 time period. Fees are charged to users who exceed the pre-established free-ride period, and increase exponentially with each additional 30-minute period of use.

The logic of the rate system is to: (1) make annual membership attractive to the general public, (2) make the rates comparable to other North American bike share system rates, (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 many 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. (see Equity recommendations in section 7 to see alternate means to purchase a membership without doing so online or using a credit card)

Table 14 shows a summary of membership options and pricing for North American bike share systems (note that tax is treated differently for different systems – some of the prices below do not include tax, some are tax-inclusive).

The proposed rate schedule for the St. Louis region is also shown in Table 14 and has been developed from the rate structures adjusted for the cost of living in other cities, along with input received from the community survey which asked people to project how much they would be willing to pay for a bike share membership. While the cost of living is generally less expensive in St. Louis relative to other East Coast cities, it is on par with other Midwest and Southeast cities that offer bike share (Chicago being one exception). Cities with similar costs of living are sustaining the suggested rates of \$75 or more for annual memberships, \$25 monthly, \$15 for a 72-hour pass, and \$7 for a 24-hour pass. This provides the foundation for a proposed membership and casual user fees in the St. Louis region. It should also be noted that there is significant interest in developing a combined bike share and transit user pass. Although there are some technological hurdles to jump, if this becomes a realistic scenario, the proposed membership and user fees will need to be developed in close coordination with the Bi-State Development Agency. For example, a 24-hour bike share/transit pass for \$10-12 would be a strong incentive to discourage visitors from using automobiles for their casual trips throughout the region.

*Table 14: 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)*

<b>System</b>	<b>Member: Annual</b>	<b>Member: Monthly</b>	<b>Casual: Weekly pass</b>	<b>Casual: 72-hour pass</b>	<b>Casual: 24-hour pass</b>
<b>St. Louis (Proposed)</b>	<b>\$75</b>	<b>\$25</b>	<b>-</b>	<b>\$15</b>	<b>\$7</b>
Chicago Divvy	\$75	-	\$20	-	\$7
Capital Bikeshare (DC)	\$75	\$25	-	\$15	\$7
Chattanooga TN	\$75	-	-	-	\$6
Denver CO Bikesharing	\$80	\$30	\$20	-	\$8
Hubway (Boston)	\$85	\$20	-	\$12	\$6
Madison WI B-Cycle	\$65	-	-	-	\$5
Miami Beach DecoBike	-	\$15-25	-	-	\$4-24
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).

Table 15 summarizes overtime usage fees for North American bike share systems and suggests a proposed rate structure for the St. Louis region.

*Table 15: Usage Fees for North American Bike Share Systems*

System	Usage Fees per Trip (cumulative)				Each 30 minutes thereafter	Max 24-hour charge
	0-30 min	30-60 min	61-90 min	91-120 min		
<b>St. Louis (Member)</b>	<b>\$0</b>	<b>\$1.50</b>	<b>\$4.50</b>	<b>\$10.50</b>	<b>\$6.00</b>	<b>\$80</b>
<b>St. Louis (Casual User)</b>	<b>\$0</b>	<b>\$2.00</b>	<b>\$6.00</b>	<b>\$14.00</b>	<b>\$8.00</b>	<b>\$100</b>
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	-
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.

It is also important to note that the bike-rack based stations with smart-locking bikes model all-but-requires that a price be placed on parking the bike between established station hubs, or outside of the service area entirely. For the Social Bicycle (SoBi) system in Hamilton, Ontario, the operators charge an additional \$3 fee to park a bike between stations within the designated service area, and a steep \$75 fee to park the bike in a remote location outside of the designated service area. This pricing is to discourage users from taking the bike far outside of the service zone and to minimize the expensive service pick-up to return the bike to the designated service area. The bike's built-in GPS enables the operator to locate a locked bike at any particular moment.



*Hamilton SoBi station mock-up (image courtesy of New York-based Social Bicycles)*

## 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 the St. Louis region:

- Introductory membership: 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.
- 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 roughly 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.
- Discount membership drives: systems such as Capital Bikeshare, Denver B-Cycle, and Hubway have offered discounted annual membership through services such as Living Social, Groupon, and others.
- 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 the St. Louis region was based on observed monthly station and user demands in the Hubway system in Greater Boston, CoGo in Columbus, OH, Capital Bikeshare in metro Washington, DC and the Divvy system in Chicago. Although not all of these are considered "peer" cities with St. Louis, 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 to St. Louis.

Use of bike share in the St. Louis region is expected to operate lower than in Washington, DC area, Boston and Chicago, and this has been taken into account in the financial modeling. However, as a Midwestern city with a relatively high-performing transit system, and an increasing use of non-motorized transportation modes (St. Louis's walking mode share is just over 4% and transit mode share is 11% for a combined total of approximately 15%) will help to maintain a respectable use of the bike share system. Compared with a similar-sized midwestern city like Columbus OH or Kansas City, St. Louis has a stronger visitor economy, more-significant destinations and a greater concentration of jobs and housing in some areas.

