



Atlanta-Decatur Bike Share Feasibility Study



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Acknowledgements

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Dear Friends:

When I first heard of “3rd generation” bike share programs, with highly visible, automated kiosks powered by solar energy providing bicycles for short trips in cities around the world, I was immediately intrigued. But at the time, back in 2007, most people didn’t think Atlanta was ready for bike share.

We’d seen, in Decatur, a short-lived program called Yellow Bikes that was associated with the concept and generally considered less than successful as a bike share program (though as a bike distribution program, it clearly served its purpose). We had few and disconnected bike lanes, paltry bike commuting numbers, and a widespread belief that we were too much of a car-dominated city and region for biking to ever really take off.

Today, five years later, I’m pleased to say that is changing. City planners and elected officials are acknowledging both the needs of existing cyclists - our numbers grew dramatically over the last decade - and the desirability of attracting more people to cycling. The BeltLine is transforming the way people think about getting around, making cycling convenient, safe, and attractive to area residents and visitors. Businesses are seeing the value bicycle infrastructure adds to their bottom line and community relationships. And citizens are taking to the bike in ever-growing numbers.

The City of Atlanta opened not one, but two bicycle projects in October 2012 - a small scale but large impact bike lane connection in Midtown, and the BeltLine Eastside Trail, which opened to immediate popularity and much fanfare. Atlanta is home to two Bicycle Friendly Universities (Georgia Institute of Technology and Emory University), and the City of Decatur was named a bronze-level Bicycle Friendly Community by the League of American Bicyclists. From the presence of a bike share start up on the campus of Georgia Tech and early inroads into bike sharing on the Emory campus, to the location of an international bike share company US headquarters in Atlanta, to the phone calls and emails we get from local entrepreneurs wanting to invest, all signs indicate strong interest in bike share.


For all of these reasons and more, I think we’re ready for bike share now.

This report, funded by a grant from the Atlanta Falcons Youth Foundation, illustrates the how, when, why, and where of the prospects for bike sharing programs in the cities of Atlanta and Decatur. It will be presented to city and community leaders, cyclists, businesses, and the public to raise awareness of what bike sharing could mean for the city.

Paired with robust investments in much-needed bicycle infrastructure, bike sharing will help the city achieve goals in the arenas of sustainability, economic development and tourism, active transportation mode share, and talent retention.

It will increase demand for bike facilities, especially the newer designs that provide greater separation from traffic such as cycle tracks, spurring huge increases in biking for transportation in other U.S. cities after decades of success in Europe.

At this point it’s not a question of if, but when, the Atlanta region will invest in this dynamic concept. Cities around the world, and increasingly, the United States, are not waiting for us.



Rebecca Serna

Executive Director, Atlanta Bicycle Coalition

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Executive Summary

Is bike sharing feasible in Atlanta and Decatur?

Bike share is a proven technology and form of public transit that is successful in cities around the US and the world. Cities are looking for innovative transportation solutions that meet the needs of a 21st century economy, and bike share is one of these solutions.

Mobility, affordability, community health, environmental impacts, convenience and safety are all elements by which today's transportation systems are measured. Bike share addresses all of these by providing a cost-effective, convenient and healthy mode of transportation.

The goal of this study was to use best practices and experiences from peer cities to examine how and where a bike share system could operate in the cities of Atlanta and Decatur.

Questions that were addressed as part of this study include:

- What are the existing conditions and context for cycling in Atlanta and Decatur?
- Where in Atlanta and Decatur would a bike share system be most successful given the demographics, development patterns and existing infrastructure?
- What is a feasible size and service area for a bike sharing system in Atlanta and Decatur?
- How can bike sharing be funded and operated in Atlanta and Decatur?
- What policies or regulations need to be changed or adopted to support bike sharing?

Performance Summary

From the community suitability analysis conducted for this study, three service areas are identified for phase 1 implementation. These three areas include Buckhead, Downtown Decatur and the Atlanta Core, which includes Midtown, Downtown, West End and the adjacent neighborhoods.

Combined, these three service areas cover 14.1 square miles, or 15% of the area of Atlanta and Decatur. 1 in 4 residents 18-64 years old of Atlanta and Decatur live within these service areas and 1 in 2 employees work there. These numbers show that the proposed phase 1 service area would provide access to a bike share system to approximately 25% of residents age 18-64 and 50% of workers.

Additionally, these numbers do not include the people who live or work outside these areas but still visit for work, leisure or other activities. Combine these potential users with the millions of visitors and tourists who visit Atlanta and Decatur every year, and bike share could easily meet the transportation needs of a wide range of people.

The suitability and demand analysis estimates these three service areas can support 570 bikes and 57 stations. These system metrics would make Atlanta and Decatur's system equal, in terms of system density, to systems in the Washington D.C. region and Minneapolis-St. Paul, which have two of the largest and most successful systems in the U.S.

3

proposed Phase 1 Service Areas

1 in 4

residents 18-64 in Atlanta and Decatur live within the Phase 1 Service Areas

57

proposed number of stations

1 in 2

employees in Atlanta and Decatur work within the Phase 1 Service Areas

\$6.0 - \$12.9

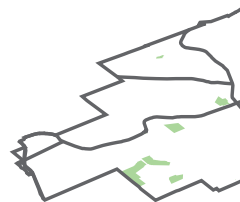
estimated cost, in millions, for the proposed system size over six years.

570

proposed number of bikes

14.1

area, in square miles, of Phase 1 Service Areas



It is worth noting that the proposed system for Atlanta and Decatur has a smaller geographic coverage area than peer city systems in the Washington D.C. region and Minneapolis-St. Paul. This condition is largely the result of development patterns and population and destination density. Compared to other cities with successful bike share at the scale being proposed, Atlanta and Decatur have lower population and destination densities.

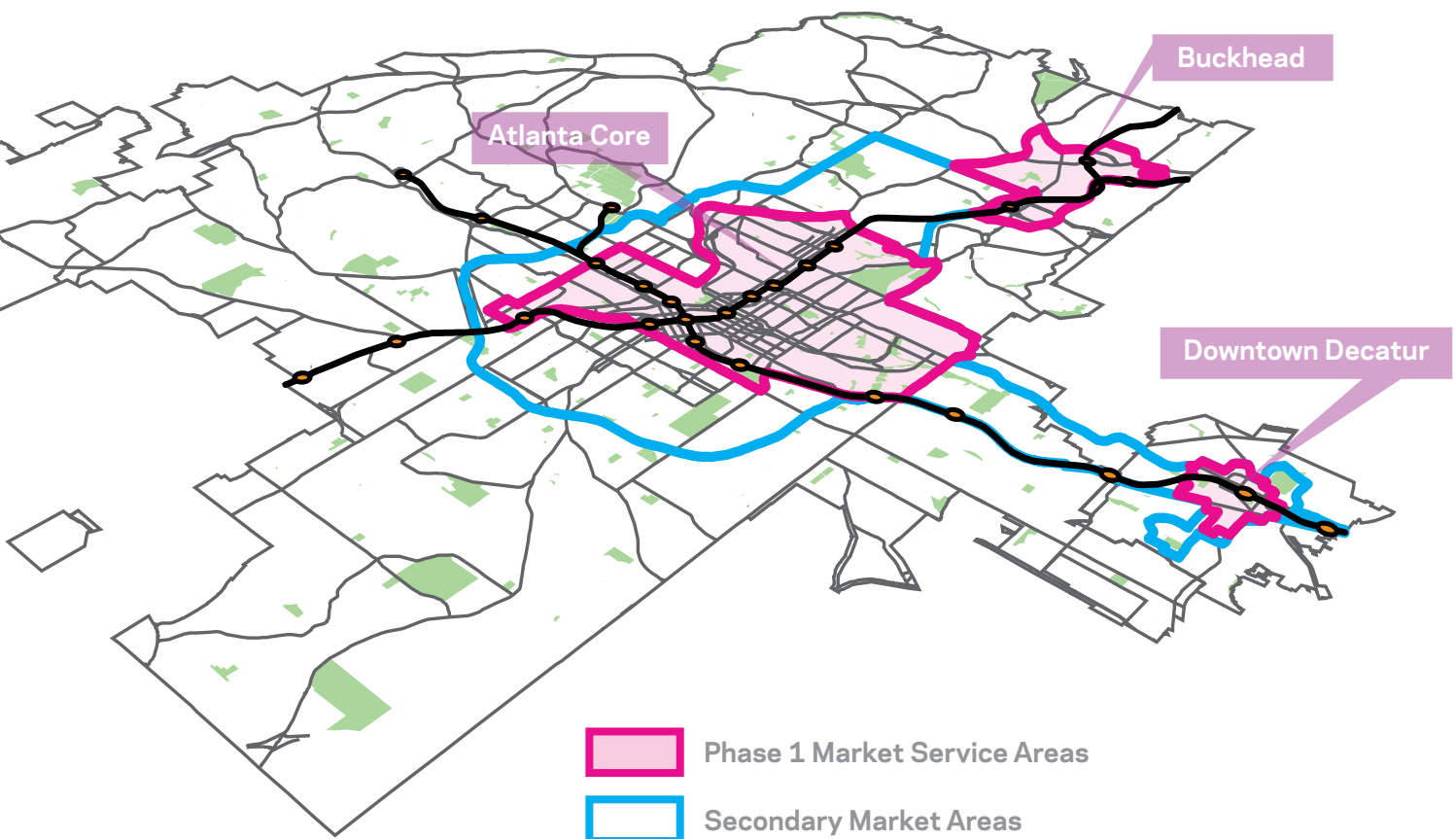
This being said, Atlanta and Decatur have adopted policies and have proposed projects that support the community design and density that makes bike share successful. That is why the Secondary Market Areas are identified. These areas, such as the areas along the Atlanta BeltLine's southern and western sections, are envisioned to have walkable, mixed use development served by existing and future transit. This type of environment is ideal for bike share and bike share system expansion and growth can occur in tandem with these areas as they redevelop.

A financial analysis of the proposed system metrics was also completed to develop initial cost estimates. The question asked was, 'How much would a system of this size cost to build and operate?' Additionally, the analysis was calculated with two bike share models. One model was a fixed station system, similar to Capital Bikeshare in the Washington D.C. region. The other model was a flexible station model, similar to viaCycle at Georgia Tech.

The analysis estimates that capital and operational costs for the proposed system size ranges from \$6.0 to \$12.9 million over a six-year period. For comparison, these figures are approximately equal to double the cost of one bus route over six years, which costs approximately \$6.1 million.

To finance a system of this size, capital and investment revenue will need to be secured. User-generated fees are not enough to cover the full cost of the system. Grants, sponsorship and other investment strategies can help fill this gap.

Addressing these requirements and other components of bike share are discussed in greater detail throughout the rest of the report. Other cities have proven that bike share is feasible and this study shows it can work in Atlanta and Decatur. It is up to the community to decide if bike share is right for Atlanta and Decatur and, if so, how to make it a reality.



Bike share is...

Bike sharing is as dynamic as the city it serves. With stations and bikes distributed around the city, users can conveniently access where they want to go when they want to go.



...a transit option.

Bike share is two-wheeled public transportation. It also compliments traditional public transportation service. Bike share helps transit riders cover what is often referred to as the "first and last mile" of a transit trip. Rather than walking the last several blocks to or from a transit station or bus stop, bike share users can cover the equivalent distance in half the time it takes to walk, a convenience that reduces travel time for transit riders.



...innovative technology.

The Internet and mobile technology make bike share possible. Bikes, stations and the web technology that makes bike share work provide users with convenient and real time access to the system. The technology also allows users, operators and owners access to real time information and performance data about the system.

...bike parking infrastructure.

A bike share system gives people the convenience of not having to own a bike or have a place to lock it up at the beginning or end of a trip. Those needs are built in to the system.



...a catalyst.

Cities that have implemented bike share can attest to its transformative effect. Suddenly, everyone is a potential cyclist in the city. It changes people's perspectives about cycling and how they get to destinations. It also creates demand for better cycling conditions and infrastructure.



...a source of green jobs.

Bikes use people power, rather than greenhouse gas emitting fuel, to operate. Plus, they get people active while getting from point A to point B. Combine this with the fact that bike share systems need people to operate and maintain the system, such as bicycle mechanics, and you have a transportation system that offers green job opportunities for the community.



...a positive city image.

The image of a 21st century city is one that is active, vibrant, accessible and social. Bike share supports these goals by providing a healthy and convenient transportation option.



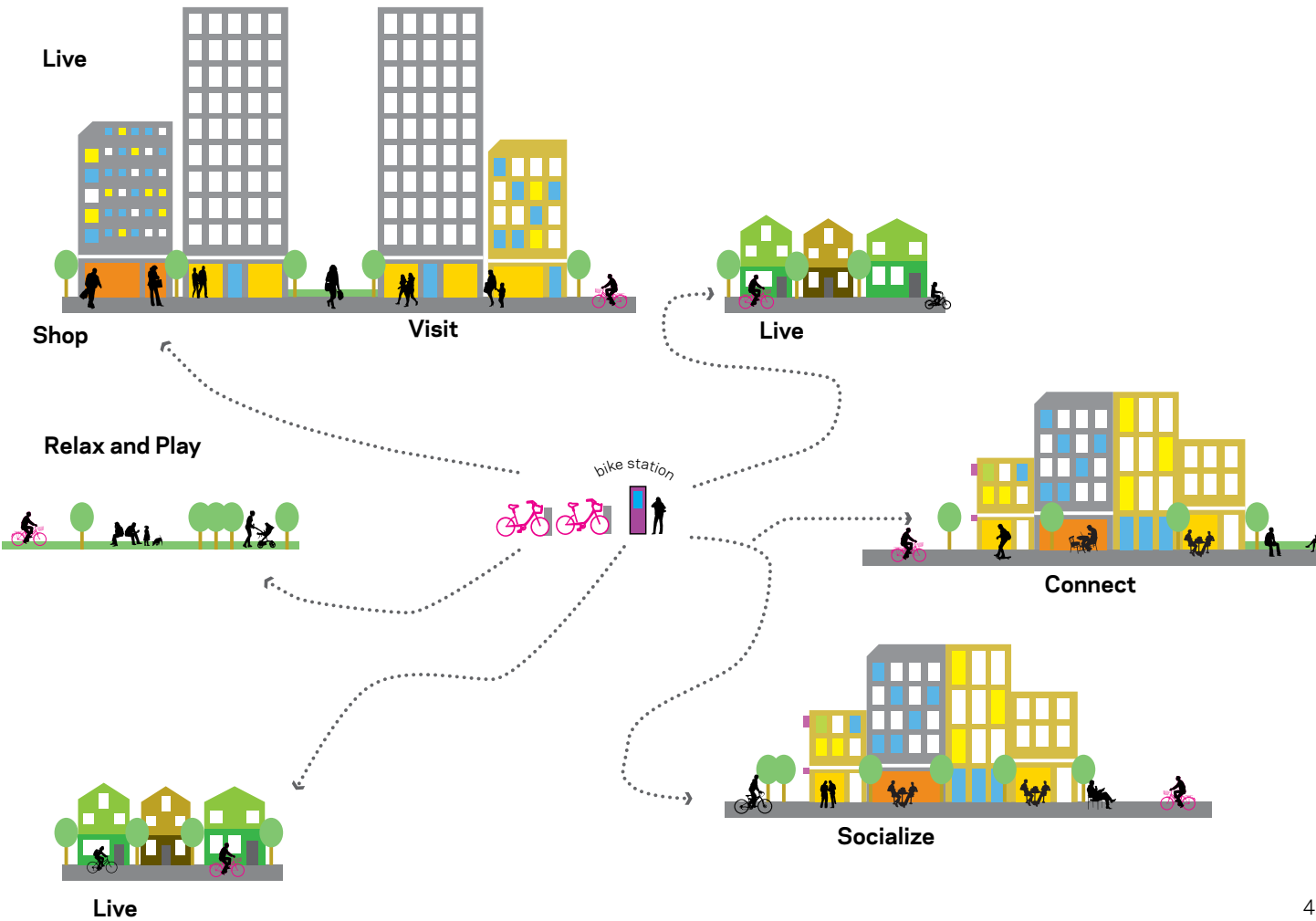
...a connector.

Bike share is a flexible form of public transportation. Rather than have to wait for a train or bus that follows a fixed route, bike share users can customize their route and destination based on where they want to go.

...affordable.

For the cost of one to two tanks of gas or one monthly MARTA pass, someone can have a yearly membership to bike share. Plus, daily passes for visitors or tourists are comparable to MARTA daily passes. Bike share can be a cost-effective alternative to renting a car, taking a taxi or having to pay to park.

Work



Proposed System Metrics

To provide more detail about the proposed bike share service for the cities of Atlanta and Decatur, the three tables on this page have been included. The table at right provides information about a bike share service that covers both cities. The tables below include information for the phase 1 service areas unique to each city. The tables include information describing the proposed system performance metrics, demographics and estimated costs. Additionally, the map on the following page shows the three service areas proposed for phase 1 implementation.

Atlanta and Decatur by the Numbers

Phase 1 Service Areas - Buckhead+Atlanta Core + Downtown Decatur

Service Area Population 18-64	88,958
% of Atlanta and Decatur Residents 18-64	28.8%
Service Area Employees	223,855
% of Atlanta and Decatur Employees	46.9%
Service Area	14.1 sq ml
Bikes	570
Stations	57
Station Density	4 per sq ml

Estimated Costs Over Six Years

Estimated Capital Costs	\$1.7 - \$3.7 million
Estimated Operations Costs	\$4.3 - \$9.2 million
Total Estimated Costs	\$6.0 - \$12.9

Atlanta by the Numbers

Phase 1 Service Areas - Atlanta Service Areas (Buckhead+Atlanta Core)

Service Area Population 18-64	86,831
Service Area Employees	222,022
Service Area	13.5 sq ml
Bikes	540
Stations	54
Station Density	4 per sq ml

Estimated Costs Over Six Years

Estimated Capital Costs	\$1.6 - \$3.5 million
Estimated Operations Costs	\$4.1 - \$8.7 million
Total Estimated Costs	\$5.7 - \$12.3 million

Decatur by the Numbers

Phase 1 Service Areas - Downtown Decatur Service Area

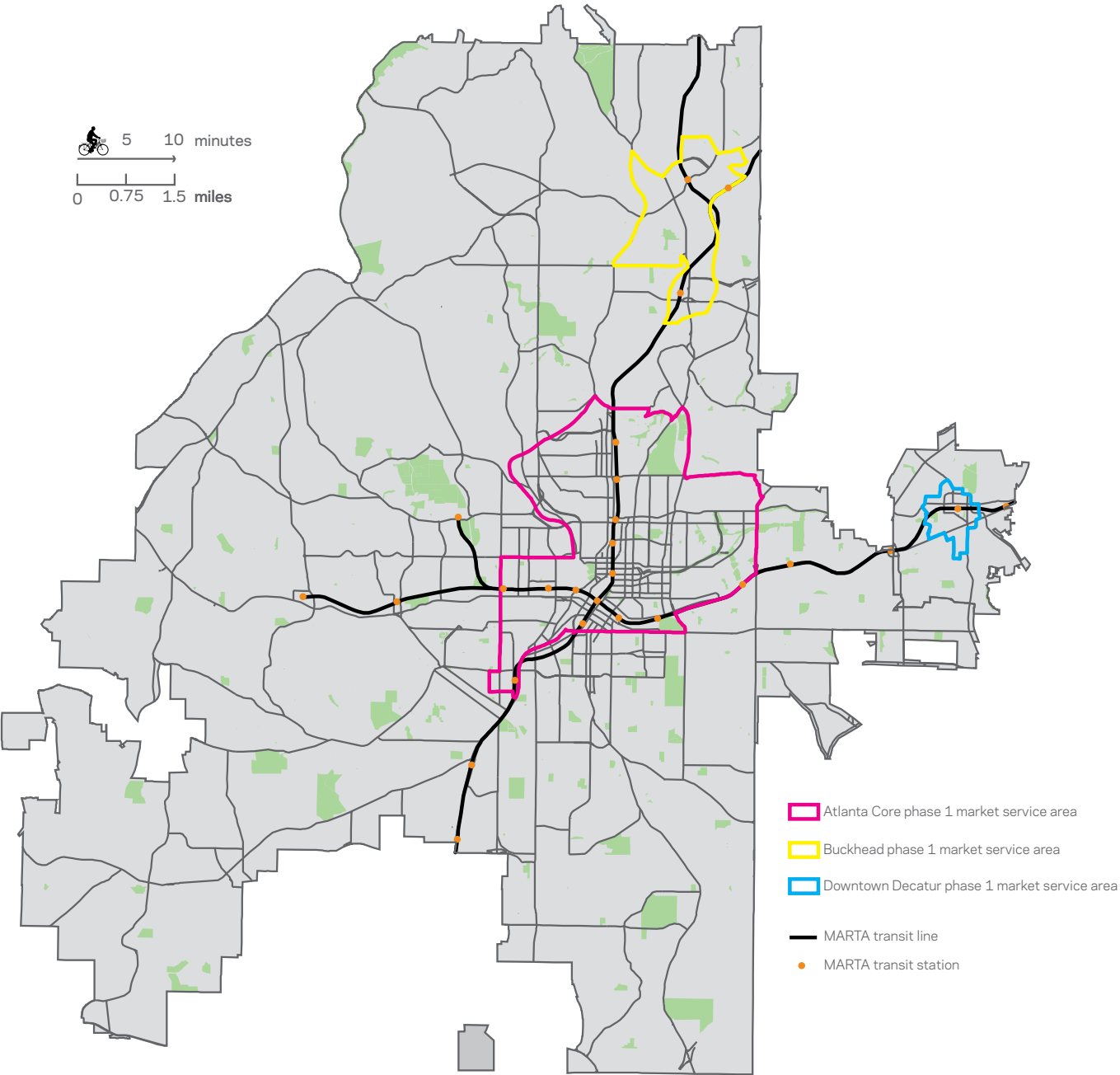
Service Area Population 18-64	2,127
Service Area Employees	1,833
Service Area	0.6 sq ml
Bikes	30
Stations	3
Station Density	4 per sq ml

Estimated Costs Over Six Years

Estimated Capital Costs	\$100k - \$200k
Estimated Operations Costs	\$200k - \$500k
Total Estimated Costs	\$300k - \$600k



Proposed Phase 1 Service Areas



What are the next steps?

This study provides a menu of options for Atlanta and Decatur to consider and should serve as a guidebook for future decision-making about bike sharing. Each bike share system in operation is unique and has been adapted to meet local transportation goals, community needs and local governance standards.

Moving forward, Atlanta and Decatur should use this study as a starting point to define the type of system desired for the community. There are many decisions and questions that need to be explored further or in more detail before each city implements a bike share system. Some of these questions include:

- What are the community goals for bike sharing?
- What type of bike share business model is appropriate for each city?
- Who should own and operate a bike share system?
- How and where should bikes and stations be located?
- What, if any, infrastructure improvements are needed?

Answers to these questions and others should be developed through community conversations and a competitive bidding process with interested bike share vendors. At the end of the day, this study is meant to inform, educate and start a community dialogue about bike sharing and the future of transportation in Atlanta and Decatur.

To help guide next steps in the conversation, the diagram below summarizes the phases of planning, implementation and performance assessment that are recommended for a bike share system. This study represents step one of many just in the planning stage. The community will have to decide what the actual next steps are. Whatever direction the conversation goes, the process should be open, transparent and tied to planning precedents in Atlanta and Decatur.



Bike Share Technology Comparison

The two types of bike share technologies analyzed as part of this study are a fixed station system and a flexible station system. The differences between the two types of systems are associated with their technology.

Fixed Station Summary

A fixed station system has stations with a variable number of docks and a kiosk at each station location. The locking mechanisms are designed so that a bike needs to be locked to a dock in order to be returned to the system for someone else to use. The kiosks allow members and casual users to access the system, make payments and do other functions.

Other key features include:

- Stations provide predictable locations for users to locate bikes, checkout and return bikes, and sign-up for the service.
- Stations require some construction work to install.
- Anyone with a credit card can sign up to use the service at a station without the use of personal mobile technology, such as a cell phone or smartphone.
- Bikes must be returned and docked at stations to be returned to the system for others to use.

Flexible Station Summary

A flexible station system integrates most of the enabling technology into the bike. The locking mechanism is integrated into the bike so they can use standard bike racks rather than more expensive docks. Access to the system is managed exclusively with mobile technology, such as a cellphone or smartphone, rather than a kiosk.

Other key features include:

- Bicycles can be returned anywhere within specified drop-off areas, which offers a greater diversity of areas to return bicycles.
- The system requires no construction work for stations, other than the installation of standard bicycle racks.
- Anyone with a mobile device, such as a cellphone or smartphone, can use the service.

Major Differences and Trade-offs

The two main differences between the technologies is how users access the system and signage. These differences impact how the systems are installed and how customers interact with the service.

In terms of access, fixed station systems with kiosks allow anyone living or visiting an area with bike share to walk up to a station and sign-up to use the system at that moment. This is an important feature because it supports the spontaneity of bike share. Additionally, it increases the convenience of signing up for casual users, which are often a significant revenue source for bike share systems.

By comparison, the flexible station model analyzed depends exclusively on customers' mobile technology to access the system. Additionally, the model requires users to sign-up online and establish an account before using the system. The requirement adds an extra step before customers can begin using the service.

Another component of access is the physical location of bicycles. Fixed stations, by design, require bikes to be checked-out and returned at specific points and locked to a dock. This design feature reduces the flexibility of where bikes can be accessed or returned, but it also increases the predictability of where bikes are located. This predictability can improve the convenience of locating bikes for customers and operators.

With flexible stations, locating and returning bikes offers greater flexibility for users. Without the requirement to return a bike to a dock, flexible station bikes can be locked to any street furniture within the designated drop-off zone. While this can be convenient at the end of a trip for customers, it also carries the potential that bikes are scattered. This scattering can complicate retrieval of bikes for customers and operators.

The signage considerations are related to user information, visibility and advertising capacity. With a fixed station system, components of the station include a kiosk and map frame. These features create space for important user information, such as a system map and safety information. These features also increase visibility for users to identify stations while riding or to attract casual users, such as tourists. In terms of advertising, the added surface area provided by kiosks and map frames provides additional space for advertising revenue. For the purpose of this study, the cost of map frames were included for both systems.

It is important to note that flexible stations can incorporate some of the access and signage features of fixed stations in order to improve visibility and access. However, these accommodations will likely increase costs associated with a flexible system and the stations will begin functioning more like fixed station systems than purely flexible station systems.

Cost Comparison

These technology differences are reflected in the estimated costs developed as part of this report. The estimated cost for a flexible station system is \$6 million dollars and \$12.9 million dollars for a fixed station system. These figures include estimated capital and operational costs over six years for the proposed phase 1 service areas.

Flexible station systems are able to reduced costs by incorporating many of the fixed station features into the bike itself. While flexible station models can reduce costs because of their technology innovation, there are trade-offs associated with meeting user needs. These trade-offs should be considered when selecting a bike share vendor and technology. For more on the differences in technology and their estimated costs, please see the *Paying For Bike Share* chapter of this report.

Selecting Bike Share Technology

Given the bike share technology considerations, it is recommended that the cities of Atlanta and Decatur define the system components desired for their bike share service and include the technology requirements as part of a solicitation for interested bike share vendors and operators. This type of approach will ensure both cities get a system based on their needs rather than allowing a particular vendor or technology define the type of system to be used. More information about using a solicitation process is below, included in the table on the following page and in the *Recommendations* chapter of this report.

Selecting a Vendor and/or Operator

The bike share industry has grown exponentially over the past five years in the U.S., and there are now more operators and vendors to choose from. Five years ago, there were one or two vendors and operators capable of providing a bike share system at the city-wide scale. Today, there are several vendors and operators to choose from including viaCycle, which was developed locally at Georgia Tech.

This diversity of vendors and operators means that the cities of Atlanta and Decatur have more options when developing a bike share system. To take advantage of this diversity and the advancements in technology, it is recommended that both cities select a vendor and/or operator through a competitive bidding process. This process can be done jointly or separately.

Most cities use what is referred to as a Request for Proposal (RFP) or Request for Qualifications (RFQ) based on that nature of what is being requested. With either procurement approach, the owner of a contract, in this case one or both cities, issues a formal statement asking interested bidders to submit a proposal. The cities then select the best proposal from those submitted to provide bike share services.

An RFP or RFQ for bike share should include information provided by Atlanta and Decatur and a request for information to be provided by proposers. The table on this page provides a summary of the types of information that should be provided by the owner and the type of information that should be requested from the proposers. Additionally, the *Recommendations* chapter of this report provides more detail about what to include in a call for bids.