The model was applied to the proposed Station Location Plan in St. Louis 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 I (60 stations in place at the start of Year 1) and Phase II (an additional 30 stations, assumed in place at the start of Year 3) is presented in Table 16. It shows an annual forecast demand of approximately 217,000 trips in Year 1 ramping up to



approximately 433,000 trips in Year 5. The number of trips taken per bike, per day is expected to start out at approximately 1.10 trips / bike / day in Year 1 and increase to 1.46 trips / bike / day in Year 5. User revenues were estimated by applying the proposed rate structure to these forecasts and are summarized in Table 16 as well. Over five years, user revenues are expected to generate between \$518,000 and \$1,012,000 per year, or \$4.0 million cumulatively.

Table 16: PRELIMINARY Five-Year Usage Forecast for St. Louis Bike Share

	Year 1	Year 2	Year 3	Year 4	Year 5
<i>Trips</i>					
Phase I (60 stations)	217,000	264,000	281,000	314,000	329,000
Phase II (90 stations)	na	na	80,000	97,000	104,000
Total	217,000	264,000	361,000	411,000	433,000
Trips / Bike / Day	1.10	1.34	1.22	1.39	1.46
<i>Annual Members</i>					
Number	2,500	3,100	4,300	5,000	5,100
Trips	164,000	199,000	279,000	318,000	335,000
<i>Casual Users</i>					
Number	25,000	30,600	38,700	43,900	47,700
Trips	53,000	65,000	82,000	93,000	98,000
<i>Revenues</i>					
Annual Memberships	\$188,000	\$233,000	\$323,000	\$376,000	\$383,000
Member Trip Fees	\$15,000	\$18,000	\$25,000	\$28,000	\$30,000
Casual User Subscriptions	\$292,000	\$353,000	\$448,000	\$505,000	\$531,000
Casual User Trip Fees	\$61,000	\$74,000	\$94,000	\$106,000	\$111,000
Projected Refunds	(\$38,000)	(\$38,000)	(\$51,000)	(\$45,000)	(\$43,000)
<b>Total Annual User Revenue</b>	<b>\$518,000</b>	<b>\$640,000</b>	<b>\$839,000</b>	<b>\$970,000</b>	<b>\$1,012,000</b>
<b>Cumulative User Revenue</b>	<b>\$518,000</b>	<b>\$1,158,000</b>	<b>\$1,997,000</b>	<b>\$2,967,000</b>	<b>\$3,979,000</b>
<b>Revenue/bike/year</b>	<b>\$959</b>	<b>\$1,185</b>	<b>\$1,036</b>	<b>\$1,198</b>	<b>\$1,249</b>

## Forecast Validation

Forecasts for the St. Louis region were compared to first-year usage and membership statistics for existing systems in Chicago, Boston, Columbus OH, Denver, Madison, Montreal, Minneapolis, San Antonio, and Washington D.C. for the following metrics:

- Trips / bike / day: the Year 1 forecast for the St. Louis region of 1.1 trips / bike / day is within the range of other systems. This is significantly less than first year statistics for Washington, D.C. CaBi (2.5 trips / bike / day) and Boston Hubway (2.6 trips / bike / day), but roughly on par with modestly well-performing system such as Columbus's CoGo (1.0 trips / bike / day) or Denver (0.9 trips / bike / day). Table 17 includes a comparison with other bike share systems.
- Members per bike ratio: the St. Louis system is expected to have a member-per-bike ratio of nearly 5:1, which is within the range of some bike share systems, but lower than others (see Table 18).
- Trips per member ratio: the St. Louis bike share system is expected to operate at approximately 66 annual trips per member, which is significantly lower than Capital Bikeshare, similar in number to Boston Hubway and a bit higher than Nice Ride Minnesota and Denver B-cycle (see Table 18). One reason the number of annual member trips per year is expected to be relatively robust is the expected high use of bike share coupled with MetroLink trips for many annual members on a nearly daily basis.

*Table 17: Trip Comparison with US Bike Share Systems (Inaugural Season)*

	Year (Season)	Operating Days	Annual Trips	Bikes	Trips / Bike / Day
<b>St. Louis (estimate)</b>	<b>TBD</b>	<b>365</b>	<b>217,000</b>	<b>540</b>	<b>1.10</b>
Chicago Divvy	2013-2014 (1 <sup>st</sup> )	365	1,320,000	2500	2.10*
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
Capital Bikeshare	2010 / 2011 (1 <sup>st</sup> )	365	1,045,000	1,100	2.53

Note: \* - an unusually cold winter and a slow start tended to depress Divvy's trip/bike/day figure

Table 18: Membership Comparison with US Bike Share Systems

	Year (Season)	Bikes	Annual Members (after first full year of service)	Members / Bike	Total Annual Member Trips	Trips / Annual Member
<b>St. Louis</b>	<b>TBD</b>	<b>540</b>	<b>2,500</b>	<b>4.6</b>	<b>164,000</b>	<b>66</b>
Capital Bikeshare	2011 (2nd)	1,100	10,660	9.7	1,045,000	98
Denver	2011 (2nd)	520	2,675	5.1	122,000	46
Hubway	2012 (1st full)	610	3,815	6.3	244,000	64
Madison B-Cycle	2012 (2nd)	290	2,150	7.4	39,000	18
Nice Ride MN	2010 (1st)	600	1,295	2.2	65,000	50
Toronto BIXI	2011 (1st)	1,000	3,750	3.8	-	-

The comparison of predicted statistics for a bike share system in St. Louis 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 Federal Highway Administration (FHWA), Federal Transit Administration (FTA), or Centers for Disease Control and Prevention (CDC), state grants, and local transportation funds.