Example Bike Share Request for Proposal Components

RFP Segment	Component	Example Information and Language
Information to be provided by the City	Recommended Bicycle Components and Station	<p>The bicycle design should include the following:</p> <p>Step-through frame; adjustable seat; front basket; high stability kickstand; heavy-duty material; chain guard; bicycle bell; secondary lock; disc brakes; lights (automatically activated); fenders; multiple gears; puncture resistant tires; etc.</p> <p>Bicycle-specific parts (non-interchangeable with other bicycles)</p> <p>Other theft/vandalism deterring methods (GPS tracking, etc.)</p>
	Overview of Program Scope	<p>Program scope information should include:</p> <p>Size of service area; Phasing; Amount of bicycles/stations</p>
	City's Provision of Right-of-Way	<p>Example text:</p> <p>The City will assist in the provision of public space in order to site bike share stations.</p> <p>The City will maintain all rights to determine appropriate siting of the stations.</p>
	Required Hours of Operations	<p>Example text:</p> <p>The system will operate 365 days a year, 24 hours per day.</p> <p>The system must be able to completely shut down should weather or other incidents require its closure.</p>
	Specific Performance Standards	<p>Example text:</p> <p>95% of bikes must be operational at all times.</p> <p>The operator is required to share data regarding the usage of the system, as outlined in the RFP.</p> <p>Any vandalism to the system must be remediated by the operator within a specific time period.</p> <p>Distribution standards for stations and bicycles will be set between the operator and the City i.e. percentage of time station spent full/empty, etc.</p>
	Outlined Contract Incentives and Adjustments	<p>Specify revenue sharing or specific incentives for private operators to provide appropriate accessibility and mobility for users.</p> <p>Reserve the right to adjust the contract in the future in terms of expansion, termination, etc.</p>
	Required Operator Qualifications	<p>The City should include specific requirements for vendor experience in mobility services and customer service.</p>
	Provision of Important Reference Documents	<p>The City should provide documents that describe the service areas and document other important information needed to develop a response to an RFP including:</p> <p>Feasibility study information; Maps of existing bicycle infrastructure, transit service, proposed target implementation zones, and other relevant data; GIS data as needed</p>
	Implementation Targets	<p>The City should outline specific targets for implementation such as:</p> <p>The desired timeline for implementation should be within 6 months of the awarding of the contract.</p>
	Maintenance Plan for Bikes and Stations	<p>The proposal should provide an outline for frequency of repairs and tune-ups</p>
Information to be provided by respondents	Plan for Bike Redistribution	<p>Will a vehicle be needed?</p> <p>How many people will be employed?</p>
	Method of Data Collection and Sharing	<p>Operator must provide the performance information to the city on a monthly basis such as:</p> <p>Vehicle miles traveled (per bicycle); Number of trips and duration; number of customers per membership types; Number of bikes in fleet at the end of each month; Etc.</p>
	Comprehensive Marketing/Branding Plan	<p>The proposal should include the administration of an annual customer/user survey.</p>
	Detailed Financial Plan	<p>The financial plan should include elements such as:</p> <p>Estimated capital and operational costs; Estimated usage rates; Charging scheme and fee structure (including deposits for bicycles); Revenue projections, including user revenue, advertising, etc.; Value of assets; Infrastructure replacement costs</p>
	Details of Equipment and Infrastructure	<p>Accurate and specific details about system infrastructure should be provided such as:</p> <p>Bikes and locking mechanism; Customer interface; Back-end system/Call center; Website</p>
	Theft and Losses	<p>Example Request:</p> <p>A detailed and straight forward plan for combating theft must be outlined.</p> <p>A detailed plan for dealing with theft and major vandalism must also be outlined, as well as potential costs incurred.</p>
	Plan for Liability/Insurance Coverage	<p>The liability and insurance coverage should address indemnification for the city and operator.</p>
	Incorporation of Innovative Design/Operational Features	<p>Example Request:</p> <p>Integration with existing transit service is a highly desirable feature for the bike share system.</p> <p>A modular system that requires minimal digging and tie in to utilities is highly preferred.</p> <p>A comprehensive plan for educating users is highly desirable.</p> <p>The ability to provide access to low-income residents is highly desired and alternative payment and deposit options should be considered.</p>

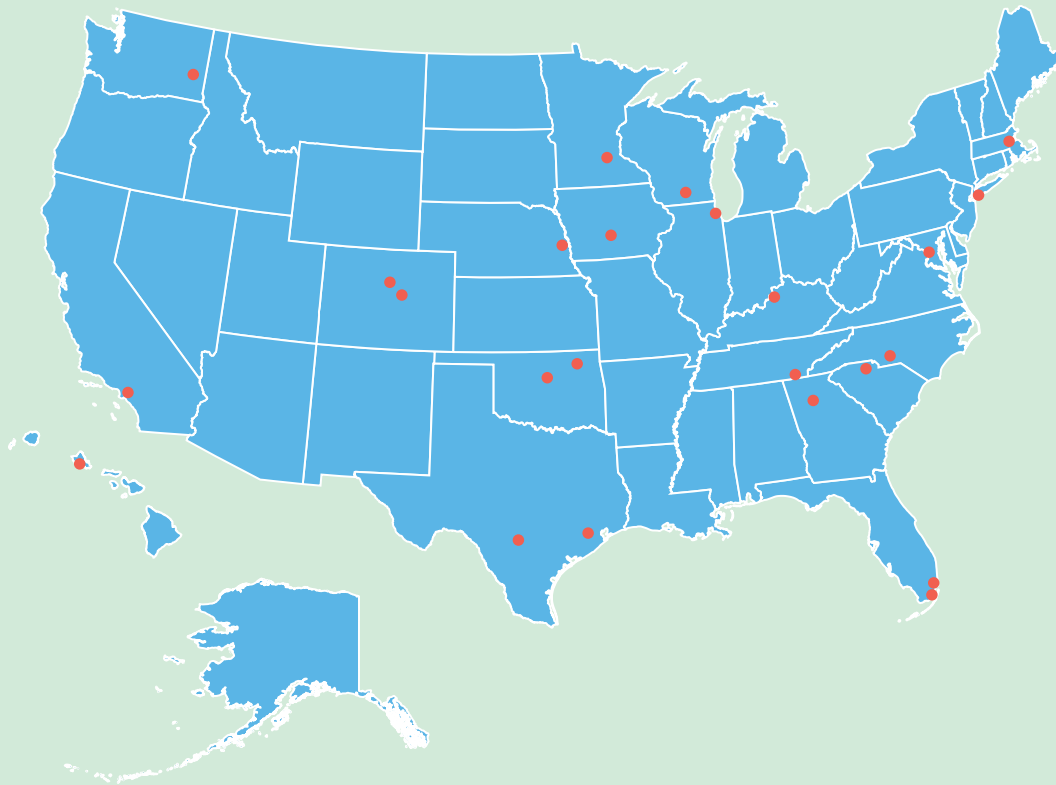
Source: Philadelphia Bikeshare Concept Study, 2010

Bike Share Overview

People + Bikes + Technology = 21st Century Mobility

Bike sharing systems are being implemented around the world as cities look for innovative solutions for 21st century transportation needs. Bike sharing is a technology that has evolved over the past 50 years; however, only in the last 10 years has it expanded rapidly to cities around the globe. With advances in mobile technology, bike share systems allow bikes to be conveniently distributed around cities and available for rental. While the largest and most advanced systems have largely been launched outside of the United States, cities large and small in the U.S. have begun adopting bike share as a way to expand transportation options.

Bike Share Systems in the United States



Bike Chattanooga, 2012

Chattanooga, TN

Boulder B-Cycle, 2011

Boulder, CO

Capital Bikeshare, 2010

Washington D.C., Alexandria and Arlington, VA

Charlotte B-Cycle, 2012

Charlotte, NC

Chicago B-Cycle, 2011

Chicago, IL

DecoBike, 2011

Miami Beach, FL

DecoBike Long Beach, 2012

Long Beach, NY

Denver B-Cycle, 2010

Denver, CO

Des Moines B-Cycle, 2010

Des Moines, IA

Fort Lauderdale B-Cycle, 2011

Broward County, FL

Houston B-Cycle, 2012

Houston, TX

Louisville B-Cycle, 2011

Louisville, KY

Madison B-Cycle, 2011

Madison, WI

New Balance Hubway, 2011

Boston, MA

Nice Ride, 2010

Minneapolis-St. Paul, MN

Omaha B-Cycle, 2011

Omaha, NE

San Antonio B-Cycle, 2011

San Antonio, TX

Spartanburg B-Cycle, 2011

Spartanburg, SC

Spokies, 2012

Oklahoma City, OK

Townies, 2007

Tulsa, OK

viaCycle@GT, Georgia Institute of Technology, 2011

Atlanta, GA

WSU Green Bikes, Washington State University, 2010

Pullman, WA

ZotWheels, University of California at Irvine, 2009

Irvine, CA

History

While the first bike share system was launched in the 1960s, bike share was slow to grow as a technology until better methods of renting and tracking were developed. Some of the technological advances included the growth of mobile phone technology and smartcards. These and other technological developments gave birth to the rapid expansion of bike sharing programs throughout Europe, the Americas, and Asia. There have been four generations of bike share systems over the past 40 years.

First Generation

The first generation of bike sharing programs began in 1964 in Amsterdam with the Witte Fietsen or “White Bikes.” Ordinary bikes, painted white, were put on the street for anyone to use. Individuals were to find a bike, ride it to their destination, and leave it for the next user. Theft, vandalism, and lack of program organization led to the inevitable demise of this system and many others that followed it.

Second Generation

Nearly thirty years later in 1995, a 2nd generation of bike sharing was launched in Copenhagen as Bicyklen, or “City Bikes,” with many improvements over the previous generation. These bikes were specially designed for intense utilitarian use with solid rubber tires and wheels with advertising plates. They could be picked up and returned at bike-share stations throughout the central city with a coin deposit. While more formalized than the previous generation with locking stations and an organization to operate the program, these bikes still experienced a great deal of theft due to the anonymity and lack of accountability of the customer.

Third Generation

Bike sharing system feasibility took a significant leap forward in 1996 with Bikeabout at Portsmouth University in England which utilized a magnetic stripe card for bike checkout. This and the following 3rd generation systems were “smartened” with a variety of technological improvements, including electronically locking racks or bike locks, telecommunication systems, smart cards and fobs, mobile phone access, RFID (radio frequency identification) chips, and on-board computers.

Bike sharing grew slowly in the following years with one or two new programs launching annually, but it wasn’t until 2005 that 3rd generation bike sharing took hold with the launch of Velo’v in Lyon, France and the use of solar panels to power bike share stations. Since then the increased use of solar panels has reduced the need for station construction and stations are now relatively easy to remove and relocate to meet demand or other needs.

While the majority of major bike share systems today operate using fixed stations and kiosks, a flexible third generation system has emerged. This variation on bike share technology integrates most of the enabling features into the bikes. This approach allows bikes to be locked up anywhere without the installation of physical docks to hold bikes while not in use. The first system to use this technology was Call-a-Bike in Germany, where users received unlocking and locking information via their cell phones. viaCycle, which launched at Georgia Tech in 2011, is another type of system that uses this flexible third generation technology. Many of these systems have yet to be tested at a large scale, with most operating at universities or compact service areas.



The Velib system in Paris is part of the 3rd generation of bike share systems. Many of the systems in the US can be classified as 3rd generation systems.



Fourth generation systems, such as viaCycle are offering new technology that does not require the station infrastructure of 3rd generation systems.

Benefits of Bike Share

The rapid increase in bike sharing in the U.S. and internationally, plus the success of key systems such as Paris's Vélib' and the Washington, D.C. region's Capital Bikeshare, are evidence of the many benefits these popular services deliver. Key benefits include improvements in mobility and accessibility, personal and public health, environment and air quality, financial gains for users and agencies, and a city's enhanced image and reputation for innovation.

Mobility and Accessibility Benefits

By offering new options for short trips, bike share systems enhance mobility and accessibility in the following ways:

Extends the reach of transit

As bike share stations are relatively small and easy to place, they can be located in areas not well served by other modes of transit. This offers the customer a "first and last mile" solution in assisting them to reach destinations that would previously have required a longer walk or transit vehicle transfer.

Encourages transit use

By reducing wait time and modal transfer time, bike share encourages many to shift from single occupant vehicle to transit. Studies have indicated that the trip time associated with waiting for or transferring to a transit vehicle is perceived to be two to three times as onerous as the actual travel time.¹ With an on-demand bike sharing component in conjunction with a rail system, the wait time between transfers will decrease; therefore, customers likely will be retained and new transit customers attracted.

Relieves pressure on crowded transit routes

By providing an easy and quick way to connect transit stops, riders may use bike share to access a less crowded station or skip the rail or bus portion completely and bike instead.

Reduces dependence on personal auto use

Surveys conducted by Nice Ride Minneapolis and Capital Bikeshare in the Washington, D.C. region estimate that between 7 - 20% of total bike share trips replaced a single-occupant-vehicle trip.^{2,3}

Encourages bicycle use in general

Data from Paris and Minneapolis indicate increases in both bicycle sales and ridership levels since the introduction of their bike share systems.



Bike share serves as a form of public transit and also supplements existing transit service.

Health Benefits

It has long been known that regular exercise such as bicycling can lead to physical fitness and improved health, specifically in its capability to reduce obesity, heart disease, diabetes, and other ailments caused by sedentary lifestyles. One of the best ways to increase physical activity is to incorporate it into activities of daily living, such as transportation for commuting, errands, social life, and other trips. Bike sharing can make “active transportation” easily accessible to increasing numbers of people.

In fact, the health benefits of bike share programs are being embraced by the health care industry and the Centers for Disease Control and Prevention (CDC). Health care companies Kaiser Permanente and BlueCross BlueShield of Minnesota are among the sponsors of bike share systems in Minneapolis and Denver. The CDC’s Communities Putting Prevention to Work grant program specifically names bike share as one effective strategy to combat obesity and other lifestyle diseases.^{4,5}

Environmental Benefits

Bike share systems have the potential to significantly reduce air pollution, including greenhouse gases such as CO₂. Montreal’s Bixi system claimed to have decreased 3,000,000 pounds of greenhouse gases in roughly its first year of operation and Lyon claimed a 18,600,000 pound reduction in its first four years of operation.⁶ These numbers can only increase as bike sharing grows in popularity.



Bike share can improve public health by providing a healthy, active transportation option.

Innovation and City Image

The phenomenal popularity and growth of key U.S. bike share systems are testimonial to a much-quoted declaration from Gilles Vesco, Vice President of Greater Lyon, reflecting on the success of Velo'v: "There are two types of mayors: those who have bike share, and those who want bike share."⁷

The reasons for his enthusiasm are many. Lyon officials estimate that bike sharing has eliminated tons of pollutants since its inception in 2005. Considered to be a city less than friendly to cyclists prior to 2005, the Velo'v program is credited with stimulating an increase of 500% in bicycle trips within the city, a quarter of which were due to the bike sharing system. But more than that, officials say, Velo'v has changed the face of the city.

"The critical mass of bikes on the road has pacified traffic," said Gilles Vesco. "Now, the street belongs to everybody. It has become a more convivial public space."⁸

The success of early systems such as Capital Bikeshare, in Washington, D.C., and San Antonio B-Cycle have demonstrated the capability of bike share to offer solutions to a myriad of challenges facing U.S. cities. Capital Bikeshare's system has been embraced not only by residents wanting more convenient transit connections and better commutes but also by the thousands of visitors to the nation's capital. The system is so popular that it has expanded to offer service on the National Mall, traditionally a site that is carefully guarded against development and businesses that might affect the historical significance of the monuments.

Championed by Mayor Julian Castro, San Antonio B-Cycle was the first modern bike share program implemented in Texas. San Antonio is now ranked as the second-busiest B-Cycle city in the nation, behind only Denver, with an average of more than 6,700 riders per day logging a total of more than 106,000 miles.

Like other U.S. systems, San Antonio B-Cycle was part of a larger city agenda to improve public health and reduce obesity in addition to offering convenient transportation in its downtown core. The City has alarmingly high rates of childhood obesity and diabetes and is often ranked in the top five most obese cities in America. Mayor Castro has said, "The overwhelming success of San Antonio B-Cycle has proven that San Antonio is a model city for bike sharing and as we work toward creating a fitter city, the bike share program encourages a more active and healthy lifestyle."⁹ Finally, San Antonio B-Cycle is a chief factor in the city achieving its first appearance on the "America's Top 50 Bike-Friendly Cities" list released each year by *Bicycling Magazine*.

That bike share systems can also enhance a city's reputation for innovation is clear from the corporate and community partners that have signed on to help launch and run the systems. New York City will soon launch the largest system in the U.S., with 10,000 bikes at 600 stations. Named "Citi Bike" the system has received a sponsorship of \$45 million from CitiBank who will brand the system with its trademark royal blue. In addition, MasterCard will sponsor the payment processing system to the tune of \$6.5 million.¹⁰ Having two such corporate giants attach themselves to bike share can only mean the concept has reached critical mass and will be embraced by dozens more U.S. cities in the years to come. Chicago plans to launch its system of 3,000 bikes and 300 stations in 2013.¹¹



Cities such as Lyon, France have found bike share improves the public image of the city.



San Antonio has used bike share to expand transportation options in its downtown and improve its image as an active, healthy city.

Bike Share Components and Technology

The popularity and operational success of bike share systems is due in part to the technological advances that make the systems so user-friendly. The components of the systems are the bikes, stations, and back-end system.

Bikes

The bike share systems utilize bikes designed specifically for short trips in urban conditions. Bikes are designed for universal use, meaning one size fits all, and mobile features and other technology are integrated into the bike to allow the system to function effectively. Below are some of the key features of bike share bikes:

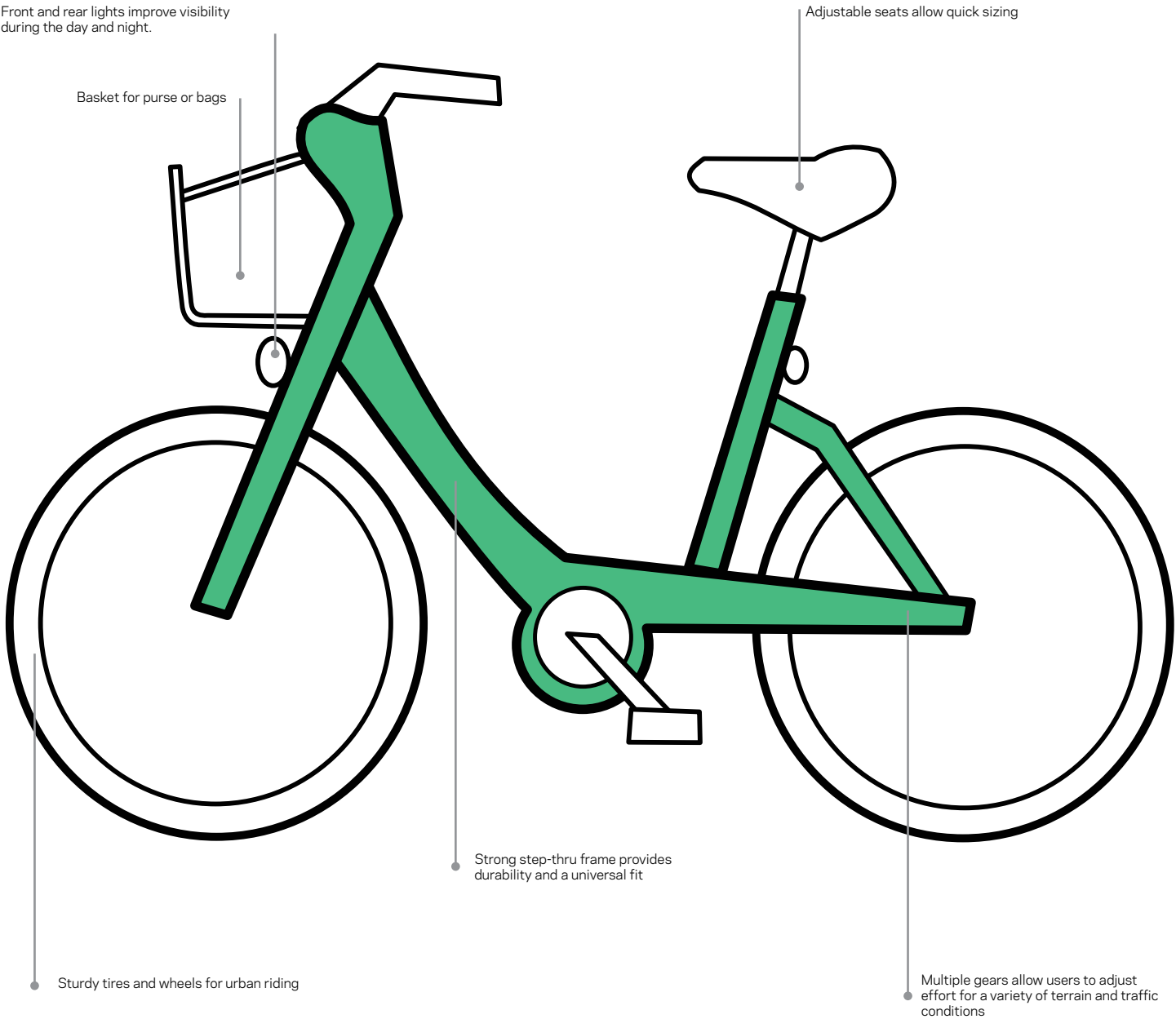
- Upright step-thru frame design suitable for any level of bicycling skill or experience
- Quick-release adjustable seat height with theft-deterrent post
- Basket
- Fenders for all-weather riding
- Safety features such as front and rear standing lights, handbrakes, and bell
- Cable lock and key to secure bike while in use and away from a docking station
- Sturdy frames, wheels, and components with puncture resistant tires
- Chainguard and skirtguard to protect users from grease and road debris, and to prevent pant legs or skirts from snagging in the drivetrain
- 3-speed or greater internal gearing
- Radio frequency identification (RFID) to uniquely identify each bike when parked and to monitor trip distance, duration, calories burned, carbon offset, and other information
- GPS to track exact route data

Bike share bikes also have several design features that help secure them when not in use and that help deter theft or vandalism. Many of the standard bicycle components found on bike share bikes, such as gears, brakes and wheels, are uniquely designed and only work with bikes for the particular system. Because many of the parts can not be used with regular bikes, bike share parts typically have little to no after-market value. The reduced value and functionality of bike share parts outside the system help discourage theft.

The other key features of bike share bikes are their locking mechanisms. For most systems, bike share bikes have two locking mechanisms.

All bike share systems have some form of an integrated locking mechanism that allows bikes to be checked out and returned to the system for others to use. Typically, this mechanism is a part of the bike and the docking stations and locks the bike to the station or bicycle rack. These mechanisms often include small LED lights that indicate the bike is ready to be unlocked or that it has been successfully returned to the system for someone else to use. This locking mechanism helps deter theft by indicating bikes are properly locked when returned to a station. Additionally, the locking mechanism secures a bike when not in use.

In addition to the main locking mechanism, some bike share bikes have an additional cable lock built into the bike. This locking feature allows users to lock up a bike while in use but not returned to a station. For users, this means the bikes can be secured while checked out. It also builds in convenience for users by allowing them to access areas that do not have a station near-by.



Automatic front and rear lights improve safety, especially for riding at night.



GPS and other technology is often built into the bike.



Locking mechanisms are either completely or partially built into the bike, depending on the system technology.

Stations

A bike sharing station is composed of one terminal, possibly a map frame with or without an advertisement, and multiple docks. The terminal is the brains of the station and may be accessed by “casual” customers (such as tourists) with a credit or debit card after reading and agreeing to electronic terms of usage on a screen. The terminal may also offer features such as an additional period of minutes should the station be full with bikes, a customer’s recent billing statement, or bike availability at nearby stations. Many vendors offer a terminal that is solar-powered and utilizes wireless communication, making it relatively easy to relocate and expand as users’ travel patterns change.

Depending on the bike share vendor, bicycles may be checked out with the swipe of a credit or debit card, tap of a smart card or fob, or through a phone call or SMS via mobile phone. Long term customers may also check out a bike directly from a dock to keep from having to wait to use a terminal that is already in use by another customer.

Most bike share stations are modular and may have the number of docks increased or decreased in size relatively easily. Docks may have a LED light that will turn green to signify a bike is being successfully checked out or red to signify a bike is being locked as it needs repair. A maintenance button on the dock is sometimes included which allows a customer to report a bike needing repair.

The map frame provides a local and/or regional map of nearby stations to assist the customer with trip planning as well as usage instructions. Some bike-share services also include a sponsor message or advertisement to assist with revenue generation. A public service message may be included instead, as has been the case with jurisdictions that don’t allow outdoor advertising.

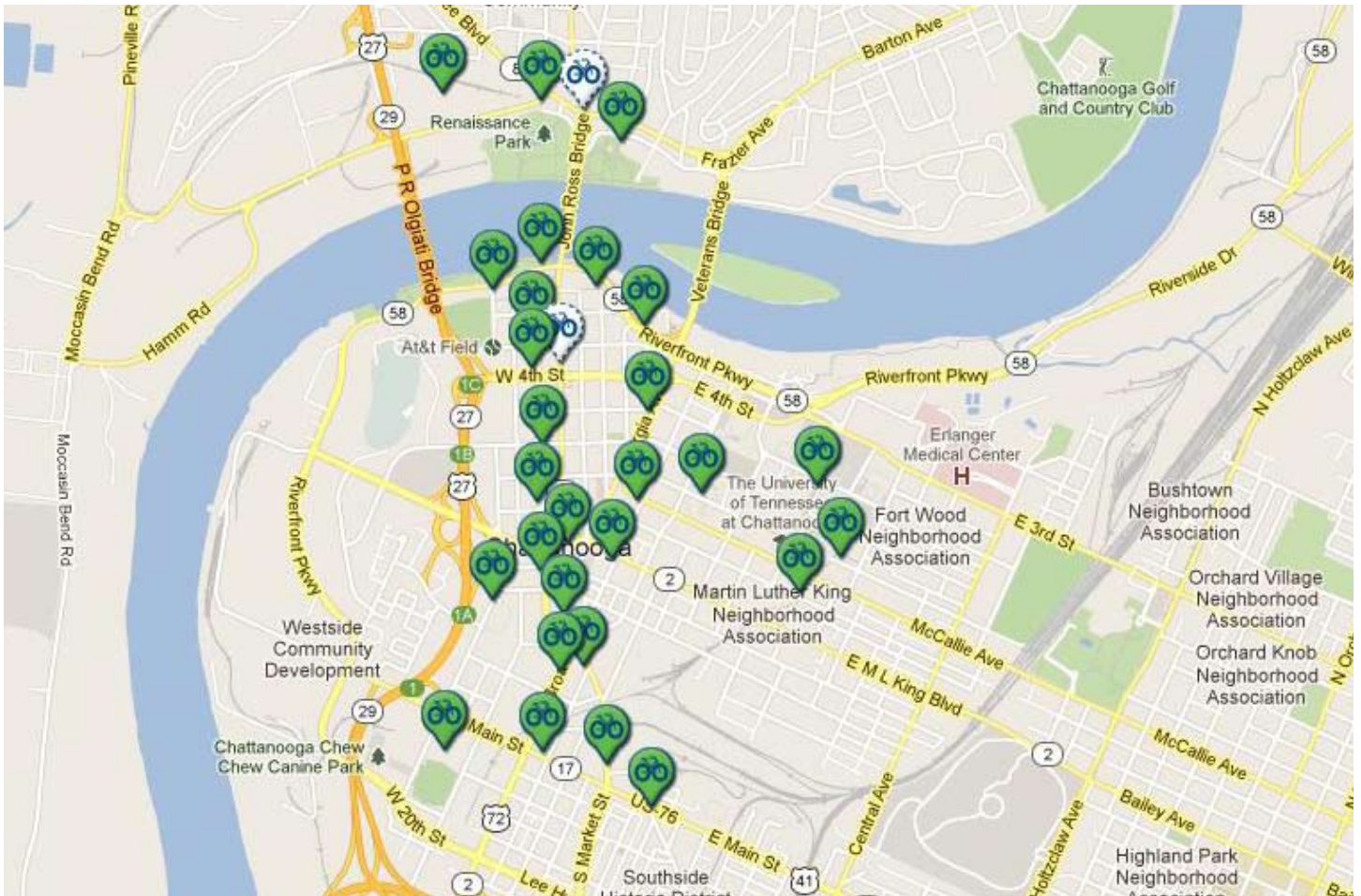
A network of stations consisting of terminals or kiosks plus individual bicycle docks is the most common method of fixed bike sharing; however, some vendors offer a flexible version that allows bikes to be locked at locations not associated with stations. This latter method of flexible stations is not preferable due to customers’ wanting to know where to go to find a bike for rent as well as the operator knowing where to find bikes for balancing and maintenance operations.

Back-end System

The back-end system integrates the bikes, docks, and terminals of a station and manages the membership database, bike locations, component operational status, payment processing, and operator management. Back-end data, such as bike and dock availability, may be provided to the public as well with real-time website and mobile device applications.

In addition to this management, the back-end system provides a variety of reporting functions, such as tracking:

- the number of docks and bikes at any location;
- the functional status of any bike, dock, or terminal;
- the usage patterns of stations;
- the financial reporting per station;
- miles ridden, calories burned, carbon footprint, and other information.



Bike stations are dispersed around a city, such as Chattanooga above, to provide access to a variety of destinations.



Bike stations often include several basic elements, including kiosks, signage, dedicated locking mechanisms and docking spaces, bikes and power sources to power the stations.

Bike Share Organizational Models

While there are several distinct types of operational models for current bike share systems, there is much overlap between these models due to unique characteristics of each municipality and the many factors influencing successful operation of bike share. These factors include:

- Capability of an agency or municipality to create and maintain a new public service
- Availability of funding and constraints on different types of funding
- Political environment
- Liability - both actual and perceived
- Prioritization of performance measures, e.g., revenue goals, transportation equity, service area expansion, mode shift goals, etc.