The FHWA provides a summary of public funding sources in its guide to bike sharing in the US (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)

The table below also summarizes the funding sources used for bike share in the US (FHWA, 2012)

FEDERAL					STATE and LOCAL
U.S. Department of Transportation (USDOT) <sup>59</sup>		Centers for Disease Control (CDC)	Department of Health and Human Services (HHS)	Department of Energy (DOE)	
Federal Highway Administration (FHWA) <sup>60</sup>	Federal Transit Administration (FTA) <sup>61</sup>				
Congestion Mitigation Air Quality (CMAQ)	Job Access Reverse Commute (JARC)				Public Health Grants
Surface Transportation Program: Transportation Enhancements (TE)	Bus Livability Pilot Programs	Health and Obesity Prevention Grant	Communities Putting Prevention to Work <sup>62</sup>	Energy Efficiency Conservation Block Grant <sup>63</sup>	
Transportation, Community and System Preservation Program (TCSP)					
Transportation Investment Generating Economic Recovery (TIGER) Grant	Paul S. Sarbanes Transit in Parks Grant Program				Local Transportation Funds
Nonmotorized Transportation Pilot Program					

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, National Environmental Policy Act (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 Congestion Mitigation and Air Quality Improvement (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 \$2.3 million 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. Other agencies, such as the St. Louis County Health Department or the St. Louis Housing Authority may also get involved, e.g. in Denver, funding from the Denver Housing Authority was used to install two stations at two public housing projects.

It is also possible to leverage state funding by potentially tying together bike share in the St. Louis region with Kansas City’s existing system and potential systems in Springfield, Columbia and perhaps elsewhere. A more-unified name, logo and member card could help to brand a Missouri state-wide bike share program that might elicit additional support from the state Legislature and/or state agencies. Though direct state appropriations might be difficult to come by, the full backing of the state could help bring in additional federal funding or Missouri Department of Transportation grant assistance.

## **Private Foundations**

Private funding sources such as foundation grants, donations, or in-kind support offered by private, non-profit, or philanthropic organizations would form part of a diversified financial strategy. These sources are important in meeting the local match for federal grants or continuing cash flow for operations. In the



St. Louis region, possible sources of funding from Private Foundations include: the Monsanto Foundation, the William Kerr Foundation, the Taylor Family Foundation, the Emerson Charitable Trust, the Express Scripts Foundation, the Foundation for Barnes-Jewish Hospital and the Walton Kroenke 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 St. Louis regional bike share”.

Sponsorship provides a significant funding opportunity in St. Louis 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 the St. Louis region 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.

There are generally four approaches to sponsorship described in Table 19.

*Table 19: Common Bike Share Sponsorship Models in the United States*

Sponsorship Model	Description	Advantages	Disadvantages
Title Sponsor	This can be a single sponsor that pays for full branding of system infrastructure (e.g., London or New York) or multiple sponsors that split the cost in exchange for proportional branding (e.g., 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>	<p>Often difficult to secure sponsor given the large investment</p> <p>Less opportunity for smaller businesses to get involved</p> <p>Competing brands can conflict certain tenants or nearby businesses</p>
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>	<p>Significant effort required to secure and retain sponsors</p> <p>Not enough money to fully fund system, typically</p>
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>	<p>Income relies on “uptake” of a certain amount of sponsorship each year</p> <p>Significant effort required to secure and retain sponsors</p>
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>	<p>Significant effort required to secure and retain sponsors</p>

CitiBike in New York and Barclays in London are the only bike share systems able to procure enough sponsorship revenue (through title sponsor arrangements) to cover the up-front capital costs. These cities' size, density and media presence are not comparable to most US cities, including St. Louis. 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 Medical Mutual.) 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 combining 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.

It should also be noted that several communities are working with private contractors to try to fully finance bike share up-front capital costs through sponsorship and private-sector investment. DecoBike in Miami Beach is one example, and DecoBike is also working with San Diego on a similar approach. Tampa, Phoenix, and Atlanta are attempting this model, but none have procured enough funding to have launched as of this writing.

Table 20 outlines the variety of sponsorship agreements from some US bike share programs.

*Table 20: Sponsorship funding sources for US bike share programs*

<b>Program</b>	<b>Year Launched</b>	<b>Sponsorship Type</b>	<b>Sponsorship Agreement</b>
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

Citibike, New York	2013	Title Sponsor	\$45 million for five years from CitiBank and Master Card for exclusive sponsorship
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

## Revenue Summary

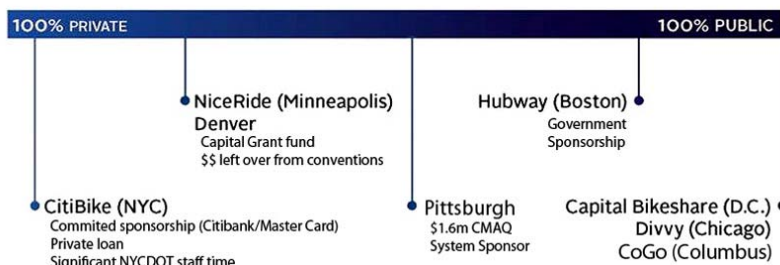
The reality for nearly all North American bike share systems is that a diverse and creative mix of revenue sources are needed to purchase and operate a bike share program. Many systems have relied on Federal grant funding through the Federal Transit Administration or via Congestion Mitigation and Air

Quality Improvement (CMAQ) grants to pay for a substantial portion of capital costs (e.g., 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. To pay for maintenance and operations, a standard mix of sponsorship dollars and user fees is 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 from sponsorship or advertising is 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 or public-sector investments to pay for operations. Revenue recovery in such cities is still significant however and ranges typically from 40% - 60%. Based on the modeling completed for this study, St. Louis is anticipated to fall into this category. The Preliminary Financial Plan in Section 12 articulates the financial gap necessary to fund both capital and operations for bike share in St. Louis.

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



## 12. 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 the St. Louis region. This chapter also presents a funding strategy for Phase I of the project.

### Cash Flow Analysis

Previous sections of this report presented expected system costs (Section 10), user-generated, sponsorship, and other revenues (Section 11) for the St. Louis regional bike share system. These are compared over the first five years of operations for a 60-station system that expands to 90 stations during the third full year of operations and remains that size through year 5.

*Table 24: Five Year Financial Forecast for LOW cost equipment (60 stations Year 1-2 and 90 stations in years 3-5. Note that annual inflation was not factored into the costs below)*

year	0	1	2	3	4	5
# of stations/hubs	60	60	60	90	90	90
# of bikes	540	540	540	810	810	810
# of docks/racks (1.9 per bike)	1026	1026	1026	1539	1539	1539
<b>COSTS</b>						
launch costs	\$864,000	\$0	\$0	\$432,000	\$0	\$0
capital costs (low)	\$1,800,000	\$0	\$0	\$900,000	\$0	\$0
admin. costs	\$30,000	\$0	\$0	\$15,000	\$0	\$0
operations costs	\$0	\$1,292,760	\$1,292,760	\$1,939,140	\$1,939,140	\$1,939,140
<b>Low Cost sub-total</b>	<b>\$2,694,000</b>	<b>\$1,292,760</b>	<b>\$1,292,760</b>	<b>\$3,286,140</b>	<b>\$1,939,140</b>	<b>\$1,939,140</b>
<b>Low Cost Cumulative</b>	<b>\$2,694,000</b>	<b>\$3,986,760</b>	<b>\$5,279,520</b>	<b>\$8,565,660</b>	<b>\$10,504,800</b>	<b>\$12,443,940</b>
<b>REVENUE PROJECTIONS</b>						
User-generated revenue	\$0	\$518,000	\$640,000	\$839,000	\$970,000	\$1,012,000
"Farebox Recovery" rate	na	40.1%	49.5%	43.3%	50.0%	52.2%
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>\$518,000</b>	<b>\$640,000</b>	<b>\$839,000</b>	<b>\$970,000</b>	<b>\$1,012,000</b>
<b>Revenue Cumulative</b>	<b>\$0</b>	<b>\$518,000</b>	<b>\$1,158,000</b>	<b>\$1,997,000</b>	<b>\$2,967,000</b>	<b>\$3,979,000</b>
<b>CASH FLOW</b>						
Annual shortfall	-\$2,694,000	-\$774,760	-\$652,760	-\$2,447,140	-\$969,140	-\$927,140
Cumulative shortfall	-\$2,694,000	-\$3,468,760	-\$4,121,520	-\$6,568,660	-\$7,537,800	-\$8,464,940



*Table 25: Five Year Financial Forecast for HIGH cost equipment (60 stations Year 1-2 and 90 stations in years 3-5. Note that annual inflation was not factored into the costs below)*

year	0	1	2	3	4	5
# of stations/hubs	60	60	60	90	90	90
# of bikes	540	540	540	810	810	810
# of docks/racks (1.9 per bike)	1026	1026	1026	1539	1539	1539
<b>COSTS</b>						
launch costs	\$864,000	\$0	\$0	\$432,000	\$0	\$0
capital costs (high)	\$3,300,000	\$0	\$0	\$1,650,000	\$0	\$0
admin. costs	\$30,000	\$0	\$0	\$15,000	\$0	\$0
operations costs	\$0	\$1,292,760	\$1,292,760	\$1,939,140	\$1,939,140	\$1,939,140
<b>High Cost sub-total</b>	<b>\$4,194,000</b>	<b>\$1,292,760</b>	<b>\$1,292,760</b>	<b>\$4,036,140</b>	<b>\$1,939,140</b>	<b>\$1,939,140</b>
<b>High Cost Cumulative</b>	<b>\$4,194,000</b>	<b>\$5,486,760</b>	<b>\$6,779,520</b>	<b>\$10,815,660</b>	<b>\$12,754,800</b>	<b>\$14,693,940</b>
<b>REVENUE PROJECTIONS</b>						
User-generated revenue	\$0	\$518,000	\$640,000	\$839,000	\$970,000	\$1,012,000
"Farebox Recovery" rate	na	40.1%	49.5%	43.3%	50.0%	52.2%
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>\$518,000</b>	<b>\$640,000</b>	<b>\$839,000</b>	<b>\$970,001</b>	<b>\$1,012,001</b>
<b>Revenue Cumulative</b>	<b>\$0</b>	<b>\$518,000</b>	<b>\$1,158,001</b>	<b>\$1,997,001</b>	<b>\$2,967,002</b>	<b>\$3,979,002</b>
<b>CASH FLOW</b>						
Annual shortfall	-\$4,194,000	-\$774,760	-\$652,760	-\$3,197,140	-\$969,139	-\$927,139
Cumulative shortfall	-\$4,194,000	-\$4,968,760	-\$5,621,519	-\$8,818,659	-\$9,787,798	-\$10,714,938