Bike share organization models include government, transport agency, university, non-profit, advertising company and for-profit. This section discusses reasons for using each of models.

Government

In the government model, the locality operates the bike sharing service as it would any other transit service. The government of Burgos, Spain, purchased and operates an off-the-shelf bike sharing system called Bicibur. With this model, the government as operator has greater control over the program. However, the government may not have the experience that existing bike share operators have in managing a program. Additionally, the government maintains liability for the program, which can be less desirable from a government's perspective.

Public-private partnership

The public-private partnership model has one or more jurisdictions administering the service and selecting an operator/equipment vendor. Examples of this model are Capital Bikeshare in the Washington, D.C. region and Hubway in the Boston region. The jurisdiction is responsible for administering, funding, marketing, and a public process for station siting.

With this model, the jurisdiction has control over the service as it is the administrator. This model allows the jurisdiction to shift liability from itself to the operator by requiring the operator to be responsible for the service, maintaining insurance and indemnifying the jurisdiction.

Non-Profit

The non-profit model has an organization which was either expressly created for the operation of the service or one that folds the bike share service into its existing interests. Examples of non-profit programs include The City Bike Foundation of Copenhagen, which operates Bycyklen, and Nice Ride Minnesota, which operates in Minneapolis and St. Paul. While the non-profit operates the program, it may receive funding from the jurisdiction for the service it provides to the public in addition to collecting the revenues generated by membership and usage fees and sponsorships.

The non-profit model benefits the locality as it removes liability from it and places the liability on the non-profit, which has limited funding and is less likely to be sued. A detriment of this model is the non-profit can be reliant on the public sector for a majority of its funding if it isn't active in obtaining sponsors and advertisers to sufficiently cover its capital and operating expenses.

Bike Share Organizational Models

Model	Owner	Operator	Advantages	Disadvantages	Example
Government	Same	Same	Jurisdiction has greater control over program.	Agency may not have expertise to create effective system. Places all financial risk and liability on agency.	Bicibur - Burgos, Spain
Public-Private Partnership	Government	Private company	Jurisdiction has greater control over program. Private operators have experience and expertise. Private entities may have greater incentive to perform. Shifts risk from public to private sector	Still some risk to public agency.	Capital Bikeshare - Washington, D.C. region
Non-Profit	Same	Same or 3rd party	Flexibility of funding sources Minimizes financial risk to public agency	Can become too reliant on public agency for funding. Non-profit may not have expertise to operate system.	Nice Ride Minnesota - Minneapolis, MN
For-Profit	Same	Same or 3rd party	Entrepreneurial initiatives not subject to public approval or permitting Private operators have experience and expertise Greater incentive to meet performance measures	Public funding options not available. Station placement and growth may favor more profitable areas rather than serving those with most need City/agency has less control over where system operates. Must have City approval to operate in right-of-way.	Deco Bike - Miami Beach, FL
Transport Agency	Same	Same or 3rd party	Bike sharing fits transit agency mission and mandate Administrative framework already exists Flexibility of funding sources including FTA grants, public funds and sponsorship Ensures system will serve public transportation needs	Places financial risk on transit agency Transit agency may not have expertise to create effective system Motorized and train transit-dominant thinking may curtail innovation.	Deutsche Bahn and Call-a-Bike - various cities in Germany
Advertising Company	Same	Same or 3rd party	System provided at no cost to agency in exchange for permission to advertise on public space. Less financial risk to agency	Agency has little control on system operation or growth. City codes often restrict new outdoor advertising, thereby limiting company's revenues. Company may have little incentive to improve or grow system.	Velib' - Paris, France
University	Same	Same or 3rd party	Campuses can take action to address their own transit needs without approval of local municipality	Smaller systems can be started and operated for less. Without involving surrounding city, system may have limited reach outside campus.	ZotWheels - University of California, Irvine, CA

Private For-Profit

In the for-profit model, a private company provides the service with limited government financial support. Miami DecoBike is a prime example of this model, with a local business running the service in a locality with the equipment provided by Sandvault. While similar to the advertising company model, this model differs because the operator is focused on bike sharing as an end, rather than on bike sharing as a means to obtain public space for advertising as an end. In the case of the upcoming NYC CitiBike service, the operator, Alta Bicycle Share, is responsible for paying for all capital and operating costs through sponsorship, advertising, and membership and usage fees, and sharing a percentage of its profits with the city.

A benefit of this model is that the private sector can start a service as an entrepreneurial activity rather than wait for the public sector to do so. A detriment is that the for-profit may not receive funding assistance for the service as do programs offered under other models. Additionally, if the for-profit uses a fixed, versus flexible, system, they would need to have the locality's support to use public space, unless all stations are on private property.

Transport Agency

The transport agency model has a quasi-governmental organization providing the service. The transport agency's customer is a jurisdiction, region, or nation. Deutsche Bahn, a transit agency in Germany, is a prime example. Deutsche Bahn is the national railway provider for Germany. In addition to rail operation, Deutsche Bahn operates a car sharing service and a bike sharing service called Call-a-Bike. Deutsche Bahn started offering bike share as an extension of their other transport offerings in order to be a well-rounded mobility provider.

The benefit of the quasi-government transport agency model is that the jurisdiction benefits from the experience and innovation of the bike-sharing service provider, especially in the case of national Deutsche Bahn, without needing to develop the capabilities internally. Additionally, both the jurisdiction and transport agency's top priority is to provide a useful transit service rather than generating revenues, which is discussed in more detail below as a detriment in the advertising company and for-profit models. A detriment of this model is that, without the locality releasing a tender for the service, a more qualified operator may exist than the transport agency operator.

Advertising Company

With the advertising company model, companies such as JCDecaux, Clear Channel Outdoor, and Cemusa offer a bike-sharing program to a jurisdiction, usually in exchange for the right to use public space to display revenue-generating advertisements on billboards, bus shelters, and kiosks. The benefit of this model is it can be convenient and cost-effective for local governments that could not afford to provide the bike-sharing service otherwise. A detriment with the advertising company model is the problem of moral hazard. The advertising company usually does not benefit from revenues generated by the system, as the revenues usually go to the jurisdiction, so the advertising company may not have the same incentive to operate the program as if the revenues were directly related to their level of service, regardless of what they agreed to in a service contract.

In one case, the advertising company provides the bike-sharing service for a fee and not for an advertising contract. In Barcelona, B:SM (Barcelona de Serveis Municipals), a company owned by the city, has contracted with Clear Channel Outdoor to operate the service. This model is similar to the transport provider model, as the contractor happens to be an advertising company but its advertising services are not used. This model once existed in the U.S. with SmartBike DC, but presently there are no outdoor advertising companies offering this domestically.

University

The university model has the educational institution providing the service, most likely in a campus setting. Examples are the former program at the University of Portsmouth, England, and newer incarnations such as ZotWheels at the University of California-Irvine, and viaCycle at Georgia Tech in Atlanta. The benefit of this model is that the university can expand its intra-campus transit service without relying on the local government to offer sufficient bike share service on campus. A detriment is that the surrounding community could potentially not benefit from the service unless it was opened to the adjacent neighborhoods. Additionally, if the local government were to use another system, there could be compatibility issues with the university's system.

Transportation Equity and Bike Share

As bike share takes hold in the U.S. and systems grow in popularity, the question of equity has arisen: Are these public transportation systems available to citizens at all levels of the socio-economic strata? Initial surveys conducted by Capital Bike share and other systems have indicated that a disproportionate percentage of subscribers are predominately white from higher income brackets. This has caused concern that the systems are too costly for low-income people, or that stations are not being placed in low-income neighborhoods, among other possible factors.

Some of the elements of bike share programs that may lead to an equity gap are:

- **Membership requirements:** systems that require a user to have a credit card may shut out people who do not qualify for consumer credit cards.
- **Security deposit:** a large up-front charge to use the system may be out of reach for some potential users with a debit card only.
- **Electronic access to system:** can people who do not own personal computers or smart phones use the system as easily as those who do?
- **Lack of community outreach:** are low income citizens who may benefit from bike-share hearing about the program?
- **Station location and service area:** in planning the service area, was bias shown toward higher-end commercial areas such as downtowns, or areas with city attractions and higher rents?
- **Bicycling infrastructure:** are bike lanes, cycle tracks, trails, and other facilities present in all neighborhoods?
- **Connectivity:** can residents of low-income neighborhoods get where they want/need to go by bicycle?
- **Access to helmets and other gear:** are bicycle shops and other retail within easy reach of lower income areas?

Bike share programs are beginning to acknowledge possible equity gaps and addressing these issues. Capital Bikeshare has instituted a monthly installment payment plan which allows individuals to purchase an annual membership for \$7 per month rather than a one-time fee of \$75 to make it feasible for low-income people to access the system. Capital Bikeshare also has partnered with an organization called Bank on DC which provides a discounted annual membership of \$50 and helps an un-banked individual open a checking account, thereby gaining access to a secured credit card account with a credit limit created by the individual's deposit amount. Arlington and Washington, D.C. also offer free cycling instruction classes in Spanish, have a call center which offers assistance in Spanish, and has instruction materials at the station in Spanish to ensure outreach to the Hispanic community.

Additional strategies will need to be pursued to make bike-share available to everyone, including:

- Allowing a transit fare card to access the system
- Subsidizing memberships through various social services programs
- Outreach to under-served neighborhoods and communities
- Bicycle education through schools and recreation programs
- Making helmets and other gear available through the bike-share program itself
- Targeting public input to low-income neighborhoods during the station planning phase

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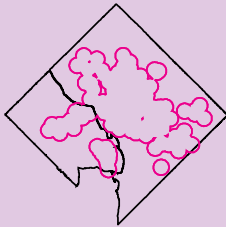
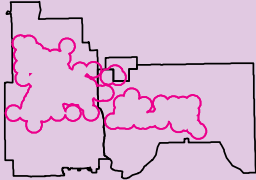


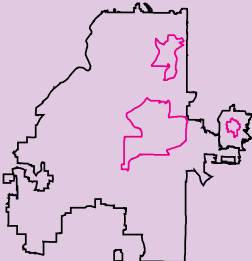
Case Studies

Learning from peer systems

Atlanta and Decatur stand to benefit from the lessons learned with other systems. Existing bike share systems can be instructional in terms of the needed size for a system, how to own and operate a system, the transportation benefits and challenges, what environments best support bike sharing and how to pay for a system. For this study, case studies were selected to give perspective on the different operational models, city contexts and scales experience by peer cities. Additionally, viaCycle, which is a bike share company launched at Georgia Tech, is included to illustrate how bike sharing is already being used locally.

It should also be noted that bike sharing is still a new and growing technology. Many of the systems around the U.S. are growing rapidly, both in terms of their infrastructure and the number of users. Combined with more widely available funding, rapidly improving technology, and a greater diversity of bike share system operators, bike share systems in many peer cities have yet to find their true size or capacity.

Case Study Scale, Context and Operational Comparison

<p>Capital Bikeshare</p> <p>Washington DC Arlington, VA Alexandria, VA</p> 	<p>Population (2010)</p> <p>Area</p> <p>Population Density</p> <p>Bike Share Service Area</p> <p>Number of Stations</p> <p>Stations Per Square Mile</p> <p>Number of Bikes</p> <p>Number of Bikes Per Station</p> <p>Launch Year</p>	<p>809,350</p> <p>94 sq mi</p> <p>8,574 people/sq mi</p> <p>41 sq mi</p> <p>174</p> <p>4</p> <p>1,279</p> <p>7</p> <p>2010</p>
<p>NiceRide Minnesota</p> <p>Minneapolis, MN St. Paul, MN Falcon Heights, MN</p> 	<p>Population (2010)</p> <p>Area</p> <p>Population Density</p> <p>Bike Share Service Area</p> <p>Number of Stations</p> <p>Stations Per Square Mile</p> <p>Number of Bikes</p> <p>Number of Bikes Per Station</p> <p>Launch Year</p>	<p>672,967</p> <p>116 sq mi</p> <p>5,805 people/sq mi</p> <p>39 sq mi</p> <p>145</p> <p>4</p> <p>1,328</p> <p>9</p> <p>2010</p>
<p>DecoBike Miami Beach</p> <p>Miami Beach, FL Surfside, FL</p> 	<p>Population (2010)</p> <p>Area</p> <p>Population Density</p> <p>Bike Share Service Area</p> <p>Number of Stations</p> <p>Stations Per Square Mile</p> <p>Number of Bikes</p> <p>Number of Bikes Per Station</p> <p>Launch Year</p>	<p>93,523</p> <p>8 sq mi</p> <p>11,134 people/sq mi</p> <p>7 sq mi</p> <p>113</p> <p>17</p> <p>800</p> <p>7</p> <p>2011</p>
<p>viaCycle at Georgia Tech</p> <p>Georgia Institute of Technology, Atlanta, GA</p> 	<p>Population (2010)</p> <p>Area</p> <p>Population Density</p> <p>Bike Share Service Area</p> <p>Number of Stations</p> <p>Stations Per Square Mile</p> <p>Number of Bikes</p> <p>Number of Bikes Per Station</p> <p>Launch Year</p>	<p>27,258</p> <p>0.6 sq mi</p> <p>45,430 people/sq mi</p> <p>2 sq mi</p> <p>8</p> <p>4</p> <p>40</p> <p>N/A</p> <p>2011</p>
<p>City of Atlanta and Decatur</p> 	<p>Population (2010)</p> <p>Area</p> <p>Population Density</p> <p>Bike Share Service Area</p> <p>Number of Stations</p> <p>Stations Per Square Mile</p> <p>Number of Bikes</p> <p>Number of Bikes Per Station</p>	<p>439,338</p> <p>94 sq mi</p> <p>4,654 people/sq mi</p> <p>14.1</p> <p>57</p> <p>4</p> <p>570</p> <p>10</p>

 municipal/institutional boundary

0 5 10


 service area (1/4 mile buffer around all stations)

Capital Bikeshare

Servicing Washington D.C. and Arlington, VA, Capital Bikeshare has been in operation since September 20, 2010 and currently has approximately 1,500 bicycles and 169 stations. The system is the successor of the significantly smaller SmartBike D.C. program that was in operation between 2008 and 2010 with 120 bikes and 10 stations. Capital Bikeshare is owned by the District of Columbia (population 618,000) and Arlington County (population 208,000) with a private operator, Alta Bicycle Share, which is responsible for the maintenance of the system, operation and balancing. The system's equipment provider is Public Bicycle System Company.

Over its first year of operation the system exceeded ridership expectations, reaching its one-millionth ride on the first anniversary of the system's operation and two millionth trip only 8 months later. The coverage area in Washington, D.C. includes downtown and inner neighborhoods, with station density decreasing further from the core. Outermost neighborhoods have little to no coverage. Arlington's coverage includes its two dense Metrorail corridors: the Rosslyn-Ballston corridor, which has five Metrorail stations, and the Route 1 corridor, which has three Metrorail stations. Surrounding jurisdictions, including Alexandria, VA and Montgomery County, MD, are planning to expand Capital Bikeshare to their communities with about 8 and 50 stations respectively. Both D.C. and Arlington have system expansion plans that will add roughly 75 new stations over the next year.

Capital Bikeshare was funded by a mixture of Federal (CMAQ), State (Demonstration fund - Virginia Department of Rail and Public Transportation), Local (Arlington - Vehicle Decal Fee) funds, sponsor resources and operating revenues.

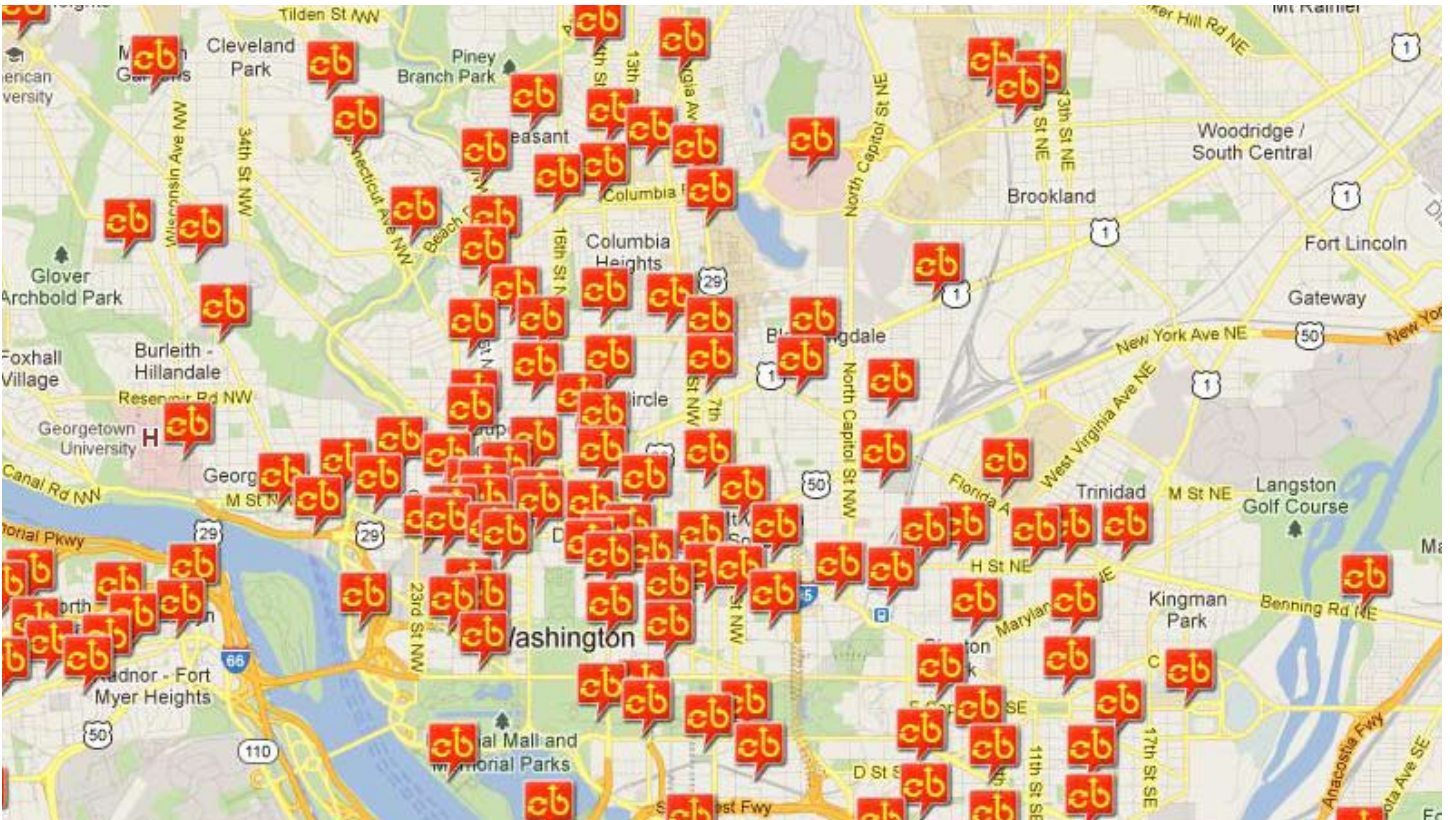
Capital Bikeshare Summary Table

Jurisdiction(s)/Institutions	
People ¹	809,350
Area	94 sq mi
People per square mile	8,574
Number of Jurisdictions	2
% of bicycle commuters ²	3.1% / 1.4% / 0.7%
Bike Share System Metrics	
Service Area	41 sq mi
Number of Stations	174
Stations Per Square Mile	4
Docks Per Station	11-41
Number of Bikes	1,279
Number of Bikes Per Station	7
Members	
Annual Members	19,200
Casual Users	105,444
Operations	
Launch Year	2010
Operations Model	Government owned, private operator
Year-Round vs. Seasonal	Year-round
# of trips ³	1,000,000 trips per 365 days
Annual Members: Avg. Trips per month	92.7
Casual Users: Avg. Trips per day	4

1. Population data is based 2010 Census.

2. Bike commuter data based on 2010 American Community Survey 1-year estimates; Data is for Washington D.C., Arlington, VA and Alexandria, VA, respectively.

3. Trips in first year

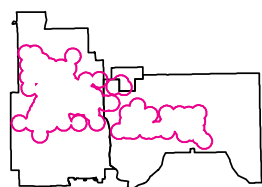


The Capital Bikeshare system covers portions of Washington D.C., Arlington, VA and Alexandria, VA.



Capital Bikeshare is one of the largest bike share systems in the U.S. with over 1,200 bikes and just under 20,000 annual members.

Nice Ride Minnesota



NiceRide Minnesota

Minneapolis, MN

St. Paul, MN

Falcon Heights, MN



Based in Minneapolis and now St. Paul, Nice Ride was launched on June 10, 2010. It served over 10,000 trips in its first month and reached 100,817 rides in the first season of operation. The system presently offers 1,200 bicycles for rent at 116 stations in both Minneapolis (population 383,000) and St. Paul (population 285,000), making it the second largest bike-share system in the country. Nice Ride operates from the first week of April through the first week of November due to the harsh winters of the region. The bikes and stations are removed during the winter in order to protect them from corrosion from road salt and clear the street for snow plows.

The Nice Ride system was first put in place in areas near downtown Minneapolis and has been expanded in multiple phases. The system expanded into western areas of neighboring St. Paul in Summer 2011 and is expected to have its first stations deployed in downtown St. Paul in June 2012, bringing the total number of bikes to 1,328 and stations to 146.

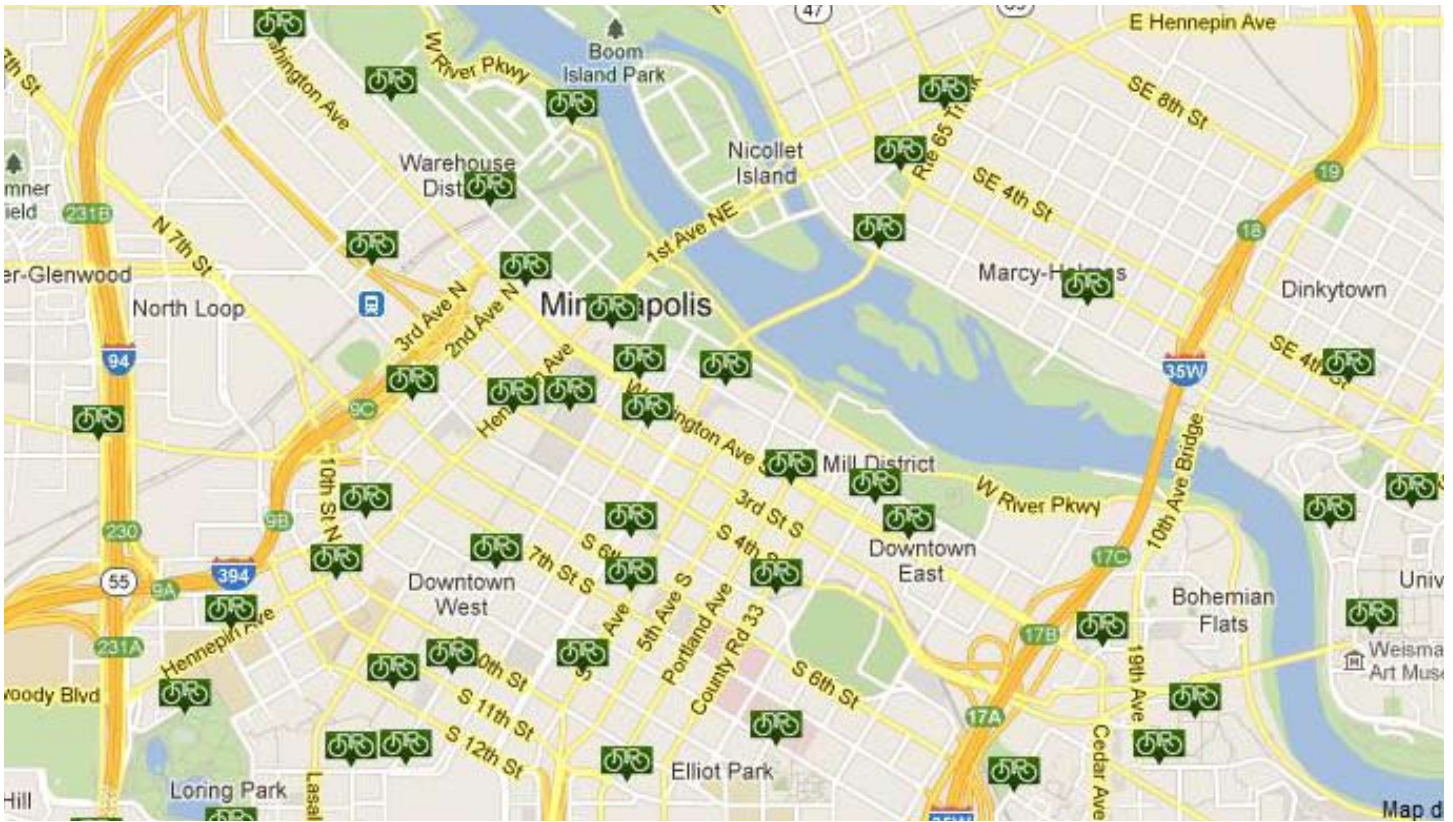
Nice Ride is operated by a non-profit which started the service with \$3.2 million in funding. Major contributors included Blue Cross Blue Shield of Minnesota, the City of Minneapolis, a federal transportation grant from the Nonmotorized Transportation Pilot Program, and the National Park Service. The system's equipment provider is Public Bicycle System Company.

Nice Ride Summary Table

Jurisdiction(s)/Institutions	
People ¹	672,967
Area	116 sq mi
People per square mile	5,805
Number of Jurisdictions	3
% of bicycle commuters ²	3.5% / 0.9% / n/a
Bike Share System Metrics	
Service Area	39
Number of Stations	145
Stations Per Square Mile	4
Docks Per Station	11-41
Number of Bikes	1,328
Number of Bikes Per Station	9
Members	
Annual Members	3,521
Casual Users	37,103
Operations	
Launch Year	2010
Operations Model	Non-profit owned and operated
Year-Round vs. Seasonal	Seasonal (closed Nov. through Mar.)
# of trips	217,530 trips per 212 days
Annual Members: Avg. Trips per month	43
Casual Users: Avg. Trips per day	2.5

1. Population data is based 2010 Census.

2. Bike commuter data based on 2010 American Community Survey 1-year estimates; Data is for Minneapolis and St. Paul. Falcon Heights data is not available.



Nice Ride services portions of Minneapolis, St. Paul and Falcon Heights, MN.



Nice Ride has adopted to the non-profit model to own and operate the bike share system in Minneapolis-St. Paul.



DecoBike Miami Beach

Miami Beach, FL

Surfside, FL



DecoBike Miami Beach

Miami Beach's DecoBike system is the first successful private for-profit bike-share system operating in the U.S. DecoBike, LLC partnered with the City of Miami Beach (population 88,000) to launch the system in March 2011. DecoBike has since launched systems in Surfside, FL, and Long Beach, NY.

Beginning with 550 bikes, within the first year Miami Beach's system expanded to 800 bikes distributed throughout 91 stations. As of March 2012, the system had logged close to 720,000 rides, with 100,000 in February alone. By the end of its first year, 4% of the City's residents had subscribed to the long-term membership option, and the program celebrated its first anniversary financially in the black.

It's worth noting the unique marketing approach DecoBike has taken to promote bike-share in Miami Beach. Along with the typical benefits all bike-share systems offer and promote, such as "green" transportation, convenience for short trips, enhancement to public transit systems, DecoBike is actively marketing a "sexy" image associated with bike-share. Its website features bikini-clad women riding the bikes, and the company has engaged high-profile, attractive athletes and other Miami Beach personalities to be ambassadors for the program. While a bit of a departure from the image of most other bike-share concepts, it is a positive example of fitting a universal transportation system to the unique context of the locality, promoting the idea that bicycling -- and bike-share -- truly is for everyone.

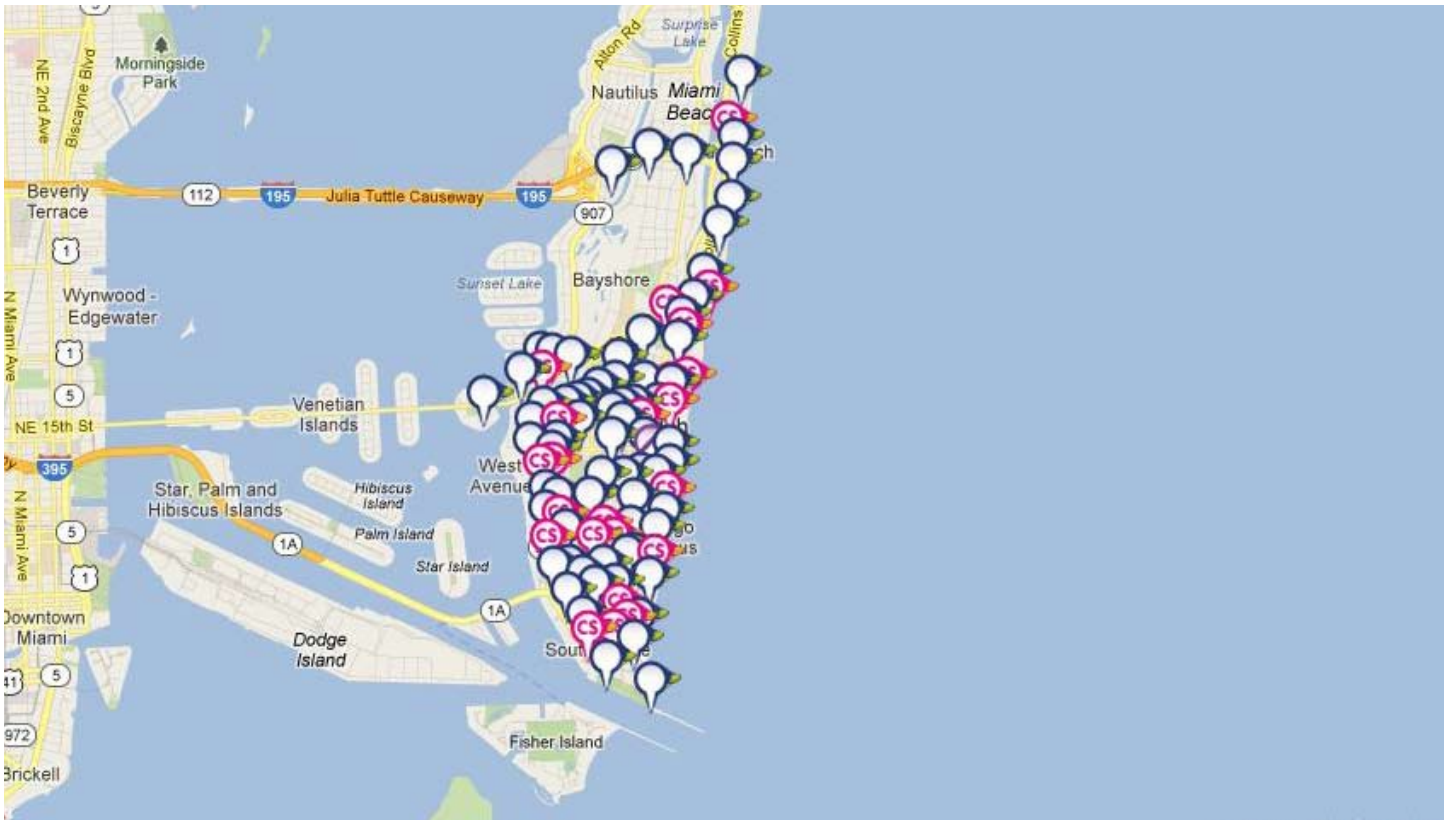
The service is funded through higher than standard membership and usage fees and a corporate sponsorship by KLM Airlines.

DecoBike Summary Table

Jurisdiction(s)/Institutions	
People ¹	93,523
Area	8 sq mi
People per square mile	11,134
Number of Jurisdictions	2
% of bicycle commuters ²	5.0% / n/a
Bike Share System Metrics	
Service Area	7
Number of Stations	113
Stations Per Square Mile	17
Docks Per Station	13-20
Number of Bikes	800
Number of Bikes Per Station	7
Members	
Annual Members	2,500
Casual Users	Data not available
Operations	
Launch Year	2011
Operations Model	For-profit owned and operated
Year-Round vs. Seasonal	Year-round
# of trips	540,000 trips per 274 days
Annual Members: Avg. Trips per month	n/a
Casual Users: Avg. Trips per day	n/a

1. Population data is based 2010 Census.

2. Bike commuter data based on 2010 American Community Survey 1-year estimates; Data is for Miami Beach. Surfside data is not available.



DecoBike serves Miami Beach and Surfside, FL.



DecoBike is one of the few for-profit bike share systems in the U.S.



viaCycle at Georgia Tech

Georgia Institute of Technology,
Atlanta, GA



viaCycle at Georgia Tech

viaCycle is a bike share system developed by graduates of Georgia Tech, and is available for use by students, faculty and staff at the campus in Midtown Atlanta. viaCycle differs from other bike share systems in that it installs all the necessary electronic infrastructure on the bicycle itself making it a flexible system, eliminating the need for stations and individual docks.

An electronic lock is the core of the system. Contained in a compact, secured enclosure on each bike, the lock handles all administrative functions, transmitting the usage and location of each bicycle when needed, and constantly monitors for maintenance needs or unauthorized use. A central control unit within the lock is connected to GPS and wireless communication modules, which provide connectivity to viaCycle's central servers and software system. Once registered online, a rider can approach any bicycle with an installed lock and quickly reserve it by calling or texting and entering his or her user PIN and the unique bicycle ID number.

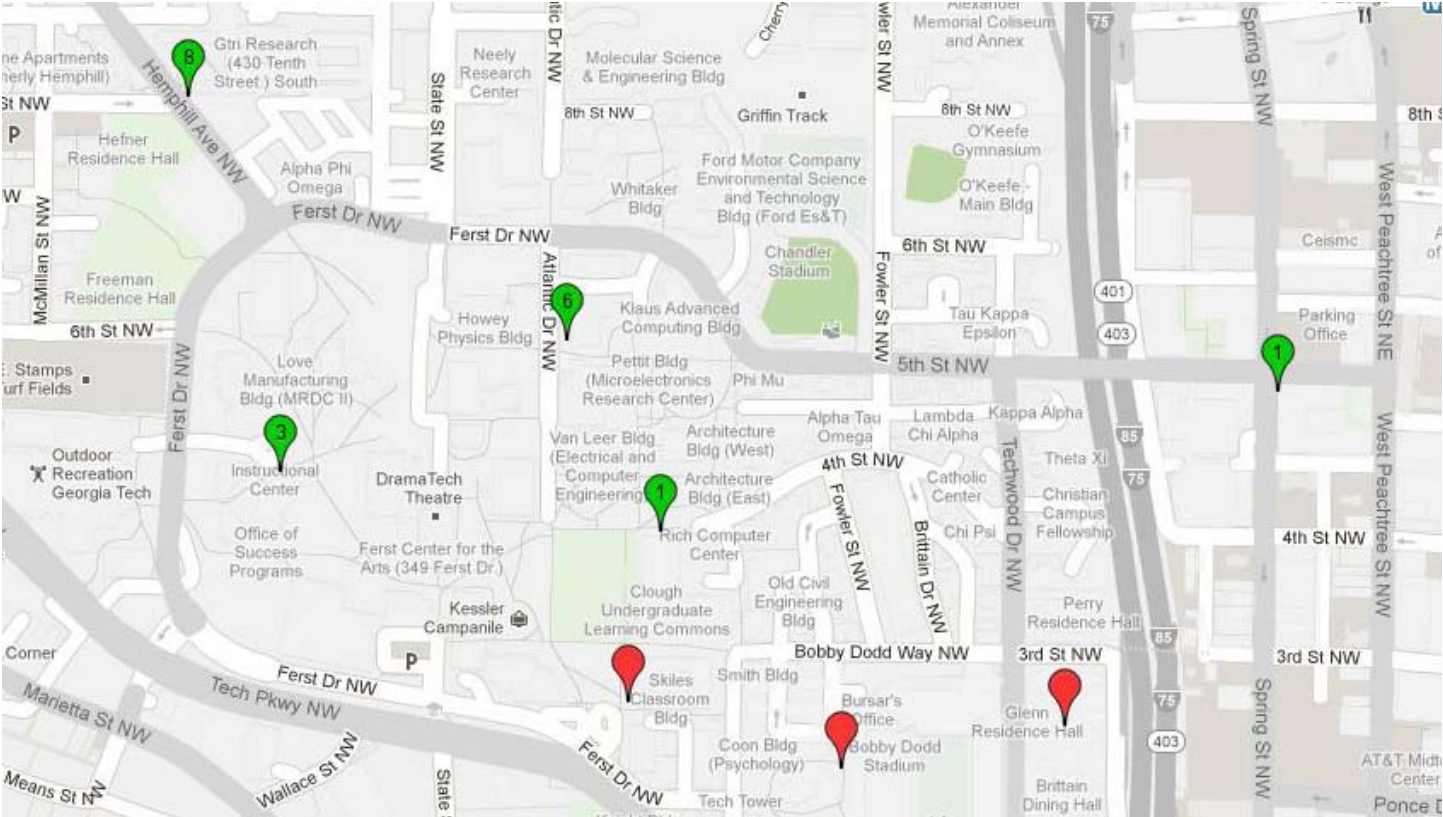
The viaCycle system currently has 40 bicycles for use on the Georgia Tech campus. According to viaCycle's website, the developers are considering plans to deploy the systems outside of the campus as well.

viaCycle at Georgia Tech Summary Table

Jurisdiction(s)/Institutions	
People ¹	27,258
Area	0.6 sq mi
People per square mile	45,430
Number of Jurisdictions	1
% of bicycle commuters ²	5.7%
Bike Share System Metrics	
Service Area	2 sq mi
Number of Stations	8
Stations Per Square Mile	4
Docks Per Station	N/A
Number of Bikes	40
Number of Bikes Per Station	N/A
Members	
Annual Members	600
Casual Users	Data not available
Operations	
Launch Year	2011
Operations Model	For-profit owned and operated
Year-Round vs. Seasonal	School year
# of trips	20,000 trips, Nov 11 - May 12
Annual Members: Avg. Trips per month	n/a
Casual Users: Avg. Trips per day	n/a

1. Population data is based 2011 Georgia Tech Fact Book.

2. Bike commuter data based on 2011 Georgia Tech Commute Survey.



viaCycle currently operates on the Georgia Tech campus in Midtown Atlanta.



viaCycle technology was developed at Georgia Tech and offers members access to 40 bikes and 8 stations on campus.

Fee Schedule Comparison

In addition to documenting the scope, operational model and performance metrics of peer city systems, their membership and usage fees are documented below for comparison. All four systems use standard fee structure found with most bike share systems where users pay a base fee to access the system. With that based fee, users can have unlimited number of trips without being charged additional fees so long as they return the bikes within a certain time period. Typically, these time period is 30 minutes or less. If users have the bike for longer than “free” time period, they incur progressively higher fees the longer the bike is out. This fee strategy is used to encourage riders to take short trips and return the bike to a station for other users.

The most expensive service is DecoBike. The annual membership fee for DecoBike is \$180 to \$300. Additionally, their usage fees are the highest of the four systems as well. The fees are largely the result of the operational model. DecoBike is a For-Profit bike share system that did not receive any money for capital or operation costs. Because the service was not subsidized, the operator has had to charge higher fees to cover the cost of maintaining and operating the service.

The membership and usage fees for Capital BikeShare and NiceRide are roughly the same. Sixty to seventy dollars buys an annual membership and \$5-7 buys a daily pass.

viaCycle offers the cheapest rates, but it is also heavily subsidized through student fees at Georgia Tech. Membership is only available at a monthly rate and is also only available to students, faculty and employees of Georgia Tech. If the system is scaled up to serve the general public and a larger service area, these fees will likely have to be adjusted higher to generate sufficient revenue.

Membership Fee Comparison

System	Annual	Month	3-Day	24-hour
Georgia Tech viaCycle				
Prime	n/a	\$5.95	n/a	n/a
Standard	n/a	\$0	n/a	n/a
Nice Ride Minnesota	\$60	\$30	n/a	\$5
Capital Bikeshare	\$75	\$25	\$15	\$7
Miami DecoBike	\$180 - \$300 ¹	\$15 - \$25	n/a	\$24

1. Annual membership not available; Based on monthly membership rate multiplied by 12 months

Usage Fee Comparison

System	0-30 min	30-60 min	60-90 min	90-120 min	Each 30 min thereafter	Each 1hr thereafter	Max 24-hr charge
Georgia Tech viaCycle							
Prime	\$0	\$0	\$0	\$0	+ \$1 - \$2	-	\$17.95
Standard	\$0	\$0.45	\$0.95	\$1.95	+ \$1 - \$2	-	\$19.95
Nice Ride Minnesota	\$0	\$1.50	\$4.50	\$10.50	\$6.00	-	-
Capital Bikeshare							
Members	\$0	\$1.50	\$4.50	\$10.50	\$6.00	-	\$70.50
Casual Users	\$0	\$2.00	\$6.00	\$14.00	\$8.00	-	\$94.00
Miami DecoBike	\$0	\$4.00	\$8.00	\$12.00	\$4.00	-	-

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Cycling Conditions in Atlanta and Decatur

The state of cycling today

If launched, a bike share program will significantly increase the number of people biking in Atlanta and Decatur. To understand how both cities could accommodate a bike share system, a comprehensive review of community conditions was compiled. The review gives a snap shot of the state of cycling in Atlanta and Decatur and looks at factors that can influence the implementation of a bike share system. Trends, existing facilities, access and mobility considerations and transportation costs are all reviewed to paint a complete picture of cycling in Atlanta and Decatur today.



Trends

To understand cycling today in Atlanta and Decatur, it is important to know not just how many people are riding, but why and how riding has changed over time. Additionally, there are other factors that influence cycling rates, such as public health and perception of safety. The sections below provide an overview of cycling rates and related trends.

Commuting

As a transportation option, bicycling is still a small portion of all commute trips. According to estimates in the American Community Survey, cycling represented 0.9% and 0.7% of all commute trips in 2010, respectively, for Atlanta and Decatur. Nationally, 0.6% of commute trips are by bike.

In addition to increasing cycling rates, bike share can also benefit other non-motorized travel, such as walking and public transportation. Alternative transportation facts highlight this possibility.

When biking is combined with public transit and walking, the alternative transportation mode share is 16.4% and 9.2%, respectively, for Atlanta and Decatur. Considering these figures, approximately 1 out of every 10 commuters could potentially use bike share for a portion of their commute. In total, that is just under 33,000 commuters.

Compared national rates, the share of alternative transportation commuters for Atlanta and Decatur is above the national rate of 8.5% but below the 23% rate for the 50 largest US cities. Even in Atlanta and Decatur, which presumably represents the most walkable, bikeable and transit-served areas in the Atlanta region, traveling to work is still largely done by car.

Comparing year over year trends, Atlanta and Decatur have experienced significant growth in bicycle commuting. From 2000-2010, bicycle commuting in Atlanta increased 194%. In Decatur, the increase was even more pronounced, with bicycle commuting increasing by 747%. In actual numbers, the number of bicycle commuters increased by 1,092 and 127, respectively, for Atlanta and Decatur.

In addition to nationally available data, the Atlanta Bicycle Coalition collects local bicycle data. While their data only covers Atlanta and does not cover Decatur, it can still highlight some interesting local trends.

Of the 16 sites used to collect data in 2009 and 2010, only 3 sites had available data from all four seasonal counts (spring and fall) conducted for both years. Two of the sites were at intersections, which include the intersection of Glenwood and Flat Shoals and North Highland and St. Charles. The street count was along North Decatur Road between Atlanta and Decatur.

For all three locations, there was a positive increase in the number of bicyclists counted. At the intersections, ridership increased by 1.4% and 13.5%, respectively, at Glenwood and North Highland. Along North Decatur Road, ridership increased by 10.6%.¹

All of these numbers show that cycling, as a mode of transportation, is increasing in Atlanta and Decatur.



Bike commuting has increased over the past ten years in Atlanta and Decatur.

National Commuting Trends in 2009

	% of all commuters		% of All Trips Nationwide
	Nationwide	Top 50 Largest US Cities	
Private Vehicle or Other	91.5%	77.0%	86.6%
Public Transportation	5.0%	17.2%	1.9%
Bicycle	0.6%	0.9%	1.0%
Walking	2.9%	4.9%	10.5%

Source: Alliance for Walking and Biking, "Bicycling and Walking in the United States: 2012 Benchmarking Report," 2012

Atlanta and Decatur Commuters in 2010

	City of Atlanta		City of Decatur	
Car, truck, or van:	141,648	75.2%	16,988	85.0%
Public Transit+Bike+Walk	30,951	16.4%	1,833	9.2%
Public transportation (excluding taxicab):	21,538	11.4%	1,098	5.5%
Bicycle	1,654	0.9%	144	0.7%
Walking	7,759	4.1%	591	3.0%
Taxicab, motorcycle, or other means	3,191	1.7%	256	1.3%
Worked at home	12,636	6.7%	920	4.6%
Total	188,426	100.0%	19,997	100.0%

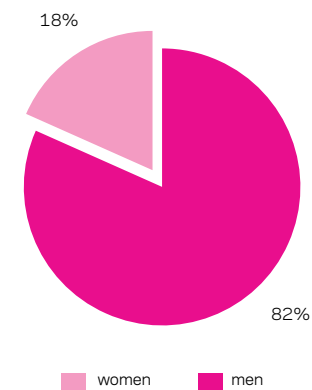
Source: American Community Survey 2010 (1-Year Estimate) for Atlanta; American Community Survey 2010 (5-Year Estimate) for Decatur

Atlanta and Decatur Commuting Trends 2000-2010

City of Decatur	2000	2010	% increase '00-'10	Commuter Increase
Car, truck, or van:	7,620	16,988	123%	9,368
Public transportation (excluding taxicab):	993	1,098	11%	105
Bicycle	17	144	747%	127
Walking	567	591	4%	24
Taxicab, motorcycle, or other means	63	256	306%	193
Work at home	480	920	92%	440
Total	9,740	19,997	105%	10,257
City of Atlanta				
Car, truck, or van:	136,741	141,648	4%	4,907
Public transportation (excluding taxicab):	26,893	21,538	-20%	-5,355
Bicycle	562	1,654	194%	1,092
Walking	6,261	7,759	24%	1,498
Taxicab, motorcycle, or other means	1,772	3,191	80%	1,419
Work at home	6,741	12,636	87%	5,895
Total	178,970	188,426	5%	9,456

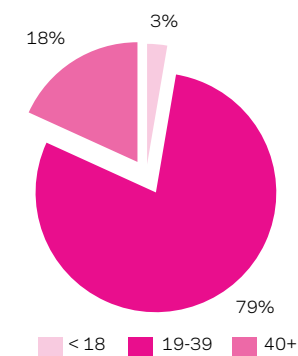
Source: US Census 2010; American Community Survey 2010 (1-Year Estimate) for Atlanta; American Community Survey 2010 (5-Year Estimate) for Decatur; For workers age 16 and over

Cycling Rates by Gender



Source: Atlanta Bicycle Coalition, 2010

Cycling Rates by Age



Source: Atlanta Bicycle Coalition, 2010

Who is riding?

Bicycle commuting in the Atlanta area is still largely a male activity. Of the bicycle commuters counted by the Atlanta Bicycle Coalition in 2009 and 2010, 82% were male and 18% were female. By comparison over the same period, the national distribution is 76% male and 24% female.

By age, the Atlanta Bicycle Coalition counts illustrate who is riding for commuting. Three percent of the commuters were under the age of 18, 79% between 18-39, and 18% over the age of 40. Today, bicycle commuting is predominately an activity of younger commuters. However based on the data, it is difficult to determine whether this distribution is driven by ability, generational preferences, or location of jobs.²

Safety

Biking and walking safety is an important component of bike share. Riding a bike needs to be a safe transportation option to encourage potential customers to use a system. Additionally, it is important to address pedestrian safety. Most bike share users will start or end their trip by walking.

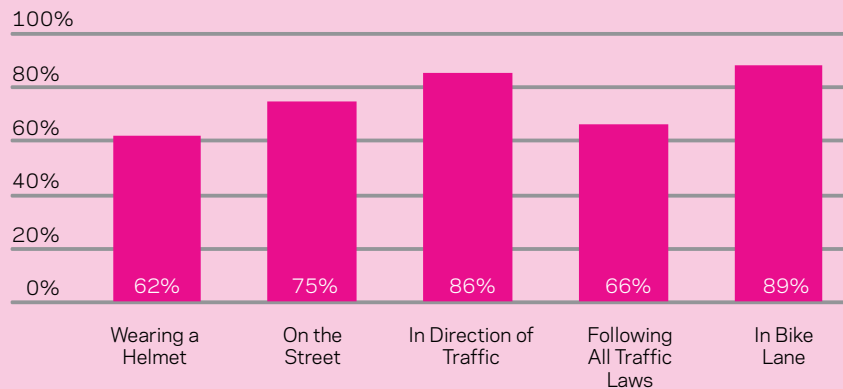
Of the 50 largest cities in the U.S., Atlanta is the 17th safest for bicyclists and 23rd safest for pedestrians. This figure takes into consideration population and levels of cycling and walking.³

While national trends show steady decreases in the number of pedestrian and bicycle fatalities, pedestrians and bicyclists are still exposed to higher risk levels relative to their share of commute type. Nationally, bicyclist traffic fatalities decreased by 27% and pedestrian traffic fatalities decreased by 24% from 1995 to 2009. However for the same 50 cities mentioned above, 3% of all traffic fatalities were bicyclists and 23% were pedestrians. Comparatively, bicyclists represented 1% of all trips and pedestrians represented 10.5% of all trips nationally in 2009.⁴

This national trend of increased risk exposure is present in Atlanta and Decatur. When traffic fatality rates are compared to commute rates, the numbers show that bicycles and pedestrians share greater fatality rates relative to their rate of commuting. Bicyclists comprise 1.2% of all traffic fatalities in Atlanta; 25.4% are pedestrians.⁵ Comparatively, bicyclists represent 0.9% and 0.7% of commute trips and pedestrians represent 4.1% and 3.0% of commute trips, respectively, for Atlanta and Decatur.

How people ride bikes is also important for safety. In 2009 and 2010, the Atlanta Bicycle Coalition collected additional rider data as part of their regular bicycle counts. Of those counted, 62% wore helmets, 75% rode in the street, 86% rode in the direction of traffic and 66% were following all traffic laws. Where a bike lane was available, 89% of the riders counted were using it. These figures show that bicycle commuters are relatively safe but that there is room for improvement through education and enforcement.

Cyclist Behavior in Atlanta



Source: Bike Count 2010. Atlanta Bicycle Coalition, 2010

Public Health

There are direct correlations between the levels of walking and biking in communities and public health. The 2012 Benchmarking Report by the Alliance for Walking and Biking compared commuting rates for adults and children walking and biking to school or work and adult and childhood obesity trends. For adults commuting to work and children walking and biking to school, decreases in walking and biking rates over the past 50 years have resulted in increases in adult and childhood obesity.

For the Atlanta region, 64% of the population is overweight (which includes obese) and 25% are obese. Additionally, 8% of the population have been told they have diabetes; 7% of have been told they have asthma; and 27% have had hypertension.

Bike sharing can be a part of the solution to improve public health. By giving people the opportunity to incorporate physical activity as part of their commute, they can improve their health. For comparison, the CDC recommends for adults 18-64 years of age 150 minutes of moderate intensity activity each week.⁶ Nationally, 40% of all trips in the US in 2009 were shorter than 2 miles (a 15 minute bike ride) and 27% of trips were 1 mile or less (an 8 minute bike ride). For these trip distances, 62% of Americans drive for trips less than 1 mile and 87% drive for trips between 1 and 2 miles long. Trading a bike for a car is reasonable for these trip distances and can help people meet the recommendations for physical activity.

Air quality is also a significant health factor to consider when discussing transportation. By federal standards, the Atlanta Region is in non-attainment because current levels of particulate matter and ozone, two of the six pollutants regulated by the Clean Air Act, are too high.

Both ozone and particulate matter have been shown to aggravate health problems associated with heart and respiratory diseases, as well as those with asthma. Increases in blood pressure and heart rate have been attributed to breathing some particulate matter. The impacts on respiratory health are short and long term. Short term, exposure to smog has been linked to coughing, shortness of breath and fatigue. Long term, research has shown that children with chronic exposure to smog to have higher risks of developing asthma and decreased lung development.⁷

Looking at local data, approximately 1 out of every 10 days from 2007-2011 required a smog alert. Additionally, approximately 1 out of every 10 days from 2007-2011 were classified as unhealthy for sensitive groups.

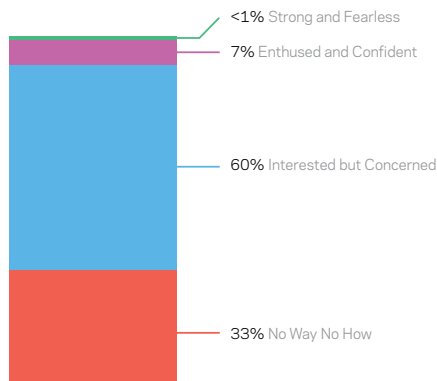
By law, the State of Georgia, Atlanta Regional Commission and local governments are required to show improvements in meeting federal air quality standards in order to receive federal transportation funding. The improvements, or "conformity," are tied to project transportation improvements associated with the regional transportation plan, or RTP.⁸ While not currently in the RTP for the Atlanta region, bike sharing can contribute to improved air quality by reducing vehicle emissions.

Air Quality 2007-2011

	2007		2008		2009		2010		2011		2006-2011	
	Days Observed	% of Days Observed	Days Observed	% of Days Observed	Days Observed	% of Days Observed	Days Observed	% of Days Observed	Days Observed	% of Days Observed	Total Days Observed	% of Total Days Observed
Smog Alert												
No Alert	36	42%	333	91%	340	96%	326	92%	311	89%	1,346	89%
Smog Alert	49	58%	33	9%	16	4%	29	8%	40	11%	167	11%
Total	85	100%	366	100%	356	100%	355	100%	351	100%	1,513	100%
Air Quality Index Statistics												
Good	113	31%	133	36%	162	46%	142	40%	142	40%	692	39%
Moderate	203	56%	200	55%	178	50%	184	52%	169	48%	934	52%
Unhealthy (for Sensitive Groups)	36	10%	30	8%	16	4%	27	8%	40	11%	149	8%
Unhealthy	13	4%	3	1%	0	0%	1	0%	0	0%	17	1%
Very Unhealthy	0	0%	0	0%	0	0%	1	0%	0	0%	1	0%
Total	365	100%	366	100%	356	100%	355	100%	351	100%	1,793	100%

Source: Clean Air Campaign. Health Advisory: Outdoor Physical Activity and Smog.

Four Types of Transportation Cyclists in Portland, OR



Source: Geller, R. Four Types of Cyclists. 2009

Perception

Reducing the perception of fear and unsafe conditions is key to encouraging more people to bike. Even in Portland, OR, which is one of the most bicycle friendly cities in the country, the perception of safety is still a significant barrier to cycling. In fact, Portland, OR only has 6.0% of their population commuting by bike to work.⁹

Research conducted in Portland highlights how even in one of the most bikeable cities in the US, perception still plays a major role in whether people decide to ride a bike. The research categorized the city's population based on their willingness to ride. Less than 1% are categorized as "Strong and Fearless." These cyclists will ride in any condition, on any road and in any weather condition. Seven percent are categorized as "Enthusied and Confident." These cyclists represent the majority of people riding their bike around the city.

The important distinction is that 60% can be classified as "Interested but Concerned." This figure was developed by removing those who do ride and those who will never ride, which are classified as "No Way No How." The "Interested but Concerned" group identifies the primary barrier to biking as fear. If they felt biking was safe and practical, they would be willing to ride.¹⁰

These facts are included merely to highlight anecdotally how people perceive cycling. Biking should be a fun, safe and healthy activity, and not one guided by bravery versus fear. If bike sharing is to be successful, it will need to address all potential users willing to ride a bike. Based on the experiences in Portland, the majority of potential users need conditions and facilities that improve real and perceived safety.

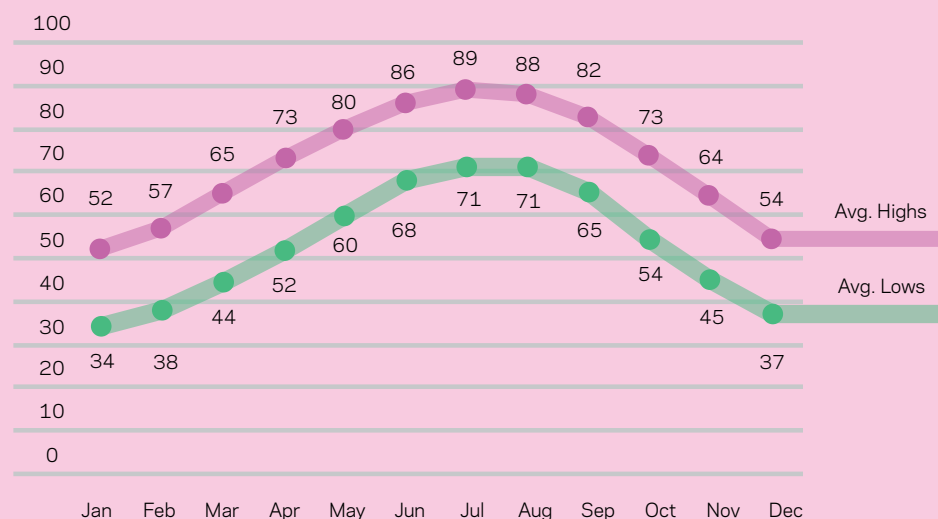
Weather

Weather can have a significant impact on when a bike share system can operate and how willing people are to choose a bike as a means of transportation. Places with extremely cold temperatures, such as Minneapolis and Boston, close their bike sharing operations during winter months. This can have a significant impact on the financial performance and financial model for a bike sharing system.

In Atlanta and Decatur, the temperatures are mild in the winter and hot in the summer, which will allow a bike share system to operate year round. Average highs in the winter are in the 50s and average highs in the summer are in the 80s.

Additionally, inclement weather can have an impact on whether people choose to ride a bike. In Atlanta and Decatur, rain fall amounts are relatively low with average monthly precipitation ranging from 3-5 inches. With low rain fall amounts and moderate temperatures, most people in Atlanta and Decatur can ride comfortably without being negatively impacted by weather.