The purchase, launch and five-years of operations for Phase I and II—60 stations, increased to 90 stations—will require between \$12.4 - \$14.7 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 \$0.5 - 1.0 million per year, with a cumulative five-year projection of \$4.0 million. This leaves a funding gap of \$8.5 - \$10.7 million that will need to be filled with a likely mix of public and private dollars. The previous section outlines opportunities to raise capital and operations money through federal grants, private foundations, sponsorship and potential advertising revenues.

## 13. 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 them each month.

There are some aspects of the service levels that will be dependent on funding. Specifically, if system revenues support operations for the bike system, 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 month.

### Reporting

Data reporting and transparency is a key part of helping St. Louis 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 insurance types 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.

## 14. 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.

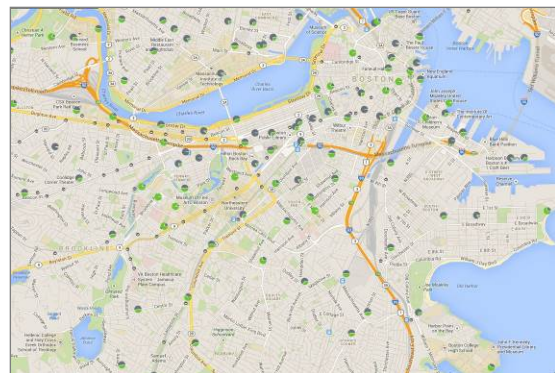
It is critically important for the early stages of planning and marketing a bike share program to include consideration of “system equity”. This is one of the key goals of the program in the St. Louis region. Related to system equity, there are three key areas in which strategies can be developed to 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. Though implementation of all of the best practices may prove impractical, the proposed bike share non-profit should try to incorporate many of these strategies, programs and funding concepts to promote a more equitable system.

### 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.

#### 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



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

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**

When the Nice Ride Minnesota system launched in 2010, 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, eight 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 new stations comprised a very small percentage of all Nice Ride trips (2.2%). Of those trips, North Minneapolis residents took 22%, a geographic 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 might 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.



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

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



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

### **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 \$2,000 each), 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. Residents meeting any of the requirements below 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 qualified low-income residents. Of the 200 memberships offered in the first cycle, 20 residents took advantage of the free memberships.



*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.*

### 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 for the spring 2015 system launch (<http://planphilly.com/articles/2014/04/25/bike-share-behind-schedule-but-will-be-accessible-without-credit-card>).

## 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 was 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 Bikeshare 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.



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

## Summary

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



## 15. Implementation Plan

This section outlines a possible implementation plan for establishing a bike sharing program in the St. Louis region. It includes identifying the roles and responsibilities of key participants, next steps, a broad timeline, and a summary of potential risks to maintaining that timeline.

The first step will be to have the Great Rivers Greenway Board, the City of St. Louis and St. Louis County adopt and/or endorse the St. Louis Bike Share Study. The robust public engagement aspect of this study has ‘taken the temperature’ of key stakeholders—public agencies, local institutions, the downtown business community and advocacy groups—and shows support for bike sharing throughout the region. Gaining support from the Board of Alderman and the County Council will ensure success.

Once political support from key public entities is officially established, in an ideal world, a high level elected official or a prominent member of the business community or an institution will need to become the bike share project “champion”. The champion may be an individual or small group who can influence others by using their connections and contacts to help raise money and convince others to formally show support. The project champion will ideally remain in that position until the program is formally launched, and through the initial year of operation.

The bike share champion should then work with Great Rivers Greenway and others to make a formal decision on the business model. As recommended in this report, it is anticipated that a non-profit will be established and oversee St. Louis bike share. Initial steps to be taken by the project champion and potentially other members of the new non-profit Board include:

- file the necessary paperwork to be recognized as a non-profit by the State of Missouri and the Internal Revenue Service
- write grant applications to some of the various sources described earlier in this report
- research other cities’ equipment and/or operations Requests for Proposals (RFPs) to prepare for the drafting of an RFP for the proposed system in St. Louis
- reach out to potential sponsors in the business, institutional and foundation world

Sponsorship can take time to find. Based on the experience from other cities, it has taken from 6 months to several years for fundraising. The chances of finding private sponsors (and meeting a reasonable timeline) are greatly enhanced: (a) if the mayor or other high-profile community leaders assist or support the process; and (b) if there is some level of financial commitment or “match” from the City of St. Louis, St. Louis County, Bi-State Development Agency (Metro), etc. to show that they have a stake in the system and are looking for a “partnership” rather than relying exclusively on the private or institutional sector for funding.