Atlanta Area Average Temperatures (in Fahrenheit)



Source: The Weather Channel; Zip Code 30326

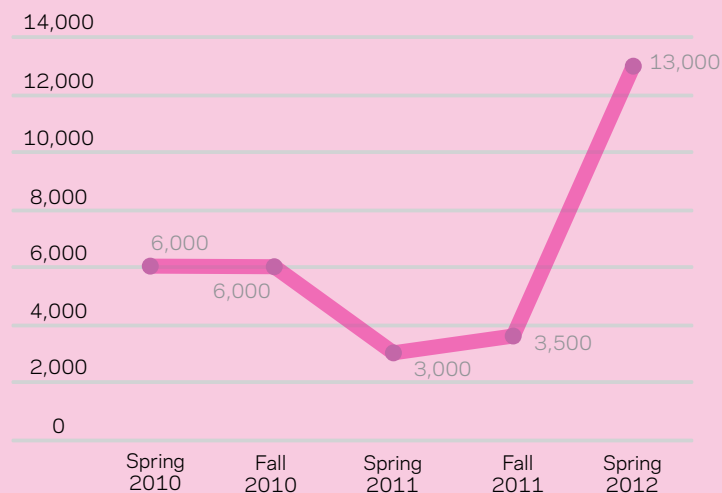
Open Streets Initiatives

Atlanta Streets Alive is the region's version of an open streets initiative. Open streets are events where streets are temporarily closed to vehicles and people are invited to play in the street by biking, walking, dancing or pursuing any activity that gets people moving. The core mission of open streets events is to encourage physical activity, expand community engagement and build support for broader transportation goals.

Atlanta Streets Alive has grown significantly since its creation. From its original participation of 6,000 people in the Spring of 2010, it has grown to an event with 13,000 in May 2012. That is a 117% increase in participation. The event has brought increased awareness about streets as places for people and increased demand for better bicycling in Atlanta and Decatur. But most importantly, it has brought the community together to celebrate cycling and invited people of all ages to be active in the community.

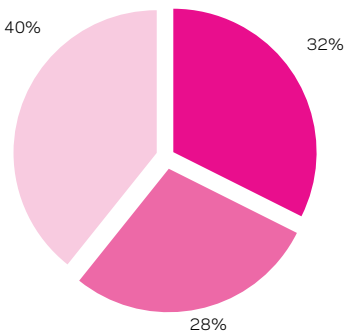


Growth of Atlanta Streets Alive

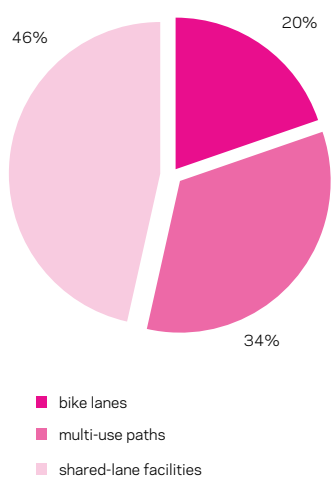


Source: Atlanta Bicycle Coalition

Distribution of Bike Facilities By Type in Atlanta



Distribution of Bike Facilities By Type in Decatur



Facilities

Not only is the frequency of bike facilities important to improve safety and convenience for cyclists, but the type of facilities are important as well. This section documents both the overall coverage of bicycle facilities as well as the types of facilities found in both cities.

Coverage

Bicycle facilities are an important part of a bike share program. Bike lanes, multi-use trails and other infrastructure that encourage safety and convenience can create better cycling conditions for potential users.

In Atlanta, there are a total of 33 miles of bike lanes, 30.1 miles of multi-use paths and 41.6 miles of shared-lane facilities. By percentage, the distribution is approximately 32%, 28% and 40% respectively.

In Decatur, there are a total of 1.4 miles of bike lanes, 2.4 miles multi-use paths and 3.3 miles of shared lane facilities. By percentage, the distribution is approximately 20%, 34% and 46% respectively.

For both cities, the distribution of facilities is similar and telling. Shared lane facilities represent the greatest percentage of all bike facilities. When on-street facilities are compared (bike lanes and shared-lane facilities), the majority of facilities are shared lanes. When dedicated bike facilities (bike lanes plus multi-use paths) are combined, they represent 60% and 54% respectively for Atlanta and Decatur.

If more people are going to be invited to ride in the street with a bike share system, the percentage and total miles of dedicated bike lanes will need to increase. Marking a route with a sign is not sufficient for most people to feel comfortable riding in traffic, especially in urban conditions.

Additionally, multi-use paths are not always convenient or appropriate in urban conditions. Rather than relying on multi-use trails to offer a significant amount of the dedicated bicycle facilities, Atlanta and Decatur will need to find additional street space for bike lanes to increasing comfort and convenience for area cyclists.

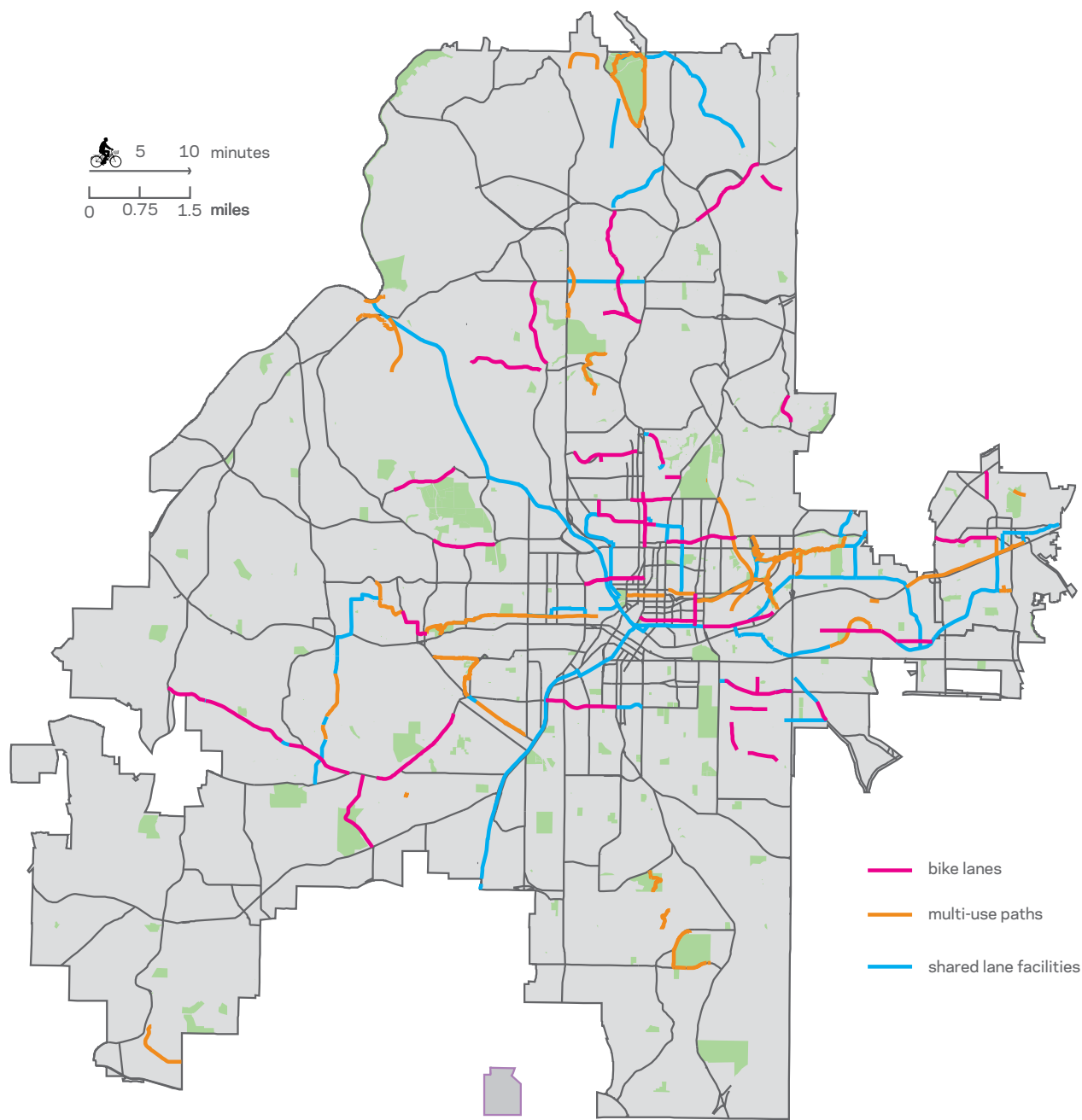
In addition to the tables and charts on this page, the map on the following page illustrates where the different types of facilities in Atlanta and Decatur are located.

Bicycle Facilities

	Atlanta		Decatur		Total	
	Miles	% of Total	Miles	% of Total	Miles	% of Total
Bike Lanes	31.6	96%	1.4	4%	33.0	100%
Multi-Use Paths	27.7	92%	2.4	8%	30.1	100%
Shared Lane Facilities	38.3	92%	3.3	8%	41.6	100%

Source: City of Atlanta; City of Decatur; Atlanta Regional Commission; Atlanta Bicycle Coalition

Bicycle Facility Coverage in Atlanta and Decatur



Facility Type

For the purpose of summarizing the different types of bicycle facilities found in Atlanta and Decatur, they have been grouped into the following categories:

- Bike Lanes
- Multi-Use Paths
- Share Lane Facilities
- Intersection Facilities

Below is a summary table describing these facilities.

Bicycle Facility Types

Bike Lanes



Bike lanes are dedicated on-street facilities that help create separation between bicyclists and vehicles. Most often, bike lanes are wide enough for cyclists to ride single file and are painted with white strips and other bicycle markings.

Atlanta and Decatur are also testing new treatments, where bike lanes are painted green. This type of treatment increases awareness and visibility of bicyclists. Example includes bike facilities at the intersection of W. Ponce de Leon Ave. and Trinity Place in Decatur.

Multi-Use Paths



Multi-use paths are off-street bicycle facilities where cyclists can travel separately from vehicles. Multi-use paths can share a curb with a street and run parallel or they can travel in completely separate directions. Often times paths are used to connect neighborhoods where no streets can connect, such as along a right-of-way easement or to connect people to parks and natural areas. In Atlanta and Decatur, the Path Foundation creates, owns and maintains the majority of multi-use paths. And in Atlanta, the Atlanta BeltLine has created several paths, with the vision to create a loop of trails around the city.

Shared Lane Facilities



Shared lane facilities include two types of facilities: bike routes and sharrows.

Bike routes help bicyclists connect between destinations or to dedicated bike facilities, but they do not include dedicated street space. Often the only thing marking a bike route is occasional wayfinding signage. Shared lane markings, more commonly referred to as sharrows, could be considered the opposite of bike routes. Shared lane markings are painted on a street to bring attention that cyclists are using the route as well. However, they offer no wayfinding instruction and can terminate with no notice.

Sharrows are often placed along highly traveled or locally preferred bike routes, but offer no dedicated or protected space for bicyclists. Shared lane markings are often used when right-of-way restrictions do not allow for on-street bike facilities or when communities do not have enough funds to build dedicated on-street facilities.

Intersection Facilities



Intersections are often the most dangerous place for cyclists because of the increase in conflict points with other riders and drivers. For most intersections, cyclists are forced to share space with vehicles. However, new intersection treatments are being applied in and around Atlanta and Decatur that improve intersection safety for cyclists. While neither city has installed bicycle-specific traffic signals, several intersection facilities have been built. These new facilities include bike boxes and intersection markings. Both street treatments improve safety for cyclists at intersections.

Bicycle Parking

Where to park your bike when you arrive at your destination can be a significant factor in choosing whether or not to ride. Security and space are the main considerations for bicycle parking placement. Bikes in areas that are not highly visible and poorly lit will not be used frequently, and in turn will not encourage people to bike. Just as important as security is placement. Often times bike racks are not functional, do not allow riders to securely lock their bikes or are sited poorly so that the rack can not be used properly.

In Atlanta and Decatur, many of these factors limit the number of people biking to destinations. Bicycle parking varies significantly. Some areas, such as downtowns and activity centers, have bicycle parking policies and programs. For other areas, bicycle parking is left to property owners to provide. Bike sharing can overcome many of these issues by offering highly visible, accessible and guaranteed bicycle parking.



Publicly accessible and well-placed bicycle parking can encourage people to bike by providing a convenient place to secure their bike at their destination.



Inappropriate bicycle parking, or the lack of bicycle parking, can make cycling inconvenient or discouraging.

Access and Mobility

Bike sharing is often used as an extension of public transportation. In Atlanta and Decatur, bike share would primarily build off the MARTA system, which is the 8th largest transit system in the U.S. in terms of ridership and one of only fourteen transit systems in the U.S. with heavy rail service.¹¹ The heavy rail lines are particularly important because the transit stations would likely serve as important connection points to a bike share system. In addition to MARTA transit service, regional transit services, including the Georgia Regional Transportation Authority (GRTA) and other county transit agencies in the Atlanta region, provide transit connections to activity centers in Atlanta and Decatur.

These transit connections are important for local and regional access and mobility to jobs, homes and other daily destinations. This section highlights the links between transit, where people work and how people can bike around Atlanta and Decatur.

Transit Proximity to Home

Access to transit is a key component of bike sharing. Likewise, access to transit is an important part of Atlanta and Decatur’s transportation mobility future. Having access to a bike on either end of a transit trip can reduce commute times and increase convenience.

By proximity, 117,090 residents 18-64 in Atlanta and Decatur, or 38% of the population 18-64, live with 0.75 miles, or a 5 minute bike ride, of a transit station. Additionally, 209, 215 residents 18-64 in Atlanta and Decatur, or 68% of the population 18-64, live within 1.5 miles, or a 10 minute bike ride, of a transit station.

Not everyone can take MARTA to work or for other daily trips. However, if future growth is focused around public transportation to improve mobility options and reduce congestion, bike sharing can improve people’s access to area destinations.

Transit Proximity to Work

Transit access to jobs and where people spend the majority of their day is also an important factor to consider with a bike share program. If jobs are in close proximity to transit stations, choosing transit as a commute option becomes more convenient. Additionally, when people take transit to work, they often don’t have access to a car for doctor appointments, visits to their bank, or other daily tasks people need to complete during the work day. Bike sharing can improve the mobility for people who use transit to commute to work.

By proximity, 226,605 employees, or 47% of the total workforce, of Atlanta and Decatur work within 0.75 miles, or a 5 minute bike ride, of a transit station. Additionally, 314,044 employees, or 66% of the total workforce of Atlanta and Decatur, work within 1.5 miles, or a 10 minutes bike ride, of a transit station. As was mentioned with proximity to transit, not everyone who works in Atlanta and Decatur can use transit to get to work. However, if getting to work at the end of a transit trip was made more convenient, or if it was easier to complete day time trips during work hours, people may choose public transportation over driving.

Proximity of Atlanta and Decatur Residents and Employees to Transit

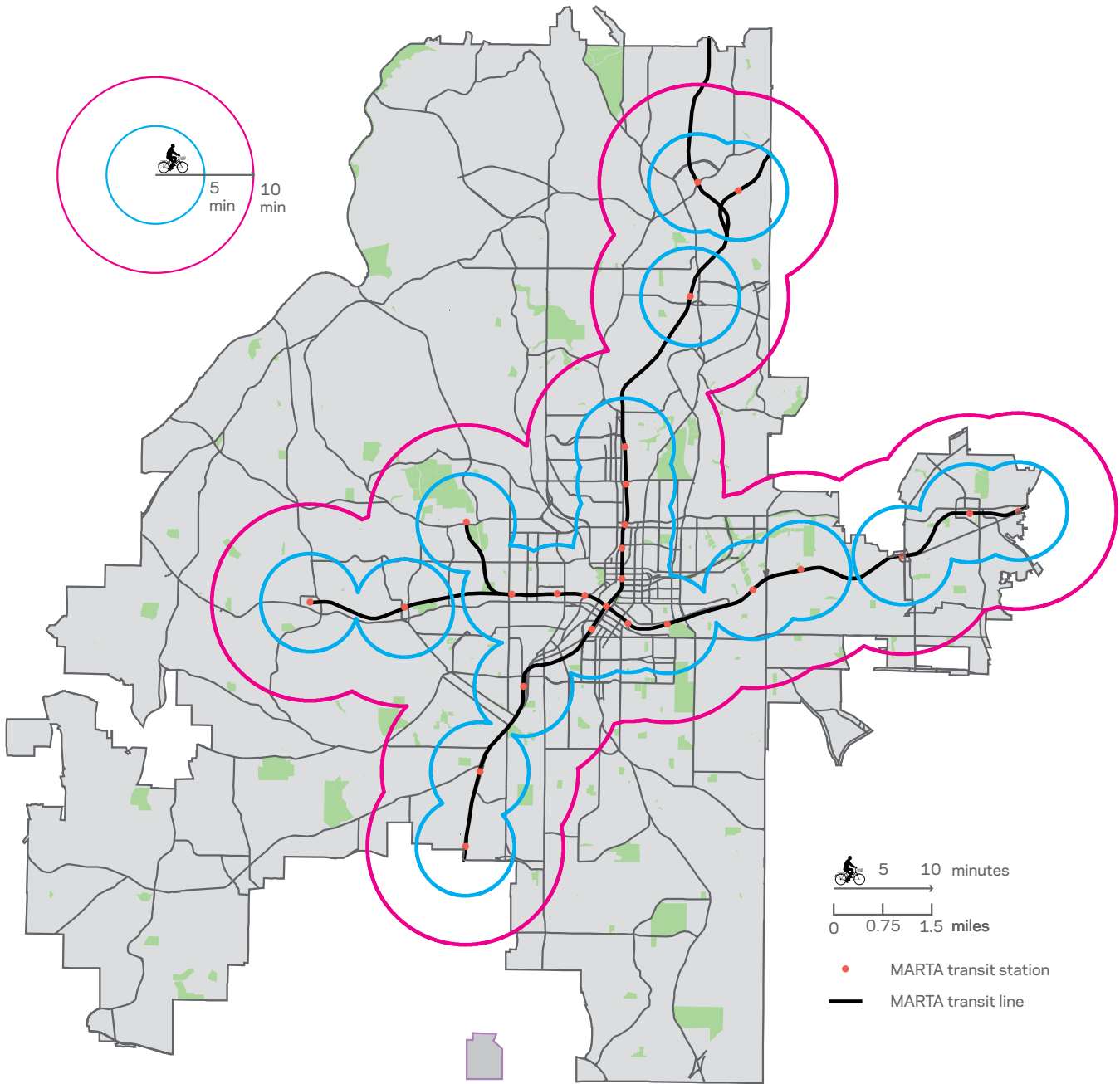
	Total Population	Near Transit Station	% Near Transit Station
5 minute bike ride from transit station (0.75 miles)			
Residents 18-64	309,780	117,090	38%
Employees (2009)	477,749	226,605	47%
10 minute bike ride from transit station (1.5 miles)			
Residents 18-64	309,780	209,215	68%
Employees (2009)	477,749	314,044	66%

Source: U.S. Census 2010

38%
of residents 18-64 in
Atlanta and Decatur live
within a 5 minute bike ride
of a transit station

47%
of employees in Atlanta
and Decatur work within
a 5-minute bike ride of a
transit station

Cycling Proximity to Transit Stations





Bicycles are allowed on MARTA trains and buses, which helps commuters combine biking and public transportation to access daily destinations.

Transit and Bicycling

Biking can be used on either end of a bus or transit trip to reduce travel time to destinations. Currently, MARTA serves Atlanta and Decatur and encourages bicycling in several ways. All MARTA buses are outfitted with bike racks and bikes are allowed on trains, which is not the case with all US transit providers. Additionally, most MARTA stations have bike racks. Given MARTA's investment in bicycle facilities and their adopted policies, there is a commitment to link bicycling to transit.

Regional Mobility

Atlanta and Decatur are both attractive places to work and their increases in daytime population illustrate this desire. According to 2010 American Community Survey, both cities experience significant increases in population during working daytime hours. The Atlanta population increases by 348,130 people during a workday, or 84.2%. Likewise, the Decatur population increase by 17,773 people during a workday, or 93.2%.¹²

Many of the area's jobs are clustered in activity centers where walking and biking are convenient. Additionally, many of the activity centers are served by transit. Even if people do not live in Atlanta, they could potentially benefit from a bike share system, either to finish a portion of their commute or to complete trips during the work day hours.

Barriers to Cycling

For most in Atlanta and Decatur, there are still significant barriers, either perceived or built, that discourage people from riding a bike in the street. If bike share is to be successfully adopted and used by residents, workers and visitors, these barriers will need to be addressed to improve safety, comfort and convenience. The table on the following page is a summary of these conditions.

Residential vs. Daytime Population

	City of Atlanta	City of Decatur
Residential Population	413,462	19,062
Daytime Population	761,592	36,835
Increase	348,130	17,773
% Increase	84.2%	93.2%

Source: American Community Survey 2006-2010 5-Year Estimates

Survey of Barriers to Cycling in Atlanta and Decatur

Arterials



Atlanta and Decatur are very linear in terms of transportation routes, with only a few north-south or east-west options that connect the cities or major destinations. These arterials are attractive for cyclists because of their directness and convenience. However, because of the limited route options, the arterials are also high traffic volume streets. The speeds along these routes, paired with the high motor vehicle volume, make these streets unattractive for most cyclists.

Ponce de Leon Avenue is a prime example of this type of street. It is one of the most direct routes between Atlanta and Decatur, yet with speeds in excess of 35 miles per hour, narrow lanes and no dedicated space for bicyclists, many cyclists have to take alternative routes that are longer and less direct.

It is also worth noting that many of these routes are state-owned, either for their entire length or for segments. If conditions for cyclists are to be improved along these routes, the cities will need to work with the Georgia Department of Transportation to improve safety for cyclists.

Freeways



Freeways are a part of life in Atlanta and Decatur. They move people and goods throughout the region and are a significant source of economic activity. Yet when it comes to bicycling, they can serve as a barrier.

With respect to physical barriers, freeways are grade separated highways that limit where they can be crossed. This limits route options and increases distances between destinations. A key example would be the Downtown Connector that bisects downtown and midtown Atlanta. There are only limited opportunities to cross the freeways, such as at 17th street or 14th street. These limited connections increase travel time and also increase traffic volumes by funneling traffic through specific areas. This increase in traffic volumes, often times combined with no dedicated space for bicycles, makes crossing interstates intimidating and unsafe.

The safety issues associated with interstates is related to two conditions, which include interchanges and areas adjacent to interstates. With interchanges, the issues are associated with high traffic volumes and limited or no dedicated space for bicyclists. For most cyclists, interchanges are a place they do not want to ride. The challenge with areas adjacent to interstates is the opposite of interchanges. Many areas around interstates are in effect dead zones and lack significant activity along the streets, especially during evening hours. These areas can feel unsafe and deter people from riding their bike to certain areas or at certain times of the day.

Street conditions



Poor road conditions can pose safety issues for cyclists as well as motorists. In both cities, potholes, temporary street fixes (metal plates), construction zones, stormwater drains, etc. can create safety hazards. For cyclists, these street conditions can cause crashes or damage bikes.

Additionally, these conditions can force cyclists to merge with vehicles, which can create conflicts and increase the chance of collisions. Improved street conditions through maintenance, construction zone management and infrastructure design can reduce safety hazards for cyclists and drivers alike.

Topography



Atlanta and Decatur are not flat, and in many areas the topography is extremely steep. The cities are located within the Piedmont plateau, which is characterized by rolling hills. While many streets follow ridge lines, which keep grade changes to a minimum, it is impossible to avoid hills in Atlanta. Cyclists adapt to these conditions by picking routes that avoid particularly steep hills. If bike sharing is to be viable, bikes will need to have multiple gears to make climbing hills easier. Conversely, bikes will need to be equipped with good brakes that allow people to safely manage their speed when descending hills.

Rail infrastructure



The Atlanta region was originally developed because of its rail infrastructure, and rail service continues to define development patterns today. While MARTA rail lines connect residents and visitors to area destinations, many of the MARTA rail lines also serve as barriers between neighborhoods. The same holds true for the many active freight rail lines that crisscross through the cities. The rail lines are often grade separated and have similar impacts on adjacent areas as freeways. Activity adjacent to rail lines is often reduced and the limited crossing opportunities increase traffic at crossings. The rail lines increase trip distances by only allowing crossing at specific locations. Designing a bike share system will need to take this reduced connectivity into consideration.

Transportation Costs

To give some perspective on transportation costs, particularly for short trips, the cost of bike sharing was compared to other travel and parking costs. The travel costs are calculated as short, one-way trips. Where distance is a factor in calculating costs, the distance of 1.5 miles is used. This distance roughly equals a 10 minute bike ride at 9 mile per hour. Parking assumes a 1 hour time frame.

By comparison, bike sharing is the most affordable travel option. It is cheaper than taking a car, public transportation, or taxi. If trips are longer, bike sharing becomes even more competitive and cost-effective. Even if a transit trip was combined with bike sharing, it can still be cheaper than driving and having to pay for parking.

Transportation Cost Comparison for Travel and Parking

Travel Mode	Travel	Parking	Total
Bike Share ¹	\$1.40	n/a	\$1.40
Transit Fair ²	\$2.50	n/a	\$2.50
Car Trip ³ w/ On-Street Parking ⁴	\$0.89	\$2.00	\$2.89
Car Trip ³ w/ Off-Street Parking ⁵	\$0.89	\$5.00	\$5.89
Taxi ⁶	\$6.60	n/a	\$6.00

Overall Assumptions

Distance: Where distance is a factor in calculating costs, the distance of 1.5 miles is used. This distance roughly equals a 10 minute bike ride at 9 mile per hour.

Parking Time: Parking assumes a 1 hour time frame.

Notes

1. NiceRide. <https://www.niceridemn.org/subscriptions/>. Accessed June 14, 2012. Based on annual membership of \$60. Cost per day based on annual membership divided by average annual trips by members of 43 trips per year. Assumes all trips are less than 30 minutes, which do not incur additional charges.

2. MARTA. Fares and Passes. <http://www.itsmarta.com/fares-passes.aspx>. Accessed June 14, 2012. Cost for single trip.

3. AAA. Your Driving Costs: 2012 Edition. Based on \$0.596 per mile average. Percent costs include fuel, maintenance, tires, insurance, license, registration and taxes, depreciation, and financing.

4. Park Atlanta. Parking Meters. <http://www.parkatlanta.org/meters.html#6>. Accessed June 14, 2012.

5. Central Parking. <https://find.parking.com/search/?query=atlanta%2C%20ga>. Based on survey of rates for private parking lots and garages in downtown Atlanta.

6. TaxiWiz. Taxi rates for Atlanta. <http://atlanta.taxiwiz.com/fare.php?lang=en>. Accessed June 14, 2012. Based on \$2.50 base fare, \$2.00 per mile, and 20% gratuity.

Equity

Improving mobility and expanding access to city destinations for citizens and visitors is an important component of any public transportation system. This goal is particularly important for those with less access to resources or income to pay for transportation.

Low income and minority populations, as well as the elderly, children and people with disabilities have often been disproportionately impacted by harmful human health or environmental effects of government activities, such as transportation projects like interstates. Some of the impacts have included air pollution, noise, safety issues, hazardous materials, limited access to jobs, services and other opportunities, deflated property values, business and/or home displacement, or disproportionate costs of transportation.

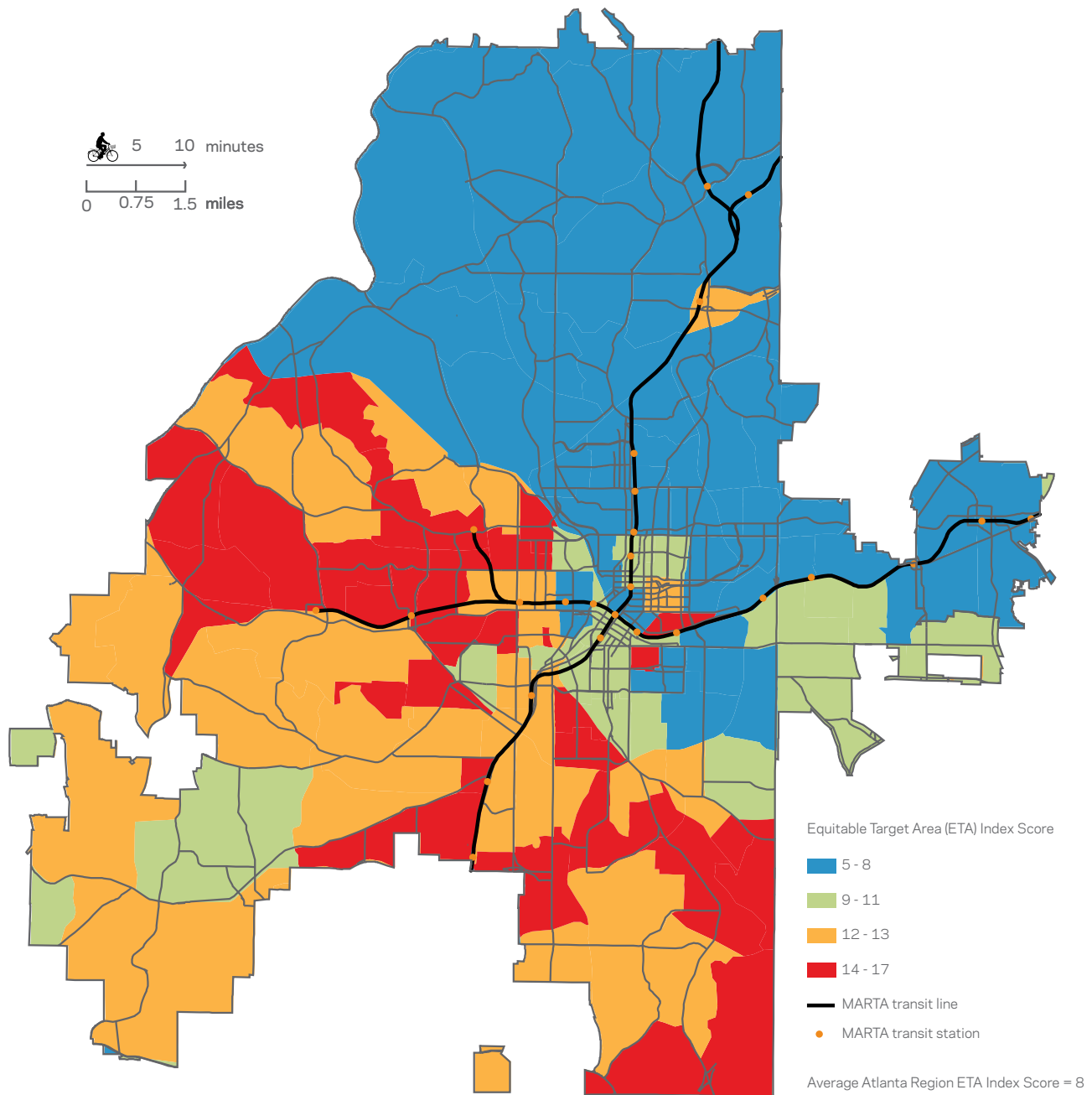
To help inform decisions about environmental justice, equity, transportation investments and other government decision-making in the Atlanta region, the Atlanta Regional Commission developed the Equitable Target Area (ETA) Index. Using data from the American Community Survey (ACS) 3-year estimates (2005-2009), the index uses five demographic and socioeconomic factors to develop the index. They include:

- Age - % of the senior population 65 years old and over,
- Education attainment - % of the population over 25 years old with no high school degree,
- Median housing values,
- Poverty - % of the population below the federal poverty line; poverty thresholds were calculated by the ACS based on household type and size,
- Minorities -% of the non-white population

The map on the following page highlights the distribution of ETA index scoring within Atlanta and Decatur. For the Atlanta region, the lowest score is 5 and the highest score is 17. The average score is 8. Areas with higher scores have greater need for attention, investment and services because of the more vulnerable populations that live or work in the areas.

Almost all of Decatur scores at or below the regional average. The north and east portions of Atlanta score similarly. Areas in the south and west score higher on the index, which means these areas have a greater need for affordable transportation options and access to public transportation.

Equitable Target Areas (ETA) Index



References

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2. Atlanta Bicycle Coalition. 2010. Bike Count Report 2010.
3. Alliance for Bicycling and Walking. Bicycling and Walking in the United States: 2012 Benchmarking Report. 2012. Pg. 45
4. Alliance for Bicycling and Walking. Bicycling and Walking in the United States: 2012 Benchmarking Report. 2012. Pg. 45
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6. Centers for Disease Control and Prevention, Communities Putting Prevention to Work, 2012. http://www.cdc.gov/CommunitiesPuttingPreventiontoWork/resources/physical_activity.htm#guidelines
7. Clean Air Campaign. Health Advisory: Outdoor Physical Activity and Smog. http://www.cleanaircampaign.org/content/download/2737/20367/file/HealthAdvisoryCombined_final.pdf Accessed June 20, 2012.
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9. American Community Survey 2010 (1-Year Estimate).
10. Geller, R. Four Types of Cyclists. Portland Office of Transportation. <http://www.portlandonline.com/transportation/index.cfm?a=237507&c=44671> Accessed June 15, 2012. Pg. 1
11. American Public Transportation Association. August 14, 2012. Transit Ridership Report: Second Quarter 2012.
12. American Community Survey 2006-2010 (5-Year Average). Daytime population is calculated by adding the total residential population to the total workers in an area, and then subtracting the total workers living in an area.

Suitability and Demand Analysis

Where will bike share work best in Atlanta and Decatur?

While there are common trends associated with bike sharing systems around the country, each system is also influenced by local conditions and factors. The suitability analysis for this study was used to identify where in Atlanta and Decatur bike sharing is best suited.

The suitability analysis identifies where in Atlanta and Decatur bike sharing could likely be the most successful in terms of service area and demand. The results helped identify and develop phase 1 service areas, or areas that are best to start bike share service.

Once the phase 1 service areas were identified, the demand for bike sharing within these service areas was analyzed. The results from the demand analysis are instructive and allow for comparison with peer cities and systems. They are also used to develop the financial models presented in the Paying for Bike Share chapter.



Bike Share Suitability

The suitability analysis was developed to address the following questions:

- What are the community factors that can positively support a bike share program?
- Based on these community factors, where would a bike share system in Atlanta and Decatur be most feasible?

The sections that follow describe the community factors used to analyze bike share suitability, the methodology used to develop the analysis, the findings of the analysis and the priority service areas identified for bike share implementation.

Community Factors

Data for this analysis was selected based on three categories that include:

- Trip Origin Factors
- Trip Destination Factors
- Transportation Network Factors

The data is summarized below and includes summary information, why the data was selected, source information, raster analysis assumptions and weight factor for composite analysis.

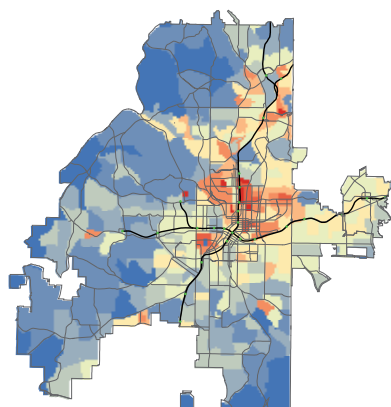
Trip Origin Factors

Residential Population Density for persons 18-64 years of age

Population density has been shown to influence travel patterns. As population density increases, the use of vehicles decreases and alternative transportation modes (walking, biking and public transportation) increases.¹ Because of this factor, increased population density is given a higher score and lower population density a lower score.

- **Data Source:** U.S. Census 2010
- **Raster Analysis Assumptions:** Gradient analysis; Reclassified to 1 to 10 scale by natural breaks; density per square mile
- **Weight Factor for Composite Analysis:** x1.5

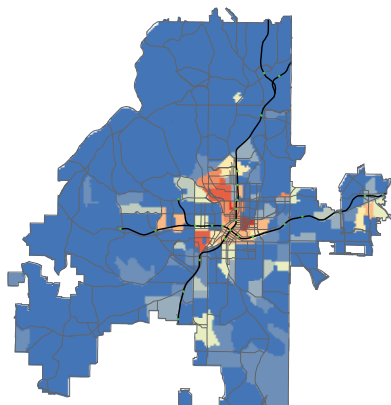
Residential Population for persons 18-64 years of age



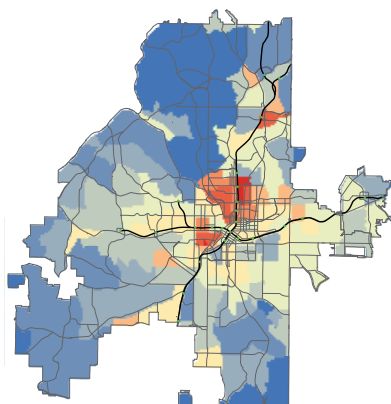
Data Factors for Bike Share Composite Analysis

Factor	Source	Geography	Analysis Assumptions	Weight for Composite Score Mapping
Trip Origin Factors				
Residential Population Density for persons 18-64 years of age	US Census 2010	Census Block	Gradient analysis; Reclassified to 1 to 10 scale by natural breaks; density per square mile	x1.5
Non-Institutionalized Group Quarter Population Density (University Housing)	US Census 2010	Census Block	Gradient analysis; reclassified to 1 to 10 scale by natural breaks; density per square mile	0.5x; Factor reduced since population is already captured with residential population density
Alternative Commuters (% of alternative commuters)	American Community Survey 2009	Census Tract	Gradient analysis; reclassified to 1 to 10 scale by natural breaks; density per square mile	x1
Hotel Density	Atlanta Convention and Visitor's Bureau	Block Group	Hotel room density per square mile	x1
Trip Destination Factors				
Employment Density	Atlanta Regional Commission	Census Tract	Gradient analysis; reclassified to 1 to 10 scale by natural breaks; job density per square mile	x1.5
Retail/Entertainment Employment	Atlanta Regional Commission	Census Tract	Gradient analysis; reclassified to 1 to 10 scale by natural breaks; job density per square mile	x1
Tourist and Entertainment Destinations	Atlanta Convention and Visitors Bureau	Points	Proximity analysis; reclassified to 1 to 10 scale by natural breaks; 1,000 meter buffer	x1
Parks and Recreation	Atlanta Regional Commission, City of Atlanta, City of Decatur, BeltLine, Inc.	Park Boundaries	Proximity analysis; reclassified to 1 to 10 scale by natural breaks; 1,000 meter buffer	x0.5
Transportation Network Factors				
Dedicated Bicycle Facilities (Bike lanes and multi-use paths)	Atlanta Regional Commission, City of Atlanta, City of Decatur, BeltLine, Atlanta Bicycle Coalition	Lines	Proximity analysis; reclassified to 1 to 10 scale by natural breaks; 1,000 meter buffer	x1
Shared Lane Bicycle Facilities (Bike Routes and Sharrows)	Atlanta Regional Commission, City of Atlanta, City of Decatur, BeltLine, Atlanta Bicycle Coalition	Lines	Proximity analysis; reclassified to 1 to 10 scale by natural breaks; 1,000 meter buffer	x.05
Topography	ARC, USGS	30 meter grid	Gradient analysis; reclassified to 1 to 10 scale by natural breaks; 0-5% slope	x1
Transit Stations	Atlanta Regional Commission	Points	Proximity analysis; reclassified to 1 to 10 scale by natural breaks; 1,000 meter buffer	x1.5
Bus Stops	Atlanta Regional Commission; Georgia State University; Georgia Tech; SCAD; Atlantic Station Access + Mobility Program; Buckhead Area TMA; street car	Points	Proximity analysis; reclassified to 1 to 10 scale by natural breaks; 1,000 meter buffer	x0.5
Employment Services Organizations (ESO)	Atlanta Regional Commission	Organization Boundaries	Proximity analysis; yes/no classification, with score of 10 applied to areas that have an ESO and 1 for areas that do not have an ESO.	x1

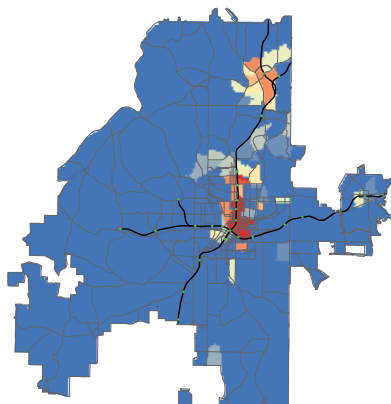
Group Quarters



Alternative Commuters



Hotel Density



Non-Institutionalized Group Quarter Population Density (University Housing)

Students living in university housing are also captured with general residential population density. However, they are included as an additional weighted factor because they are a likely market for bike sharing. Students generally fit the user profile for bike share users and they depend heavily on public transportation, either on campus or to get to campus.²

Additionally, the institutions are committed to transportation management services to help students access campus. Georgia Institute of Technology, Georgia State University and Savannah College of Art and Design all operate their own shuttle service to compliment the MARTA transit services near campus. The institutions have programs that support alternative commute options, and bike sharing would be a likely compliment to these services. Georgia Tech is already testing this idea with their implementation of a pilot bike share program.³

Finally, since dorms and student housing are often located either on campus or nearby in urban settings, they are a likely user group for a bike share program.

- **Data Source:** U.S. Census 2010
- **Raster Analysis Assumptions:** Gradient analysis; reclassified to 1 to 10 scale by natural breaks; density per square mile
- **Weight Factor for Composite Analysis:** x0.5; factor reduced since population is already captured with residential population density.

Alternative Commuters (% of alternative commuters)

Alternative commuter data describes how people travel to work and does not describe how people travel for leisure or other non-work trips. The data is from the 2009 American Community Survey and describes people who use public transportation, bike or walk to travel to work. It is also worth noting that the data set represents workers 16 years of age and over.⁴ These groups represent potential users for a bike system, since a bike share system compliments these modes of travel.

- **Data Source:** American Community Survey 2009
- **Raster Analysis Assumptions:** Gradient analysis; reclassified to 1 to 10 scale by natural breaks; density per square mile
- **Weighted Factor for Composite Analysis:** x1

Hotel Density

Hotels are a significant source of tourist and visitor traffic in Atlanta and Decatur. Whether visiting for work, vacation or other reasons, visitors need convenient transportation options. Additionally, many visitors walk, use public transportation or take taxis to visit area destinations.

As has been the case with other bike share systems, such as Capital BikeShare in Washington DC, visitors and temporary users represent a significant number of the system's trips. They can also provide a significant share of the revenue from fees.⁵ Additionally, for casual users (non-annual membership users), tourist destinations and sightseeing are a primary reason for using bike share. One survey of Capital Bikeshare casual users found that 53% of those surveyed were using the system to travel to tourist destinations or sightsee.⁶ Given the importance of casual users and tourism with other systems, this study has included hotel density data to identify areas favorable for visitor use.

- **Data Source:** Metro Atlanta Chamber of Commerce
- **Raster Analysis Assumptions:** Room density at block group level; density per square mile
- **Weighted Factor for Composite Analysis:** x1

Trip Destinations

Employment Density

Identifying where people work is important for this study for two reasons. One, travel to and from work is a significant source of traffic in Atlanta. Second, midday trips are a significant source of traffic during day-time hours. Providing people with an opportunity to ride a bike to or from work (for either all or a portion of their commute) can help reduce traffic congestion. Additionally, bike sharing can provide an alternative for short daytime trips, especially in higher density areas where destinations are close by and parking can be inconvenient.

Research has shown that employment density is a significant factor in the commute mode of transportation chosen. In fact, one study found that job density had a greater impact on commute mode choice than residential density. As job density increases, particularly over 75 employees per acre, use of a single occupancy vehicle decreases and transit ridership and walking increases.⁷ These facts highlight the idea that as density increases, alternative modes of transportation, such as walking and public transportation, become more convenient because of efficiencies with transportation infrastructure.

- **Data Source:** Atlanta Regional Commission
- **Raster Analysis Assumptions:** Gradient analysis; reclassified to 1 to 10 scale by natural breaks; jobs per square mile
- **Weighted Factor for Composite Analysis:** x1.5

Retail/Entertainment Employment

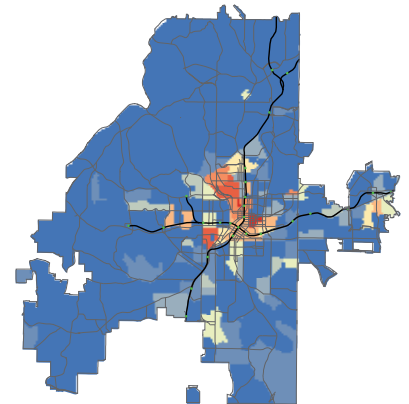
Retail and entertainment employment is a significant generator of non-work related trips, and density of retail and entertainment employment also has a significant impact on how people access these destinations. Additionally, retail employment density is an indicator of the degree of mixed uses. When many uses are located in close proximity, the walking, biking and public transit use increases and driving decreases.

For the analysis, the number of jobs per square mile was used instead of the number of businesses or the total square footage for a particular area. Research has shown that both of these measures can skew results by providing greater weight to lower intensity uses. The number of jobs provides a more accurate measure for the intensity of retail use.⁸

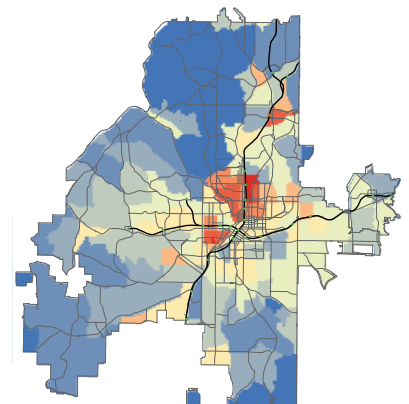
It should also be noted that retail and entertainment jobs are a subset of the total job density data set. Because retail and entertainment businesses generate leisure trips from patrons in addition to employees, it has been selected as an important variable to include in the analysis. And because of retail's strong influence, it has been assigned a weighted factor of 1 rather than a reduced weighted score.

- **Data Source:** Atlanta Regional Commission
- **Raster Analysis Assumptions:** Gradient analysis; reclassified to 1 to 10 scale by natural breaks; jobs per square mile
- **Weighted Factor for Composite Analysis:** x1

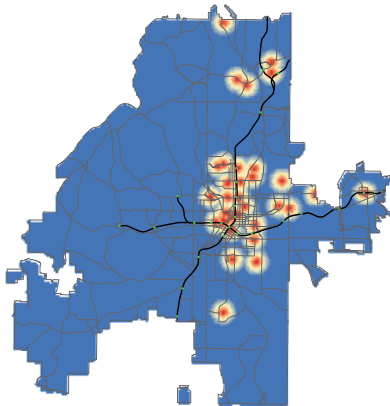
Employment Density



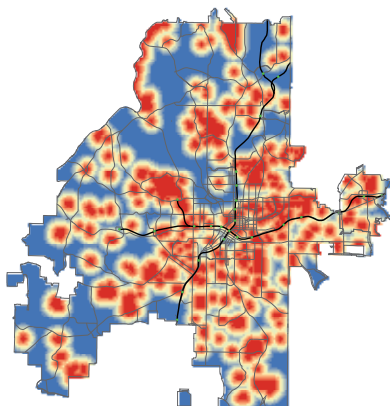
Retail/Entertainment Employment



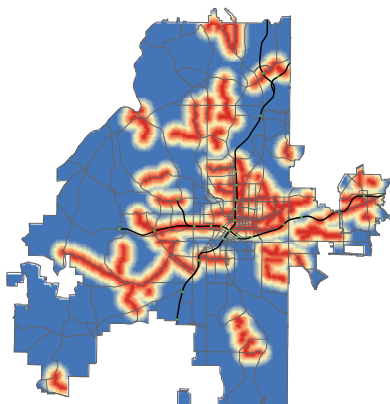
Tourist and Entertainment Destinations



Parks and Recreation



Dedicated Bicycle Facilities



Tourist and Entertainment Destinations

Tourism and entertainment destinations are a significant source of economic activity in Atlanta and Decatur. Additionally, these same places are popular destinations for residents and visitors.

For tourists, accessing important tourist destinations is a significant reason for using bike share. A survey of casual users of the Capital BikeShare system in Washington DC found that 53% of casual user trips were for “tourism/sight seeing” as the reason for using bike share.⁹ Additionally, a member survey of Capital BikeShare members found that the number one trip purpose was for social/entertainment purposes.¹⁰ Because tourism and social activities have been shown to be a primary trip purpose for bike share users, this category has been included as an important community factor influencing bike share usage.

- **Data Source:** Metro Atlanta Chamber of Commerce; City of Atlanta; City of Decatur
- **Raster Analysis Assumptions:** Destination density at block group level; destinations per square mile
- **Weighted Factor for Composite Analysis:** x1

Parks and Recreation

Parks are safe areas where people often ride bikes for recreation. People also ride their bikes to parks for convenience, as parking is often in short supply within or adjacent to parks.

While recreational use is a reason people have chosen to use other bike share systems, it is not the primary reason. A study of casual users of the Capital Bikeshare notes that only 15% of those casual users surveyed used the system for recreation.¹¹ Combined with the fact that many of Atlanta and Decatur parks are located in lower density areas, parks were given a lower weighted score for the composite analysis.

- **Data Source:** Atlanta Regional Commission, City of Atlanta, City of Decatur, BeltLine, Inc.
- **Raster Analysis Assumptions:** Proximity analysis; 10 quartile classification method; 1000 meter buffer
- **Weighted Factor for Composite Analysis:** x.05

Transportation Network Factors

Dedicated Bicycle Facilities

Dedicated space for bicycles is a critical component for increasing cycling ridership and safety. Research has found that infrastructure, such as bike lanes, separated bike lanes, and bike paths, can positively support bicycle ridership.¹² Additionally, bike lanes and bike paths increase the perception of safety for those bicycling, which in turn increases the likelihood someone will chose to ride.¹³ For the purpose of this study, streets with bike lanes or areas with bike paths were used to represent bicycle facilities.

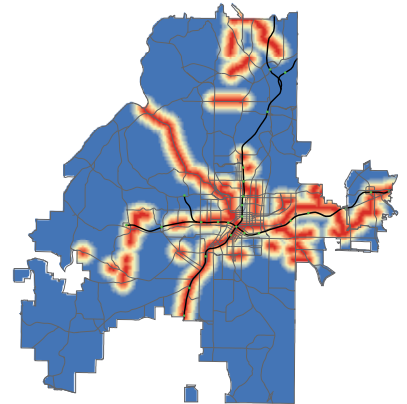
- **Data Source:** Atlanta Regional Commission, City of Atlanta, City of Decatur, BeltLine, Atlanta Bicycle Coalition
- **Raster Analysis Assumptions:** Proximity analysis; Reclassified to 1 to 10 scale by natural breaks; 1,000 meter buffer
- **Weighted Factor for Composite Analysis:** x1

Shared Lane Bicycle Facilities

For this analysis, shared lane bicycle facilities are defined as those streets designated as bike routes or that have shared-lane markings, such as sharrows. Often times these routes are streets that are supportive of bicycling because of their lower traffic volumes or because they are designated as bike routes by the state DOT or local jurisdiction. Because dedicated bicycle facilities have a greater influence over rider comfort and safety, streets without dedicated bike lanes but designated as shared lane facilities have been given a lower weighted factor. This is done to give preference to areas with dedicated bicycle infrastructure.

- **Data Source:** Atlanta Regional Commission, City of Atlanta, City of Decatur, Atlanta Bicycle Coalition
- **Raster Analysis Assumptions:** Proximity analysis; Reclassified to 1 to 10 scale by natural breaks; 1,000 meter buffer
- **Weighted Factor for Composite Analysis:** x0.5

Shared Lane Bicycle Facilities



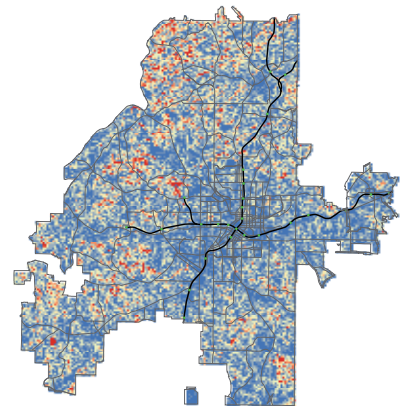
Topography

How hilly an area is has an impact on where and whether people ride bikes. Areas with more gentle grades are more ideal for bike sharing, especially considering the fact that bike share bikes often have limited gears and are quite heavy when compared to many typical bikes.¹³

What is less well known is the degree to which slope impacts route selection and willingness to ride a bike. For the purpose of this analysis, 5% or greater slope was identified as most severe and less than 1% slope as most ideal.

- **Data Source:** Atlanta Regional Commission
- **Raster Analysis Assumptions:** Gradient analysis from low to high; 10 quartile classification method; 0-10% slope
- **Weighted Factor for Composite Analysis:** x1

Topography



Transit Stations

Bike sharing offers many positive benefits when paired with transit service because transit trips are inherently dependent on multiple modes of travel. At a minimum, transit trips either begin or end with walking. Any improved efficiency in accessing transit or finishing a transit trip can help enhance the convenience of service.

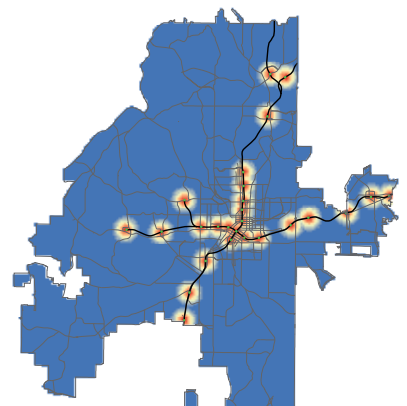
Some of the benefits include first or last mile connectivity, enhanced transfers and improved service during off-peak hours. Bike sharing systems enhance these ends to transit trips by providing an on-demand transportation option.

Additionally, biking to or from a station can either increase the distance someone can travel to or from a station, or it can reduce the time it takes to walk to or from a station. Likewise, bike sharing can also enhance transit efficiency by improving connections between transit stations and bus service and supplementing transit service during off-peak hours.¹⁴

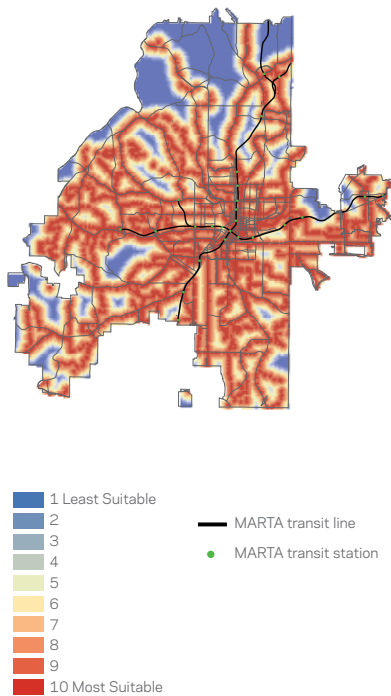
Because bike sharing has been shown to have such a strong link to transit, it has been given a weighted factor of 1.5 for the composite analysis.

- **Data Source:** Atlanta Regional Commission
- **Raster Analysis Assumptions:** Proximity analysis; reclassified to 1 to 10 scale by natural breaks; 1,000 meter buffer
- **Weighted Factor for Composite Analysis:** x1.5

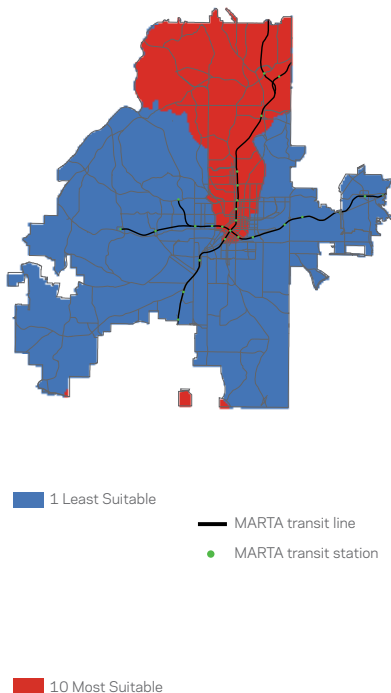
Transit Stations



Bus Stops



Employment Service Organizations



Bus Stops

Integrating bike sharing with bus stop service is important for many of the same reasons as its integration with heavy rail service. Additionally, bike sharing can improve bus service perception and travel options associated with transit.

Research has shown that wait times between buses or during transfers is perceived to be two to three times longer than actual time. Any reduction in perceived wait times will help attract riders. The improved perception can attract new riders to bus service by increasing travel options at the beginning or end of a trip, as well as reduce the perception of inconvenience. Likewise, existing transit users may be encouraged to continue using service if the convenience of bus travel is enhanced with additional travel options.¹⁵

For this analysis, bus stops include MARTA, the Atlanta Streetcar, commuter bus services including Georgia Regional Transportation Authority, Gwinnett County Transit, and Cobb Community Transit, as well as local shuttles that include Georgia Institute of Technology, Georgia State University, Atlantic Station, and the Buc.

- **Data Source:** Atlanta Regional Commission; Georgia State University; Georgia Institute of Technology; Atlantic Station Access + Mobility Program; Buckhead Area TMA; Atlanta Street Car
- **Raster Analysis Assumptions:** Proximity analysis; reclassified to 1 to 10 scale by natural breaks; 1,000 meter buffer
- **Weighted Factor for Composite Analysis:** x0.5

Employment Service Organizations (ESO)

Employment Service Organizations are organizations that work with area employers to help establish and operate commute option programs for their employees. ESOs are part of a larger regional strategy called Transportation Demand Management, which is focused on reducing traffic congestion and air pollution by eliminating single occupancy vehicle trips and/or decreasing the length of SOV trips. For the Atlanta region, the Atlanta Regional Commission's TDM division provides financial and coordination support for area ESOs.¹⁶

Related to bike sharing, ESOs offer the institutional capacity and financial incentives to encourage people to use bike sharing. Within the boundaries for this study, only the City of Atlanta has ESOs which include Buckhead Area TMA, Atlanta Station Access + Mobility Program, the Downtown Transportation Management Association and Midtown Transportation Solutions.

For the analysis, areas were classified as either within an ESO or not. Areas within an ESO were assigned a value of 10 and areas outside of ESOs were given a score of 0.