At this stage, only a general timeline can be given without knowing the commitment of potential Board members of the new non-profit and any sponsors. After the completion of this study, key milestones with estimated time frames could include:



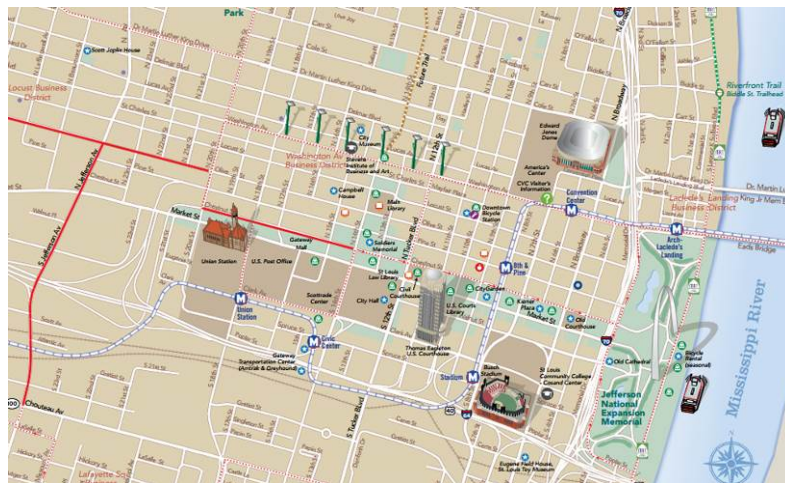
- Great Rivers Greenway District to convene the founding Board of Directors for the new non-profit and prepare presentations to Board of Alderman, County Council and others: 2-4 months.
- Site planning, public engagement and permitting for the 60 stations: 6 – 12 months (this does not include the potentially lengthy permitting process with the National Park Service for stations on Federal land adjacent to the Gateway Arch)
- Issue RFP for equipment or equipment & operations and evaluate responses: 3 - 4 months.
- Contract negotiations with equipment provider and/or operator: 2 - 4 months.
- Fundraising: 8 - 12 months.
- Procurement, delivery, assembly and deployment of equipment: 6 months.
- Total timeline to launch: 18 – 30 months.

There are a handful of items that threaten to disrupt the rough timeline for implementation stated above. This includes:

- **Funding:** funding delays in other systems have come from the timeliness of securing and accessing federal grant funding (typically the less federal grant money used for a system, the quicker the road to implementation); and the time required to find and secure private sponsors (this is greatly enhanced by bringing some level of public funding to the table, if possible).
- **Contract Procurement Negotiations and Signing:** drafting a contract with an equipment vendor and/or operator will require numerous legal and bureaucratic steps.
- **Naming and Branding:** it can take a lot of time to name the system, determine a color scheme, and agree to a logo. These elements affect equipment manufacture, the production of maps, launch of website, etc.
- **Installation and Launch:** there are a number of unknowns that can arise during the planning, installation and launch periods ranging from equipment delays to staff availability to permitting delays. The latter can be expedited by the relevant permitting agencies defining a streamlined permitting process (e.g. to issue a blanket permit with station siting guidelines that require the operator only to prepare a drawing for review and confirmation).

## Bikeway Infrastructure Improvements

Concurrent with all of the items above, it is critical for the City of St. Louis, Great Rivers Greenway District and relevant municipalities within St. Louis County to continue bikeway infrastructure improvements. Of the more than 1,200 people who filled out the bike share usage survey throughout the summer, 51% considered the lack of bikeway infrastructure to be a barrier to use. Nearly two-thirds said



*The current bicycle map of downtown St. Louis contains few dedicated bicycle facilities ([www.greatriversgreenway.org](http://www.greatriversgreenway.org))*

that additional bikeway infrastructure would be a motivator to use bike share more frequently (see Appendix 2).

The bikeway infrastructure is especially important in areas of St. Louis such as Downtown and the Central West End that will host the highest density of bike share stations. Downtown St. Louis, specifically, will see visitors and tourists as a high percentage of bike share users. People new to the city are likely to be the most sensitive to the lack of dedicated bikeway facilities and may dismiss bike share as an option if the expectation is to share the busy streets with motor vehicle traffic. At a minimum, it is critical for protected bike lanes or barrier-protected facilities be added to the network to connect some of the key visitor destinations downtown such as the Gateway Arch, Citygarden, Busch Stadium, the Scottrade Center and the City Museum.