- **Data Source:** Atlanta Regional Commission
- **Raster Analysis Assumptions:** Proximity analysis; yes/no classification, with score of 10 applied to areas that have an ESO and 1 for areas that do not have an ESO.
- **Weighted Factor for Composite Analysis:** x1

Methodology

The suitability analysis layers demographic, development, market and infrastructure factors on top of each other to create a composite score for bike share suitability. The factors were analyzed geographically to identify market areas most favorable for supporting a bike share system.

For this study, a geographic information system (GIS) composite analysis known as a weighted-sum raster analysis was used. The weighted sum analysis allows local conditions to define the best areas for bike sharing and is well suited to define geographic service areas.

The workflow for this method included the following steps:

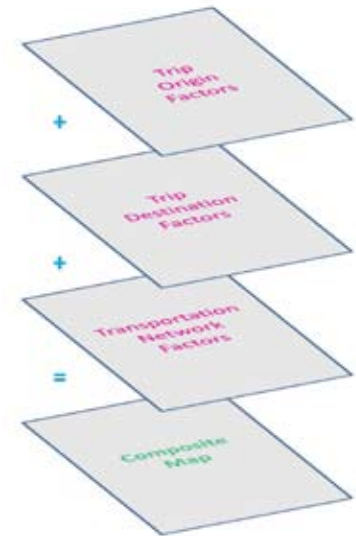
- 14 GIS datasets were selected and assigned high to low values based on density or proximity. The data sets were selected based on best practices identified during a literature review.
- To create a consistent comparison between variables, each raster data set was converted into a citywide grid of 10-meter cells, with each cell being assigned a value from low to high.
- Once the values were assigned to each cell, they were reclassified into ten numerical bins using the natural breaks method of classification, which is a method of minimizing variance within each category. After the values were grouped, each was reclassified and assigned values using a 10 point scale. A value of 10 was assigned to a classification, or bin, determined to be most favorable. 1 was assigned to the least favorable value. This process was completed for each of the 14 GIS data sets.
- The 14 layers were then aggregated using a weighted sum to calculate a composite bike suitability score. As part of the calculation, each factor was assigned a weight to identify how heavily the scores were weighted. Additionally, certain factors were intentionally double counted by virtue of there being subsets of other layers. This was done to highlight factors that are particularly favorable for generating bike share usage.
- After the raw composite scores were calculated, the values were again regrouped into ten categories using natural breaks. The outcome of this reclassification is a composite score that is used to identify the areas most favorable for bike sharing.

To identify the primary, or core, market area, the results were observed and an outline was drawn around largest generally contiguous group of areas with the highest score category. Once the core area was identified, the boundaries were smoothed and snapped to logical boundaries, such as major streets or neighborhood edges. Additionally, these areas were selected based on proximity to transit, recreation destinations and neighborhood commercial centers. The same approach was used to identify the secondary, or periphery, market areas for later system expansion.

Because of Atlanta's polycentric and linear development patterns, the core and secondary areas were adjusted to accommodate these unique geographic conditions. Given these unique conditions, it is recommended that Atlanta and Decatur take a two-component approach to implementation.

Clearly there is a core area that is most favorable for bike share. This area should be the primary focus for the first phase of a bike share program. In conjunction with this phase, several of the outlying areas could be used as pilot programs to test their suitability for bike sharing. Examples of these areas could include sections of the BeltLine and PATH multi-use paths that are outside the primary service areas but within the secondary market areas.

GIS Composite Analysis Process



1 in 4

Residents in Atlanta and Decatur age 18-64 live within the phase 1 service areas.

1 in 2

Employees in Atlanta and Decatur work within the phase 1 service areas.

Findings

Based on the suitability analysis, two types of market areas were identified: primary and secondary market service areas. The primary market service area, or phase 1 service areas, are the areas best suited to launch a bike share system in the short term. For the purpose of this study, short term is being defined as 0-5 years.

Within the primary market service area, there is sufficient density, market demand and existing infrastructure to launch a bike share system. In total, the phase 1 service areas cover 14.1 square miles, or 15% of the Atlanta and Decatur study area.

The secondary market service area is the area that has potential to support a bike share system but does not yet have development density, destination density or infrastructure in place to support a bike share system. For these areas, bike share is seen as a long term, or 5+years, focus. Expanding into the secondary market service areas will depend on the success of first phase of bike sharing and the development and investment that occurs over the next 5 years.

Areas along many sections of the BeltLine are a great example of this condition. The policies are in place to encourage walkable, bikeable and transit-oriented development. However, many of these developments are not likely to be built out within the next 5 years.

The primary market service areas represent three dis-contiguous service areas and cover 14.1 square miles. The three service areas cover the core of Buckhead, the core of Atlanta (Midtown, Downtown and neighborhoods immediately adjacent to these districts) and the core of Decatur.

In terms of geographic coverage, the phase 1 market service areas cover 15% of the area of Atlanta and Decatur. The Central Atlanta service area covers the greatest area with 10.7 square miles, followed by Buckhead with 2.9 square miles and Decatur with just 0.6 square miles.

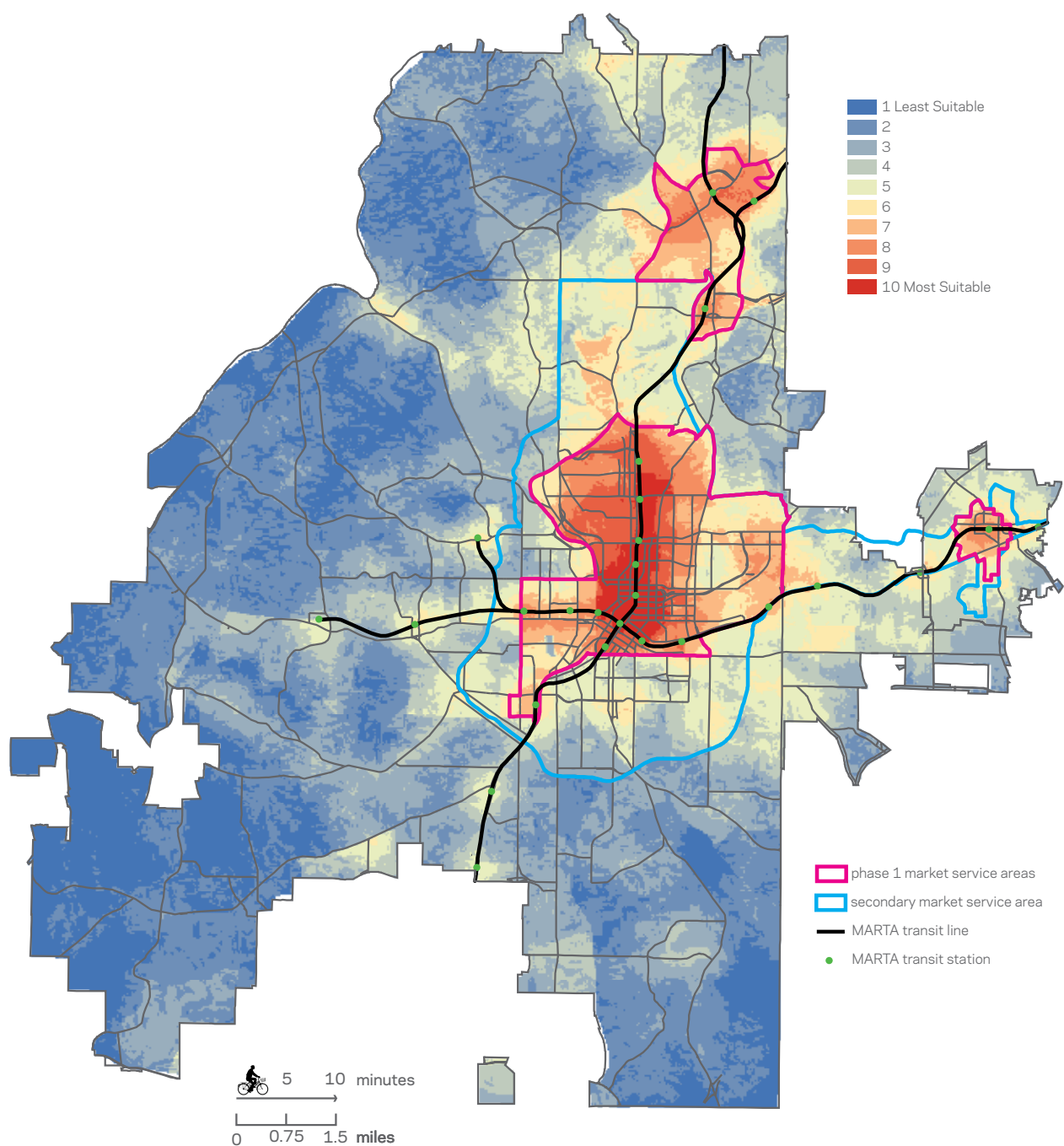
In terms of population, 88,958 residents 18-64 live within the three service areas. Said another way, 28.7% of the population 18-64 in Atlanta and Decatur live within the phase 1 service areas. That means roughly 1 in 4 residents in Atlanta and Decatur between the ages 18-64 will have access to bike sharing where they live.

When looking at employment within the phase 1 service areas, 223,955 people, or 46.9% of the employees in Atlanta and Decatur, work within the service areas. This fact means that roughly 1 in 2 employees will have access to bike sharing where they work.

Phase 1 Market Service Area Summary

Atlanta+Decatur		94.4		309,780		477,749	
Service Area	Area (sq mi)	% of study area (Atlanta+Decatur)	Population 18-64 (2010)	% of population 18-64 w/ in Atlanta + Decatur	Employees (2009)	% of employees w/in Atlanta + Decatur	
Central Atlanta	10.7	11.4%	72,962	23.6%	192,794	40.4%	
Buckhead	2.8	3.0%	13,869	4.5%	29,228	6.1%	
Decatur	0.6	0.6%	2,127	0.7%	1,833	0.4%	
Total	14.1	15.0%	88,958	28.7%	223,855	46.9%	

Bike Share Suitability in Atlanta and Decatur



Bike Share Demand

The bike share demand analysis was developed to address the following questions:

- How many people could potentially use a bike share system in Atlanta and Decatur within the defined phase 1 service areas?
- Based on the estimated user demand for bike sharing in Atlanta and Decatur, how many bikes and stations are needed?
- Based on the estimated user demand for bike sharing in Atlanta and Decatur, how many trips could be generated?

The sections that follow describe the methodology used to develop the analysis, factors used to estimate bike share demand, and the findings of the analysis. Additionally, for more background details about the methodology used to estimate demand, please see the appendix.

Methodology

This study builds on the demand model developed for the Minneapolis NiceRide system. The NiceRide system and its model are selected because of the data available and because Minneapolis-St. Paul has many of the same community features in terms of geographic size, political boundaries, population size and transportation system.

Additionally NiceRide is one of the more mature systems in the US. It can provide more robust performance metrics because it has been in operation for several years and because of its system size (number of bikes, stations, etc.).

In addition to using the methods from the Minneapolis study for this study, 2011 performance metrics from the NiceRide system are used to generate the demand estimates for users, trips and bikes.

The results from the demand analysis are used to develop the financial analysis found in the Paying for Bike Share chapter of this study. The methodology for this study uses a three step process to calculate the demand data needed for the financial analysis. These steps include:

- Calculate the number of users
- Estimate the number of bikes and bike stations based on the proposed service area size.
- Estimate the number of trips based on the estimated number of users

Demand Factors

The demand factors used for this analysis address the demand information needed to calculate financial performance. Demand factors include the following:

- **Membership and Casual Users** - Estimated membership based on membership rates for residential population, employee population, student population and casual user estimates.
- **Bikes and Bike Stations** - Estimated bikes and stations based on bike station density and the ratio of bikes per station.
- **Trip Generation** - Estimated annual trips based on annual members and casual users.

The table below provides a summary of the demand factors, analysis assumptions and the equations used to calculate demand metrics. The demand factors and the assumptions used for this analysis are also explained and discussed on the following page.

Demand Estimate Assumptions and Methodology

Metric	Assumptions	Calculation
Membership and Casual Users ¹		
Annual Residential Membership Rate	Membership rate @ 1.2% Total Population 18-64 within Phase 1 Service Areas	Resident Membership Rate = Total Population 18-64 within Phase 1 Service Areas x 1.2%
Annual Worker Membership Rate	Membership rate @ 0.7% Total Workers within Phase 1 Service Areas	Employee Membership Rate = Total Workers within Phase 1 Service Areas x 0.7%
Annual Student Membership Rate	Membership rate @ 1.2% Total Students within Phase 1 Service Areas	Student Membership Rate = Total Students within Phase 1 Service Areas x 1.2%
Total Annual Membership Rate	N/A	Total Annual Membership Rate = Resident Membership Rate + Employee Membership Rate + Student Membership Rate
Casual User Rate	Annual Casual User Rate = 30,000 people	
Bikes and Bike Stations ²		
Bike Stations Needed	4 stations per square mile Total Service Area (square miles) for Phase 1 Service Areas	Bike Stations Needed = Total Service Area (square miles) for Phase 1 Service Areas x 4
Bikes Needed	Goal of 10 bikes per station	Bike Stations Needed = Bikes Needed x 10
Trip Generation ³		
Annual Members	Average of 43 trips per year	Total Annual Trips by Annual Members = Annual Members x Average Trips Per Year (43)
Casual Users	Average of 2.5 trips per day	Total Annual Trips by Casual Users = Annual Number of Casual Users x Trips Per Day (2.5)
Total Trips	N/A	Total Annual Trips = Total Annual Trips by Annual Members + Total Annual Trips by Casual Users

Notes

1. Rates developed based on adjusted annual subscription rates from NiceRide Feasibility study. The rates were adjusted based on actual membership in 2011 and phone interview with NiceRide operations management; Annual casual users were adjusted to 30,000 based on NiceRide casual user data from 2011.
2. Based on NiceRide system metrics for calendar year 2011.
3. Based on NiceRide system metrics for calendar year 2011.

Membership and Casual Users

The estimated number of users is generated from information for the phase 1 service areas identified in the community suitability analysis. The two main categories of users are annual members and casual users.

Annual members are estimated by calculating the number of potential user groups within a market service area and then multiplying the user groups by an estimated membership rate. For annual members, the three user groups include residents, workers and student populations.

The membership rates for this study are based on estimated membership rates used for the NiceRide system.. The rates applied for this study include 1.2% membership rate for residents, 0.7% membership rate for workers and a 1.2% membership rate for students. The Membership Rate Development table below summarizes how the rates are developed.

Annual casual user rates are also estimated based on the annual casual user data available for NiceRide. The annual casual user rate used for this study is 30,000. The Annual Casual User Rate Development table below summarizes how this rate is developed.

Membership Rate Development: Nice Ride Data

Rate Type ¹	Population Estimate	Projected Annual Rate	Projected Membership
Residents	100,000	5.0%	5,000
Workers	200,000	3.0%	6,000
Students	50,000	7.0%	3,500
Total	300,000		14,500
2011 Nice Ride Annual Membership ²			3,497
Adjustment Ratio (2011 Nice Ride Membership Rate divided by Estimated Annual Membership From Nice Ride Feasibility Study)			24%

Notes

1. Membership rates for residents, workers and students from 2008 Nice Ride Feasibility Study
2. Based on actual Nice Ride annual membership rate in 2011.

Adjusted Membership Rates for Atlanta and Decatur by Rate Type¹

Rate Type	Annual Rate
Residents	1.2%
Workers	0.7%
Students ²	1.2%

Note

1. Nice Ride Projected Annual Rate x 24%
2. Projected annual rate for students is adjusted down to 5.0% to calculate adjusted student rate. This adjustment is used to create a conservative estimate and is based on Nice Ride data that suggests students were less likely to use system than originally expected.

Casual User Yearly Rate Development ^{1,2}

Rate Type	Rate
Nice Ride Estimated Annual Casual Users	52,000
Nice Ride 2011 Annual Casual Users	28,726
Atlanta and Decatur Adjusted Annual Casual User Rate ³	30,000

Notes

1. Casual user estimate is from 2008 Nice Ride Feasibility Study.
2. Information was provided by Nice Ride.
3. The annual casual user rate is adjusted up slightly to a round number that is easy to calculate and to accommodate expected tourists use in Atlanta and Decatur.

Below are the summary equations used to calculate user demand.

- Resident Membership Rate = Total Population 18-64 within Phase 1 Service Area x 1.2%
- Worker Membership Rate = Total Workers within Phase 1 Service Area x 0.7%
- Student Membership Rate = Total Students within Phase 1 Service Area x 1.2%
- Total Annual Membership Rate = Resident Membership Rate + Worker Membership Rate + Student Membership Rate

Bikes and Bike Stations

The number of bike stations needed for the phase 1 service areas is based on station density, or the number of stations per square mile. The NiceRide system currently operates with a station density of 4 stations per square mile. Below is the equation used to calculate the estimated number of bike stations for the phase 1 service areas.

- Bike Stations Needed = Total service area (square miles) for phase 1 service area x 4

The number of bikes needed for the phase 1 service areas is based on the number of stations needed and a rate of 10 bikes per station. Currently, the NiceRide system operates with 9 bikes per station. For this study, the bikes per station is set at 10 bikes per station. Below is the equation used to calculate the estimated number of bikes needed for phase 1 service areas.

- Bikes Needed = Total Number of Bike Stations Needed x 10

Trip Generation

The estimated number of annual trips by members and casual users is generated from performance metrics on average number of trips per year for annual members and the average number of trips per day for casual users. On average, NiceRide annual members take 43 trips per year and casual users take 2.5 trips per day. For this study, these same metrics are used to calculate annual trips for members and casual users.

14.1

Area of phase 1 service areas (square miles) for Atlanta and Decatur

570

Estimated bikes for phase 1 service areas

57

Estimated bikes stations for phase 1 service areas

Findings

The phase 1 service areas cover 14.1 square miles and are estimated to support 570 bikes at 57 stations. The number of bikes is based on a station density of 4 stations per square mile. The number of bikes is based on the assumption of 10 bikes per station.

These numbers are comparable to peer systems, including NiceRide and Capital BikeShare. The NiceRide system has a station density of 4 stations per square mile and 9 bikes per station. Similarly, Capital BikeShare has a station density of 4 stations per square mile and 7 bikes per station.

In terms of membership, it is estimated that phase 1 service areas can generate 3,422 annual members. It is also estimated that 30,000 casual users could use a system of this size. The rate of membership is based on adjusted subscription rates from the NiceRide Feasibility study and actual membership figures for NiceRide in 2011. Casual user rates are also based on adjusted casual user rates from the NiceRide Feasibility study and actual casual user figures for 2011.

It should be noted that these figures are intentionally conservative. The membership estimates are based solely on the residential, worker and student populations within the phase 1 service areas. In reality, members will live, work and go to school inside and outside the service areas. With additional research and market analysis, there could be additional demand for membership.

The same is true for casual users. The estimated number of casual users is based on percentages of usership of various groups from the Nice Ride feasibility study and adjusted based on actual casual users in 2011. Atlanta and Decatur could very well have greater casual user demand because of the number of tourists, conferences and events held in both cities.

It is also worth noting that these rates are static and do not take into account phasing or market absorption rates. Systems typically take 1 to 3 years to build up to full membership rates. As more bikes become available and people learn about bike share, more people are likely to use the system and sign up for membership or casual use.

Summary Demand Estimates for Atlanta and Decatur

	Atlanta	Decatur	Total
Annual Members	3,373	49	3,422
Casual Members	28,800	1,200	30,000
Number of Stations	54	3	57
Number of Bikes	540	30	570
Annual Trips by Annual Members	145,026	2,121	147,147
Annual Trips by Casual Users	72,000	3,000	75,000

Bike Share Demand Estimate for Atlanta and Decatur

	Atlanta			Decatur			Total
Membership and Casual User Estimates	Phase 1 Service Area Population	Project Annual Subscription Rate¹	Projected Number of Members	Phase 1 Service Area Population	Project Annual Subscription Rate	Projected Number of Members	
Membership							
Residents	86,831	1.2%	1,042	2,127	1.2%	26	
Workers	222,022	0.7%	1,554	1,833	0.7%	13	
Students	64,728	1.2%	777	883	1.2%	11	
Total Annual Members			3,373			49	3,422
Casual Users²							
Rate	96%			4%			
Total	28,800			1,200			30,000
Bike and Bike Station Estimates							
Area (sq miles)³	13.5			0.6			14.1
Stations @ 4 stations per sq mile⁴	54			3⁵			57
Bikes @ 10 bikes per station⁶	540			30			570
Annual Trip Estimates							
Annual Members⁷	145,026			2,121			147,147
Casual Users⁸	72,000			3,000			75,000

Notes

1. Rates developed based on adjusted annual subscription rates from original feasibility. The rates were adjusted based on actual membership in 2011 and phone interview with NiceRide operations management.
2. Total Casual users based on Nice Ride annual casual user rate in 2011. Rates for Atlanta and Decatur based on share of 2009 population for 18 to 64 in Atlanta and Decatur.
3. Area based on the phase 1 service areas identified in the community suitability analysis.
4. Nice Ride Station Density = 4 stations per square mile
5. Number of stations for Decatur is rounded up from 2.4 to the next highest integer.
6. 10 bikes per station is approximate ratio for Nice Ride, rounded up for ease of calculation
7. Based on Nice Ride rate of 43.1 annual trips per member in 2011
8. Based on Nice Ride Rate of 2.5 trips per casual user in 2011

Bike Share System Comparison

	Atlanta-Decatur	NiceRide ¹	Capital BikeShare ²	DecoBike ³
People	439,338	672,967	809,350	93,523
Area (sq mile)	94	116	94	8
People/sq mile	4,654	5,805	8,574	11,134
System Coverage Area	14	39	41	7
Number of Stations	57	145	174	113
Stations per sq mile	4	4	4	17
Number of Bikes	570	1,328	1,279	800
Number of Bikes per Station	10	9	7	7

Notes

1. Serves Minneapolis, St. Paul and Falcon Heights
2. Serves Washington D.C. and Arlington
3. Serves Miami Beach and Surfside

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Paying for Bike Share

Funding and financial performance strategies

Every successful bike share system requires capital and operation financial investment to function. The sources and strategies for operations can vary considerably depending on the type of business model selected.

This section examines the financial strategies Atlanta and Decatur need to consider for a bike share system. This section also tests the financial performance of a bike share system at the proposed scale identified in the community suitability analysis. The financial analysis helps identify initial capital investments needed as well as operational performance and funding needs.



Potential Operation Models

Successful bike share systems in the U.S. and other countries follow a variety of financial models, utilizing several different sources of funding and revenue for capital start-up, operating costs, system expansion, and other needs. The type of operational model selected should be given special consideration and selected based on degree of local control, funding service and level of performance risk shared between operators and jurisdictions.

For this study, four financial models have been reviewed and analyzed based on their advantages and disadvantages. The type of model for Atlanta and Decatur should be selected based on community goals, funding sources and other factors that need to be vetted after this study.

The following four financial models are all currently in operation in the United States or abroad. For additional information about each of the models below, see the Bike Share Overview chapter of this study.

Government Owner: Private Operator – Public & Private Funding

Capital Bikeshare in the Washington D.C. region is an example of a successful system utilizing this model. The District of Columbia and Arlington County, VA are the owners, Alta Bicycle Share, Inc. is the operator, and funding has come from the federal Congestion Mitigation and Air Quality (CMAQ) program, Virginia Department of Rail & Public Transportation, local sources, as well as usage and membership fees and sponsorships.

Advantages

- Jurisdiction has greater control over the program
- Private operators have the experience to operate a service
- Shifts some risk from public to private sector

Disadvantages

- Some risk to public agency for equipment theft and damage as well as crashes
- Agency may encounter difficulties in funding the service
- Operating and maintenance may cost more than other models

Transport Agency Owner: Transport Operator – Public & Private Funding

Having a transport agency implement and operate what is essentially a transit system using bicycles is a logical enterprise with many advantages. Successful bike-share systems that use this model are Montreal's Bixi, which started from the city's parking agency and Germany's nationwide rail and transport provider Deutsche Bahn and its Call-A-Bike service, which is offered throughout Germany.

Advantages

- Bike sharing fits transport agency's mission and mandate
- Administrative framework and operations expertise already exists
- Ability to use government funding sources

Disadvantages

- Places financial risk on transport agency
- Agency may not have the expertise to operate an effective bike-share system
- Motorized and rail transit-dominated thinking may curtail innovation

Non-profit Owner: Non-profit Operator – Public & Private Funding

This financing model shifts the financial and operations requirements from the public to the private sector. The Minneapolis/St. Paul Nice Ride system utilizes this model and receives its funding from federal programs, local government sources, and private sources such as Blue Cross/Blue Shield of Minnesota.

Advantages

- Minimizes financial risk to public agency
- Able to use government funding sources
- Makes profit motive secondary to providing a public service, may have economical operations costs compared with other models that demand profit

Disadvantages

- Creation of a non-profit entity with long-term commitment required
- Non-profit may not have expertise to operate system

For-profit Owner: Private Operator – Private Funding

This financing model provides an opportunity for partnership between the public and private sectors. The public sector can provide public property for the station locations and the private sector provides funding for the equipment and operations of the service. Examples of this model are DecoBike in Miami Beach and the upcoming Citi Bike in New York City.

Advantages

- Private owner is fully responsible for funding the service
- Government may benefit from a percentage of the revenue the service generates
- Experienced operator provides service

Disadvantages

- Municipality doesn't have as much control over the service as with other models
- Level of service may be lower than what the municipality may prefer

Contracts and Multiple Jurisdiction Coordination

The operational models on the previous pages highlight some of the common approaches cities or institutions have taken to operate a bike share system. The contracts for these operations are generally between a single owner, such as a city, and a service provider, such as a vendor and/or operator.

In addition to these one-to-one contacts, some cities have tried using other contracting methods to operate bike share. These contract methods include incorporating bike share under a general street furniture contract, multi-jurisdiction operations and other mixed operations models. These methods, as well as general multi-jurisdiction operations, are discussed below.

U.S. Examples of Street Furniture Contract

In many cities throughout Europe, outdoor advertising companies like Clear Channel Outdoor, JCDecaux, and Cemusa have offered a “free” bike share service to municipalities in exchange for exclusive rights to the public right-of-way for advertising purposes. Outdoor advertisements can include ads on bus shelters, billboards, public toilets, and kiosks, with the facilities owned and maintained by the company. Bike share services that operate under this model include the cities of Paris, Oslo, and Brussels.

The outdoor advertising model, while successful in Europe, has not proven so in the U.S. Clear Channel Outdoor attempted to follow this model with the launch of SmartBike D.C. in 2008 in Washington, D.C.; however, the system ceased operation in 2010 and was replaced by Capital Bikeshare that same year with a public-private partnership model and with a different equipment vendor and operator. Since then these three outdoor advertising companies have not bid on municipal bike sharing tenders in the U.S. and no such outdoor advertising model bike share services exist in North America.

With the outdoor advertising model seemingly offered for “free”, in fact, the locality would in fact indirectly pay for the bike-share service. Outdoor advertising contracts usually have the company giving a portion of its revenues to the locality for the right to place advertisements on public space. When the company provides a bike share service in addition to its street furniture, it must offer less revenue to the locality in order to pay for the bike-share service. Today, many cities around the world are unbundling the bike share service from the outdoor advertising contract in order to increase competition from bike share service operators and vendors for their business, while obtaining greater revenue from the outdoor advertising itself.

Emerging Mixed Operations Models

A new business model is forming where risk, profit, ownership and costs are shared by multiple parties. With this model, the operator pays for the equipment and operations and the city provides the public space for the stations. Both parties benefit from the revenue generated.

This model is being piloted with the New York City Citi Bike service, scheduled to launch in March 2013 and to be operated by Alta Bike Share. The model should likely come online next year in Los Angeles as well and be operated by Bike Nation, as reported in The Los Angeles Times.

This model is likely to work well in cities where ridership is predicted to be high enough to support the capital and operating costs of the service, plus provide projected revenues for the operator. New York City's service has the additional support of a title sponsor, Citi Bank, and an equipment sponsor, MasterCard.

Benefits of a Unified System

There are many benefits of having a unified system throughout the region instead of separate systems, including customer-friendliness, network effect, and ability to be more efficient. Regarding customer-friendliness, one is looking to get from point A to B as cheaply and quickly as possible. If the trip crossed borders between jurisdictions, potential hurdles of needing to join both bike-share services has a financial and time cost, or needing to change bikes from one service to the other at the city line would slow customers. The fewer obstacles to encouraging membership and trip-making between jurisdictions would encourage greater membership and trips.

Jurisdictions with bike-share services find that ridership increases geometrically as the station network expands and increased travel options become available for each customer. Having separate systems would limit the network effect of each jurisdiction as stations in the other jurisdiction(s) wouldn't necessarily take advantage of this effect.

Administering a transit service, such as bike sharing, takes a lot of effort. Having a larger team of each municipalities' staff to support daily and long-term needs of the service benefits everyone. There are many associated benefits of having a regional system, such as developing and printing marketing materials, surveying customers on their user experience, creating the service website, and paying for these costs.

Examples of How Jurisdictions Work Together to Operate Bike Share

There are examples of municipalities within the same region working together on providing a bike sharing service. What is now Capital Bikeshare was initiated by a Request for Proposals by Arlington County, VA and included Washington, D.C.; Montgomery County, MD; and the City of Alexandria, VA on the selection committee. The included municipalities have since used an appendix of the Arlington contract -- called the Metropolitan Washington Council of Governments rider, which was developed by the region's metropolitan planning organization -- to obtain the same scope of work as Arlington without needing to rebid the project. Through the rider, similar capital pricing is extended to each municipality; however, operating pricing is slightly different based on: a) how D.C.'s contract with the operator was established, and b) Alexandria's and Montgomery County's greater distance from the operator's warehouse.