The coordination of bikeway infrastructure development and bike share implementation occurred in many cities with successful bike share programs. Some cities such as New York or Chicago wanted a core network of bike lanes and protected cycle tracks in place before the launch of their massive, and very popular, systems. Cities such as Washington, DC, Boston and Columbus OH, began an aggressive program of striping bike lanes, improving trails and building protected bikeways concurrent with the launch of bike share. It is recommended that St. Louis do as Washington, DC, Boston and Columbus have done and complete Bike St. Louis Phase 3, and continue to expand the system with low-stress bikeways in 2015 or 2016. This will allow additional bike facilities on-the-ground, and on-going, prior to launch of bike share. Although bike share has proven to be exceptionally safe in nearly all cities in which it has launched, the new bikeways will send a signal to potential users that the streets of Downtown St. Louis and St. Louis County are comfortable and safe for bicycling. For someone visiting the city for a weekend, or the MetroLink commuter from Illinois looking for an easy way to do errands or get some exercise, improvements in bikeway infrastructure will shift the decision towards bike share use. The folks most sensitive to the perceived conditions for bicycling also form a core of the “casual user” base of the system; those who purchase a 24 or 72-hour pass and provide significant revenue for operations.



*A bike share station adjacent to a protected bike lane, or cycle track, in New York City*

## **Bike Share Stations on National Park Service Property**

A critical location for future bike share stations in St. Louis is within close proximity to the Gateway Arch. With its four million visitors a year, the Arch will generate significant demand for bike share use, as a way to connect to Downtown’s many hotels, restaurants and visitor attractions. While site planning strategies need to keep in mind critical view corridors, visibility and access from the Arch will improve the likelihood of success for the station (or stations) that serve the Arch. As such, discussions with the

National Park Service (NPS) and CityArchRiver will need to commence relatively quickly to ensure a smooth and timely permitting process.

It is important to note that there is precedent for placing bike share stations on NPS property, most notably along the National Mall in Washington, DC as part of the Capital Bikeshare (CaBi) system.<sup>10</sup> Also, the Nice Ride system in Minneapolis and St Paul worked closely with the NPS to place stations near the Mississippi River National Recreation Area (NRA). The stations are located on City property and have been permitted by the two cities, but the funding and program support is provided by the NPS. Finally, Arlington County, VA has recently received funding to install CaBi stations adjacent to the Mount Vernon Trail, which is owned and operated by the NPS, through the Federal Lands Access Program. Similar to the Nice Ride program, the stations are being planned for non-NPS property but in close consultation with the federal agency.



*Capital Bikeshare station sitting adjacent to the Lincoln Memorial along the National Mall*

## Develop Request for Proposals for Equipment or Equipment and Operations

A critical step in the process before launch is the procurement of bike share equipment: the bicycles, the docking stations (or simple bike racks for “smart lock” systems), the kiosks, the solar panels and necessary software, both front-end software within the transaction kiosk and the back-end software that allows the system to function. In most instances throughout North America, cities or regional agencies have used a Request for Proposal (RFP) process for equipment procurement. This will likely be a necessary step in St. Louis due to bidding requirements related to the use of federal grant money, assuming the program will rely on this key source of funding. Going through an RFP process also allows St. Louis’s recommended bike share non-profit to evaluate various equipment options and select one that provides the highest quality and/or the best value for the available funds. In most instances, bike share RFP processes include an equipment testing phase where vendors bring models of their product

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<sup>10</sup> Following the initial launch of CaBi in Washington, stations were not permitted on NPS property due to an interpretation of an existing sole-source vendor contract that covered a wide range of services, including transportation. The contract was successfully challenged by parties not associated with Capital Bikeshare and was deemed invalid. Following this action the District Department of Transportation (DDOT) and CaBi staff worked closely and cooperatively with the NPS to plan and install five CaBi stations on NPS property in the Monumental core of the city. Station locations that minimized the visual impact on monuments were selected and Special Use Permit application was submitted by the City to the NPS. The application included a \$2500 performance bond tied to the installation of the stations, some of which required pouring of concrete pads. CaBi also received a Categorical Exclusion under the requirements of the National Environmental Policy Act (NEPA). Additionally, a separate permit was obtained from the United States Park Police allowing access for CaBi’s rebalancing and service vehicles on roads where commercial vehicles are generally prohibited.

to St. Louis for members of the non-profit's selection committee to fully understand how the system works and to take a test ride on one of the bikes.

Depending on whether the future bike share non-profit decides to operate the system by itself or hire a private vendor for operations, the RFP can be for equipment alone, or it can seek a team comprised of a professional operations company and an equipment provider. Another option is to have two separate RFPs for equipment and operations, but that is rare within existing bike share systems. There are a number of well-written RFPs that other cities have put out to bid over the years, including Boston, New York, Philadelphia, Chicago, Phoenix, Seattle and a handful of others. The St. Louis bike share non-profit should look to these as potential templates.

There are a number of standard requirements that are common to all bike share RFPs, eg: sturdy bicycles, all-weather braking, built-in lights that don't require batteries, adjustable seat, etc. However, there are a number of desired features for the equipment in St. Louis which is consistent with best practices and was made clear within the public engagement for this study. TAC and CBAC members and open house attendees indicated that the elements that should be required, or at least expressed as highly desirable in the equipment RFP include:

- Capability for a unified bike share member pass, key or fob with transit (requires close coordination with B-State Development Agency, or Metro)
- Built-in Global Positioning System (GPS) within the bicycles, for easy tracking and data collection
- For dock-based station systems, a secondary lock on the bicycles for quick errands to areas where a station may not be present
- Required front basket with rear basket desired
- Capability to include bicycle safety information on the bike and within clear view of the rider
- For systems in which transaction kiosks are optional, they are expected at most stations, especially those expected to have significant use by visitors to St. Louis
- Helmet vending machines should be required as an option at key stations with the highest expected use, especially by non-annual members
- Other special features can be determined by the future non-profit in preparation for the RFP.



## 16. Bike Share Study Summary

This Study outlines the background, existing context assessment, system planning, cost and revenue analysis, the business planning and implementation strategy for the creation of a bike share program in the St. Louis region. It also 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.

Numerous cities in the United States recognize the health, environmental, and economic benefits of bike sharing. The City of St. Louis and St. Louis County have many of the characteristics required to make bike sharing successful and have an opportunity to continue its development as a bike-friendly region. To improve the opportunity for success, the City and County will need to continue, or accelerate the creation of bikeway infrastructure. This is especially true in Downtown St. Louis where visitors and tourists will need to feel more comfortable and safe before hopping on bike share to access the many great destinations the city has to offer.



*In 2016 or 17, St. Louis may have a bike share program in place*

The robust public engagement program during the feasibility study resulted in roughly 1,500 residents participating in the planning process. Overall, most people are supportive and excited about the prospect of having a bike sharing system in St. Louis. As the Study moves to implementation, building awareness and interest will be critical to a successful launch. Additionally, to encourage riding confidence and ultimately, bike share usage, it is imperative to improve St. Louis' bikeway infrastructure and provide better education about bikeway types among cyclists, motorists and pedestrians.

The system will consist of an initial launch (Phase I) of 60 stations and 540 bikes spread across Downtown St. Louis, Midtown/Grand Center, the Central West End, Forest Park and a handful of stations in the Grove District, the Delmar Loop and the southern limits of North City. Phase II will comprise of 30 additional stations with 270 more bikes in Downtown Clayton and neighborhoods in North and South City adjacent to the Phase I launch area. Ownership of the system will likely come from a non-profit consisting of various regional agencies, corporate sponsors and community leaders. Operations and maintenance of the system could be supplied by either the non-profit organization or a private vendor.



Station sites will ultimately include a mixture of sidewalk, on-street, and public space / plaza 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. In lower demand areas at the service zone edges and within Forest Park, some stations will be up to ½ mile apart.

#### Five-year Pro Forma for St. Louis Bike Share

	Low (\$30k/station)	High (\$55k/station)
PHASE 1 - Capital	\$1.8 million	\$3.3 million
Launch	\$0.9 million	
Operations	\$6.5 million	
Sub-Total	\$9.2 million	\$10.7 million
PHASE 2 - Capital	\$0.9 million	\$1.7 million
Launch	\$0.4 million	
Operations	\$1.9 million	
Sub-Total	\$3.2 million	\$4.0 million
Phase 1 & 2 TOTAL	\$12.4 million	\$14.7 million
User Revenues (5 years)	\$4.0 million	
5 year shortfall (i.e. sponsorship, grants and other funds needed)	\$8.4 million	\$10.7 million

Phase I and II of the system is expected to cost from \$12.4 - \$14.7 million over five years—depending on selected equipment and technology—including capital, launch, administration, and operating costs. Projected revenue of \$0.5 million (year 1) to \$1.0 million (year 5) dollars per year will provide 40%-52% of the operating fees, but will need to be defrayed by \$8.5 – 10.7 million in gap funding over the five-year period. Many cities face a similar situation and strategically seek funding from a variety of sources such as advertising revenue, corporate grants and sponsorships, and public funds.

Members will be able to access the system for a cost of roughly \$75 for an annual membership, \$25 for a monthly membership, \$15 for a three-day pass, and \$7 for a 24-hour pass (prices may change prior to or just after launch). 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. Ideally, members will be able to purchase a combined transit and bike share pass to further enhance multi-modal opportunities in the St. Louis region.

Given the importance of providing bike share for a diverse range of neighborhoods and demographic groups in the region, it is recommended that the program incorporate some of the Equity best practices from Section 14. The station planning, affordability strategies, and promotional programs may not bring high levels of use in all neighborhoods within the overall service area, but will create another mobility option for communities in need of transportation to jobs, shopping areas and destinations.

From inception to launch, a 60 station, 540 bike system will take approximately 18-30 months to implement. Specific “next steps” that will need to be met before a potential 2016 or 2017 launch includes:

- Establish a program “champion”; an individual or small group with strong political and corporate connections, and who is dedicated to building bike share in St. Louis;



*A bike share program can provide added mobility for communities throughout the St. Louis region*

- 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;
- Continue to aggressively implement Bike St. Louis Phase 3 and other bikeway projects within the designated service area to promote access and safety for less-experienced riders;
- Secure system plan approval and permitting from the City of St. Louis, National Park Service and others;
- 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
- Launch event/celebration

In the next two to three years, St. Louis will place itself within a growing group of US cities that have made their cities a better place to live, visit and explore through bike share. Many medium-sized cities have implemented or are planning to implement bike share in the near future after seeing the success in cities as diverse as Denver, Minneapolis, and Columbus. In all cases, success has been modest to extraordinary and there is optimism that St. Louis can achieve the level of accomplishment seen in many other cities throughout North America.