As each municipalities' contract with the operator does not cover issues relative to the relationship among the municipalities, they have created an informal Inter-jurisdictional Agreement (IJA) to cover these items. The IJA includes such topics as:

- Regional revenue-sharing for membership and usage fees based on the member jurisdiction where a member lives and the jurisdiction where each revenue-generating trip begins
- Governing structure and authority
- Advertising and marketing
- Fleet size
- Comments and complaints

Other examples of regional coordination include the Boston region's cooperation on the expansion of Hubway into adjacent localities and Denver and Boulder's cooperation with membership compatibility.

Potential Revenue Sources

Bike share systems are funded by a variety of sources, and many systems diversify their funding to distribute risk. Nearly all current systems earn revenues from membership and user fees, and a majority of successful systems receive some kind of start-up capital to launch their systems. The following sections summarize the types of sources and how other systems have used these sources. Additionally, this section identifies potential federal, state and local funding sources.

User-Generated

Nearly all North American bike-share systems rely on membership and user fees to offset the capital and operating costs associated with the system, some to a larger degree than others. The Arlington, VA portion of Capital Bikeshare saw its Year 1 return on memberships and user fees result in an 81% operating cost recovery and 53% total cost recovery; these results were from Arlington's 18 stations out of the larger regional 116-station service at the time.

In the most common bike share operational models, users pay two types of fees to use the system:

- A membership or access fee paid up front to register for the system. These memberships range from one day to one year.
- Usage fees charged on top of the membership fee and based on how long the customer uses the system each time he or she checks out a bike. Most systems in North America offer a free period of 30 or 60 minutes where the user pays no additional fee if the bike is returned before the period ends. To prevent docking and re-renting to escape a usage fee, the time period between rentals may be increased to a couple of minutes. There is also a per minute usage fee model that charges a flat rate per minute up to a flat day rate. This model is used in some smaller services in Europe.

Examples Membership Fees

- \$45 - \$85 for one year
- \$15 - \$25 for one month
- \$15 - \$30 for 3 to 7 days
- \$4 - \$7 for 1 day

Example Usage Fees

- Free for the first 30 - 60 minutes
- Additional fee for every 30 minutes thereafter
- Discounted or undiscounted per minute fee either with or without a membership

Advertising and Sponsorship

Many bike share systems in the U.S. receive revenues from advertising and/or sponsorship. With sponsorships, an entity may purchase a title or station sponsorship. Title sponsorship could include naming rights to the service and ability to place the organization's branding on equipment, website, and marketing materials. A station sponsor could include a request for actual station placement and opportunity to place the sponsor's logo on the station and website. Advertising may take the form of print ads displayed on map frames at bike-share stations or on the bikes.

One example of sponsorship is the New York City bike share system set to launch in Spring 2013. Title sponsorship is being provided by Citi Bank to the tune of \$41 million over 5 years; the system will bear the name "Citi Bikes" and the trademark Citi Bank royal blue color scheme. In addition, MasterCard is a station sponsor for the system, and will have its logo on the station kiosks for a sponsorship of \$6.5 million. Because of this high level of private financing, the New York system is not expected to rely on any public funding.

Additional examples of title sponsorships include:

- Blue Cross/Blue Shield of Minnesota Center for Prevention; sponsored Minneapolis Nice Ride for \$2.5 million
- New Balance shoe company paid \$600,000 for naming rights to Boston's Hubway
- Barclays Bank's title sponsorship of London's system was \$36.4 million

Private Grants and Community Partnerships

In many cities, local businesses, foundations and other private entities have played a key role in helping launch new systems with financial assistance. Boulder, CO's B-Cycle received funding from the Tides Foundation, while nearby Denver B-Cycle got started with help from the Walton Family Foundation, the Anschutz Foundation, Gates Family Foundation, University of Colorado Hospital, and the Denver 2008 Democratic Convention Host Committee.

One benefit to seeking private grants and community partnership funding for bike share is the flexibility these sources offer as opposed to some categories of federal funding which specify what the funds can be used for. Arlington, VA's portion of Capital Bikeshare has benefited from several different community partners, including:

- Crystal City Business Improvement District, which donated \$200,000 for a capital equipment purchase match
- George Mason University, which gave \$36,000 for a one-time capital purchase and \$14,000/year for operating
- "FAST for Potomac Yard", which gave \$36,000 for a one-time capital purchase plus \$14,000 per year for operating a station in their neighborhood

Public Funding and Program Matrix

Funds	Source	Example
Federal		
CMAQ (Congestion Mitigation and Air Quality Improvement program)	Federal Highways Administration, USDOT	Arlington, VA - \$2.14 million for capital Washington, DC - \$6 million for capital and operating Chattanooga, TN - \$2 million for capital and operating Boston, MA - \$250,000 for capital and operating
Bus and Bus Livability TIGER III	Federal Transit Administration, USDOT USDOT	Boston, MA - \$3 million for capital Chicago, IL - \$6 million for capital
Federal Lands Highways Program (FLHP) & Transit in Parks Program (TRIP)	National Park Service	St. Paul, MN - \$480,000 for capital (FLHP), \$843,140 for capital (TRIP) San Antonio, TX - \$324,000
Energy Efficiency Community Block Grant (EECBG)	U.S. Department of Energy	San Antonio, TX - \$920,866 for capital
Communities Putting Prevention to Work (CPPW)	Centers for Disease Control and Prevention (CDC), U.S. Department of Health and Human Services	San Antonio, TX - \$339,880 for capital
State Funds		
Transportation Enhancement	GDOT	Bicycle and pedestrian facilities related to the surface transportation system; Safety and activities for bicycles and pedestrians
Local Funds		
Community Improvement Districts	Tax, fee or assessment of commercial properties within district; Bonds	Local match for state or federal funding; Transit service; Street and public space improvements, such as parks
Tax Allocation District	Local government or development authority	BeltLine; Invest Atlanta
Development Authority	Bonds issued by authority	Decatur Development Authority; Invest Atlanta
Impact Fees	Developers (Atlanta only)	General funds for capital improvements
Quality of Life Bonds	Bonds issued by city (Atlanta only)	Transportation and public space improvements, such as traffic controls, bike lanes, parks and other public amenities.

Financial Models

Two financial analyses were performed - one using a fixed station model and the other using the flexible non-station model. The sample pricing used for the analysis incorporates sample pricing from contract pricing for the Arlington County, VA portion of the Capital Bikeshare system. The vendor is Public Bike System Company and the operator is Alta Bicycle Share. The sample pricing was selected because it represents a public system operating at the city-scale. The system is also one of the peer city systems analyzed as part of this study.

In addition to the cost assumptions, the following implementation assumptions were used to structure the analyses:

- The service is launched with 50% of the proposed fleet and expands 25% each year for the next two years, as additional funding becomes available, to reach the full proposed fleet size after five years.
- The client, such as Atlanta or Decatur, hires a vendor to supply the bikes and an operator to operate the service.

The financial performance is based on the phase 1 service area metrics developed for Atlanta and Decatur. The metrics include 570 bikes and 57 stations serving 3,422 members and 30,000 casual users annually. The financial analysis assumes membership and casual user rates are constant year over year i.e. 3,422 members in year one and all subsequent years. In practice, membership will increase over time and reach saturation levels as the system is built out.

The model covers the estimated life-cycle of a bike share system, or the time elapsed until the system needs to begin replacing equipment due to wear and tear or technology improvements. For this model, the life-cycle is six years. The first five years cover the original capital investment in infrastructure and replacement begins in year six.

Operating revenues for both models are the same. The projected membership and ridership does not take into account user preferences for one bike sharing technology versus another. The public will likely have preferences on bike comfort, ease of use, and fast check-out and return which would affect actual system usage.

To calculate the operating revenue from membership and casual user fees, also known as farebox recovery, two methods are used to determine revenue:

- A: a 50% farebox recovery of operations expenses; and
- B: projected annual and casual memberships and trips based on population and employment data

For the purpose of this model, farebox recovery method B is used to calculate the operating cost recovery amounts as it has produced a more conservative result.

It is worth noting that this model only includes revenue from farebox recovery and does not include capital revenue or additional operating revenue beyond farebox recovery. These assumptions, and the financial gaps they create in the model, are intentional. They highlight financial components of both models that require additional financing to operate successfully. The gaps can be filled by vendor or operator funding, public investment such as grants, or private investment such as sponsorship.

Obtaining this capital and operating funding from title and station sponsorships, local and state funds, and grants is important from the start. Bike sharing is a mode of transit, and even at 50% farebox cost recovery -- which is quite high compared to bus and rail transit -- it's important that financial gaps are planned for to ensure a self-sustaining mode of travel. A mix of these funding sources would likely be most beneficial so as to not become reliant on any one and have no choices if that sole source disappears.

Capital and Operating Plan Assumptions

Assumptions	Rate/Years
Rates	
Operating Cost Inflation Rate	3.5%
Capital Cost Inflation Rate	5.0%
Farebox Recovery	50%
Bicycle Annual Replacement Rate	1%
Annual Bicycle Fleet Parts Replacement Rate	25%
Life-cycle	
Bicycle Useful Life	5 years
Terminal Useful Life	10 years
Installation and Phasing	
% Stations Needing Concrete Pad (Fixed Station Only)	33%
1st Year % of Stations Installed	50%
2nd Year % of Stations Installed	25%
3rd Year % of Stations Installed	25%
4th Year % of Stations Installed	0%
Average Station Size (Fixed)	19 docks 10 bikes
Average Station Size (Flexible)	2 bikes per rack
User Fees	
Annual Membership Fee	\$75
Casual Day Membership Fee	\$7
30-minute Usage Fee	\$1.50
% of Trips Generating Usage Fee	10%
Staff	
Management contract or staff (2 full-time employees)	\$125,000

Example Bike Share System Costs

Two types of equipment vendors are reviewed to present a comparison of system costs. Public Bike System Company (PBSC), based in Montreal, is used to analyze the costs associated with a fixed station system. This type of system has stations with a variable number of docks and a kiosk at each location. PBSC offers a solution that is used in many cities around the world, including Boston, London, Melbourne, and Washington, D.C. The associated capital costs with a fixed station system are on the higher end of equipment vendors.

viaCycle, based in Atlanta, is used to analyze the costs associated with a flexible station system. With flexible station systems, most of the enabling technology is integrated into the bike. This approach reduces the need for more expensive stations and kiosks. To lock bikes, flexible systems can use standard bike racks or other fixed objects because a locking mechanism is built into the bike.

It is worth noting that there are two main challenges associated with flexible station systems. One challenge is that they currently depend exclusively on customer mobile technology, such as cell phones or smartphones, to check out a bike. The other challenge is that flexible station systems are less visible because they lack the same visual recognition and signage associated with fixed station systems. While flexible station systems offer more economical infrastructure, the savings can be diminished if customers and non-members are not able to easily locate and use bikes.

For the cost comparison, costs are separated into capital costs and operating costs. Capital costs consist of purchases such as station equipment, support vehicles such as vans and bikes which assist with balancing and maintenance, tools, furnishings, supplies, IT services, and web design. Operating costs include maintaining bikes, stations, and facilities; balancing the system; wireless communication of the stations or bikes (depending on the equipment); customer service; warehouse rental; upkeep of software and communications; insurance; salaries; marketing; and public relations.

The table on the following page shows samples costs from PBSC and viaCycle. In addition to providing them for comparison, they are also used to calculate the financial performance of both systems later in this chapter. Other vendors have a range of costs similar to the vendors studied here.

Sample Flexible Non-Station Costs

Owner: Georgia Tech

Operator: viaCycle

Vendor: viaCycle

Note: prices are from viaCycle at Georgia Tech, with the exception of the station information panel, which was developed using prices from Arlington, VA Capital Bikeshare contract (56-09) for June 2012 - May 2013

CAPITAL EQUIPMENT COSTS	Costs
bike with integrated locking system (< 50 units)	\$1,500
bike with integrated locking system (>= 50 units)	\$1,300
standard bike rack and installation	\$500
station information panel development	\$7,000
station information panel frame (1 per station)	\$1,496
station information panel and printing (1 per station)	\$100
station information panel update	\$500
OPERATING & MAINTENANCE (O&M) COST PER BIKE PER MONTH	\$80

Above pricing includes maintenance, balancing, wireless connectivity for bikes, website, smartphone app, backend software, cost of servers and backup, replacement parts, technology support

Sample Fixed Station Costs

Owner: Washington, D.C. & Arlington, VA

Operator: Alta Bicycle Share

Vendor: Public Bike System Company

Note: prices from Arlington, VA Capital Bikeshare contract (56-09) for June 2012 - May 2013

CAPITAL EQUIPMENT COSTS (includes map frame, kiosk, shipping & handling)	Costs
11-dock/6-bike station	\$37,476
15/8 station	\$45,941
17/9 station	\$51,747
19/10 station	\$54,405.00
21/11 station	\$62,809
23/12 station	\$71,091
OPERATING & MAINTENANCE (O&M) COST PER DOCK PER MONTH	\$107

Above pricing includes maintenance, balancing, support vehicles, call center, website, smartphone app, replacement parts, backend software, station wireless connectivity, monthly reporting, and technology support.

ADDITIONAL COSTS

STATION INSTALLATION	
Station Installation 11 - 26 docks	\$3,000
Station Installation 27+ docks	\$3,500
STATION/PLATE MOVEMENT	
Movement of 1-4 plates on day when another station is being installed or relocated*	\$1,000
Movement of 5-8 plates on day when another station is being installed or relocated*	\$1,500
Movement of 1-4 plates on day with no other station installations or relocations*	\$1,500
Movement of 5-8 plates on day with no other station installations or relocations*	\$2,250
Movement of 1-4 plates by pallet jack	\$375
CONCRETE PAD CONSTRUCTION	
Concrete pad for 15-dock station	\$3,500
STATION PLAN DESIGN WITH CADD	
CADD drawing	\$1,000
STATION MAP	
Map creation	\$7,000
Map printing per station	\$100
Map update	\$500

ADDITIONAL EQUIPMENT (includes shipping and handling)	
Bicycle (3-speed + fender + capacitor light) (Each):	\$1,209
Bicycle (7-speed + fender + capacitor light) (Each):	\$1,300
Complete Terminal (Each):	\$11,408
Complete Dock (Each):	\$880
Station Component Cable: Blue (Each):	\$122
Black (Each):	\$119
Red (Each):	\$114
Technical Platform (Each):	\$1,139
Technical Platform (With Docking Points)	\$4,471
Technical Platform 180 degree (Each):	\$2,100
Technical Platform 180 degree (With Docking Points):	\$4,034
Technical Platform 90 degree (Each)	\$1,393
Technical Platform 90 degree Elbow (Each):	\$745
Technical Platform 45 degree Right (Each):	\$1,168
Technical Platform 45 degree Left (Each):	\$1,168
Technical Platform Half (Each):	\$791
Technical Platform Quarter (Each):	\$547
Technical Platform Dual (Each):	\$1,197
Custom Dual End for Technical Platform (Each):	\$726
End Cap Standard (Each):	\$58
End Cap 180 Degree (Each):	\$440
Map Frame (Each):	\$1,496
Station Battery (Each):	\$210
Customer Key (Each):	\$3
Bicycle Spare Parts (Per Bicycle, on as needed basis):	\$120
Station Spare Parts (Per Station):	\$417
Toolkit (Each):	\$1,228
Station Paper (Each):	\$10

Flexible Station Cost Estimates

\$1.7 million

for capital expenses over six years

\$4.3 million

for operation expenses over six years

\$6.0 million

for total expenses over six years

Financial Performance Summary

By comparison, the flexible station model has lower capital and operating expenses than a fixed station system. The range in capital expenses between the two systems is approximately \$1.7 -3.7 million, or a difference of \$2.0 million. In terms of operational expenses, the two systems range from \$4.3 to \$9.2 million, or a difference of \$4.9 million. Operating revenues are the same and held constant for both systems.

The differences in financial performance are related to technology and infrastructure. Fixed stations, such as the system supplied by Public Bike System Company, require specialized stations for locking and accessing the system. The locking mechanism is separate from the bike and requires a fixed dock to accommodate bikes at stations. Depending on the type of system, there are varying degrees of flexibility with dock installation and costs.

The higher costs associated with fixed station systems are also related to the kiosks. The kiosks provide digital access to the system. The kiosks allow anyone with a credit card to sign up, either as a casual user or as a member, at the station rather than having to sign up remotely via a computer or smartphone with internet access.

The kiosks can also provide digital information about nearby stations, system maps, bicycle safety information or other information related to using the system, as well as space for advertising. These features can help users access and operate the system, providing system visibility and space for revenue generation associated with advertising.

With flexible stations such as viaCycle, the cost savings come from having the locking mechanism and access features integrated into the bike. This type of technology allows bikes to use standard bike racks, which are significantly less expensive than the specialized docks associated with fixed station models.

Additionally, this technology does not require kiosks to access the system. Instead, checking out a bike is done with the use of a mobile device, such as a cell phone or smartphone.

While the flexible station model provides considerable capital and operational savings, there are trade-offs. Without a kiosk, casual users or potential members can not sign up at a station or drop-off area. This requirement could discourage potential users from using bike share and diminish the spontaneity bike share offers by accessing a bike at any moment.

Financial Performance Summary

	Capital Expenses	Capital Revenue	Capital Balance	Operating Expenses	Operating Revenue	Operating Balance
Fixed Station: 6 year schedule	\$ 3,704,910	\$ -	\$ (3,704,910)	\$ 9,216,377	\$ 2,624,978	\$ (6,591,399)
Flexible Station: 6 year schedule	\$ 1,720,070	\$ -	\$ (1,720,070)	\$ 4,315,332	\$ 2,624,978	\$ (1,690,354)

Additionally, access only via online or mobile device brings up social equity issues. Not everyone has or can afford a mobile device. Likewise, not everyone has access to a computer and the internet. By requiring this type of technology access to sign up and use a flexible station system, some people in the community may be excluded or discouraged from using the system.

One analogy that works well in describing the access differences is a comparison with public transportation access, such as MARTA. Fixed station systems operate similarly to MARTA in terms of access and payment. MARTA users have the option to sign-up online or pay at the point of access, such as at a transit station or when boarding a bus. Fixed stations operate in a similar fashion by allowing users to sign-up in advance online or at a bike share station by using a kiosk.

By comparison, flexible station systems operate using a more closed system and do not provide users the option to sign-up or pay for the system at the point of access. Instead, users must establish an account prior to using the system. This step can be done by using a smartphone or signing up via a computer or other device with an internet connection. The requirement to setup an account before using a flexible station system could be an inconvenience for potential users. It could also be a barrier to using the system, particularly for casual users such as tourists.

System signage and advertising space are also diminished with a flexible station system. Fixed stations, as mentioned previously, can provide advertising space, space for maps and information signage that enhances station visibility. Flexible station systems, such as viaCycle, currently do not offer these features.

Even though flexible station systems currently use minimal signage, a map frame similar to ones used with fixed station systems was included in the cost calculations for the flexible station system. The additional signage was included with the assumption that any city-wide system will need a minimum amount of signage to provide information for users.

A final trade-off between the two systems is related to the locking strategy. With fixed stations, the specialized locking mechanism and dedicated locking space means that bikes have a dedicated place to lock and return a bike. With flexible systems, they can use any street feature to lock a bike, including regular bicycle racks. Without dedicated space to lock the bikes, flexible station bikes may compete for limited bicycle parking for cyclists using their own bikes. Flexible station bikes can also take away space for cyclists using their own bikes, which could diminish their convenience and access to community destinations.

However, this flexibility can also be a benefit. Flexibility with where the bike is locked can reduce full stations or remedy a situation where there are no open docks available, which can happen with fixed station systems. When this occurs with fixed station systems, users have to find the next closest station with open docks to return a bike. The locking flexibility associated with flexible station systems can help resolve this issue.

The sections on the following pages provide more detailed financial analysis of the two bike share models and describe the capital and operational requirements for each. Additionally, both systems include a replacement schedule to summarize the long-term requirements to operate and maintain the systems.

Fixed Station Cost Estimates

**\$3.7
million**

for capital expenses over six years

**\$9.2
million**

for operation expenses over six years

**\$12.9
million**

for total expenses over six years

Fixed Station Financial Performance

A fixed station model using Public Bike System Company as the equipment vendor, or another fixed station vendor of a similar quality such as B-cycle or Sandvault, would require approximately \$3.7 million over six years for capital expenses and \$9.2 million for operating expenses over the same period. Combined, the total system cost over 6 years is \$12.9 million.

Using fairbox revenue model B, the projected operational revenue generated from membership revenue and usage fees is \$2.6 million. This leaves an operating gap of \$6.6 million. When combined with the capital expenses, the total financial gap over the six year projection period is \$10.3 million. Filling this financial gap would make the system profit neutral. Additional revenue would be needed to make the system turn a profit.

In terms of phasing, the greatest capital expenses are incurred during Year 1 to 3 as the system is phased in to full operation. In Year 6, capital costs increase again as bikes and stations are scheduled for replacement.

For operational expenses, costs increase steadily over the six year period as bikes are phased into the system and as costs increase due to inflation. Additionally, the increase in operating costs from Year 1 to 3 is primarily associated with the increased number of bikes and stations in operation. The increases in costs from Year 4 to 6 are primarily associated with inflation as the number of bikes and stations in operation is held constant.

To address the estimated full-life cycle for a system, the replacement schedule is presented on the following page. The schedule accounts for a 15 year life-cycle for the system and addresses station and bicycle replacement as well as associated costs.

Fixed Station Capital Budget

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total
Expansion %	50%	25%	25%	0	0	0	
New Stations (Includes Bicycles)	\$ 1,309,306	\$ 687,385	\$ 720,118	\$ -	\$ -	\$ -	
New Station Installation	\$ 85,500	\$ 44,888	\$ 47,025	\$ -	\$ -	\$ -	
 New Capital Equipment Subtotal	 \$ 1,394,806	 \$ 732,273	 \$ 767,143	 \$ -	 \$ -	 \$ -	
Replacement Schedule Expenditures	\$ -	\$ 8,945	\$ 23,385	\$ 44,029	\$ 66,473	\$ 513,215	
Concrete Pad Construction	\$ 32,918	\$ 17,282	\$ 18,105				
Station Plan Design	\$ 28,500	\$ 14,963	\$ 15,675				
Map Creation/Update and Printing	\$ 9,850	\$ 2,450	\$ 2,475	\$ 3,778	\$ 2,500	\$ 2,525	
 CAPITAL EXPENDITURES TOTAL	 \$1,466,073	 \$775,912	 \$826,783	 \$47,807	 \$68,973	 \$515,740	 \$3,701,287

Capital Revenues: Grants, advertising, title and station sponsorships, or local and state funds are to be identified and secured at a later date.

CAPITAL REVENUES TOTAL	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	TBD
 CAPITAL BUDGET BALANCE	 \$(1,466,073)	 \$(775,912)	 \$(826,783)	 \$(47,807)	 \$(68,973)	 \$(515,740)	 \$(3,701,287)

Fixed Station Operation Budget

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total
Monthly Operating Cost Per DOCK	\$ 107.22	\$ 110.98	\$ 114.86	\$ 118.88	\$ 123.04	\$ 127.35	
Start of the Year Projected Number of DOCKS	542	812	1,083	1,083	1,083	1,083	
Annual System Operating Cost	\$ 696,731	\$ 1,081,675	\$ 1,492,712	\$ 1,544,957	\$ 1,599,030	\$ 1,654,996	
Total Contractor Operating Costs	\$ 696,731	\$ 1,081,675	\$ 1,492,712	\$ 1,544,957	\$ 1,599,030	\$ 1,654,996	
Management Contract/Staff	\$ 125,000	\$ 129,375	\$ 133,903	\$ 138,590	\$ 143,440	\$ 148,461	
Marketing Budget	\$ 50,000	\$ 51,750	\$ 53,561	\$ 55,436	\$ 57,376	\$ 59,384	
Administration Cost Total	\$ 175,000	\$ 181,125	\$ 187,464	\$ 194,026	\$ 200,817	\$ 207,845	
OPERATING EXPENSES TOTAL	\$ 871,731	\$ 1,262,800	\$ 1,680,176	\$ 1,738,982	\$ 1,799,847	\$ 1,862,841	\$ 9,216,377
Operating Revenues							
TBD - grants, advertising, title and station sponsorships, local and state funds	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Farebox Revenues Projection - Method A (projected farebox recovery) ¹							
Revenue	\$ 348,366	\$ 540,838	\$ 746,356	\$ 772,478	\$ 799,515	\$ 827,498	\$ 4,035,050
Farebox Revenues Projection - Method B (based on projected ridership)							
Membership Revenues ²	\$ 233,337	\$ 350,005	\$ 466,674	\$ 466,674	\$ 466,674	\$ 466,674	\$ 2,450,038
Usage Fee Revenues ³	\$ 16,661	\$ 24,991	\$ 33,322	\$ 33,322	\$ 33,322	\$ 33,322	\$ 33,322
OPERATING REVENUES TOTAL (using Method B)	\$ 249,998	\$ 374,997	\$ 499,996	\$ 499,996	\$ 499,996	\$ 499,996	\$ 2,624,978
OPERATING COST RECOVERY (Net Gain or Loss)	\$ (621,733)	\$ (887,803)	\$ (1,180,180)	\$ (1,238,986)	\$ (1,299,851)	\$ (1,362,845)	\$ (6,591,399)

Notes

1. Assumes flat 50% cost recovery.
2. Assumes no increase in membership without addition of new stations.
3. Assumes no increase in trips without addition of new stations.

Fixed Station: Replacement Schedule

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Station Replacement Schedule						
Total Number of Stations (End of Year)	29	43	57	57	57	57
Number of Expansion Stations	29	14	14	0	0	0
State of Good Repair (SGR) Replaced Stations	0	0	0	0	0	0
Total Number of New Stations	29	14	14	0	0	0
1 year old stations		29	14	14	0	0
2 year old stations			29	14	14	0
3 year old stations				29	14	14
4 year old stations					29	14
5 year old stations						29
6 year old stations						
7 year old stations						
8 year old stations						
9 year old stations						
Stations to replace due to end of useful life						
Bicycle Replacement Schedule						
Bicycles in service (Start of Year)	0	285	428	570	570	570
Expansion Bicycles in service	285	143	143	0	0	0
Total Bicycles in service	285	428	570	570	570	570
Bicycles replaced due to theft or vandalism	3	4	6	6	6	6
SGR Replaced Bicycles						
Total New Bicycles (Expansion and Replaced)	288	147	148	6	6	6
1 year old bicycles		285	145	147	6	6
2 year old bicycles			282	144	145	6
3 year old bicycles				279	142	144
4 year old bicycles					277	141
5 year old bicycles						274
Bicycles to replace due to end of useful life	0	0	0	0	0	274
Bicycle Price	\$1,209	\$ 1,269	\$ 1,333	\$ 1,400	\$ 1,470	\$ 1,543
Cost of bicycles replaced due to theft or vandalism	\$3,446	\$ 5,427	\$ 7,597	\$ 7,977	\$ 8,376	\$ 8,795
Cost of bicycles replaced due to expiration of useful life		\$ -	\$ -	\$ -	\$ -	\$422,378
Annual parts replacement per new bicycle (failure and minor vandalism)	\$ 120	\$ 126	\$ 132	\$ 138	\$ 145	\$ 153
Average age of fleet at year end (multiplier reflecting increased parts failure for older bikes)		0.67	1.24	2.23	3.21	4.18
Parts replacement cost (assuming 25% of fleet requires it annually)		\$ 8,945	\$ 23,385	\$ 44,029	\$ 66,473	\$ 90,837
Total	\$ -	\$ 8,945	\$23,385	\$44,029	\$66,473	\$513,215

Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
57	57	57	57	57	57	57	57	57
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	29	14	14
0	0	0	0	0	0	29	14	14
0	0	0	0	0	0	0	29	14
0	0	0	0	0	0	0	0	29
0	0	0	0	0	0	0	0	29
14	0	0	0	0	0	0	0	0
14	14	0	0	0	0	0	0	0
29	14	14	0	0	0	0	0	0
	29	14	14	0	0	0	0	0
		29	14	14	0	0	0	0
			29	14	14	0	0	0
				29	14	14	0	0
570	570	570	570	570	570	570	570	570
0	0	0	0	0	0	0	0	0
570	570	570	570	570	570	570	570	570
6	6	6	6	6	6	6	6	6
274	140	141	5	5	5	266	138	139
279	145	147	11	11	11	271	144	145
6	277	144	145	11	11	11	269	142
6	6	274	142	144	11	11	11	266
6	6	6	271	141	142	11	11	11
142	5	5	5	268	140	141	11	11
140	141	5	5	5	266	138	139	11
140	141	5	5	5	266	138	139	11
\$ 1,620	\$ 1,701	\$ 1,786	\$ 1,875	\$ 1,969	\$ 2,068	\$ 2,171	\$ 2,280	\$ 2,394
\$ 9,235	\$ 9,696	\$10,181	\$10,690	\$ 11,225	\$ 11,786	\$ 12,375	\$ 12,994	\$ 13,644
\$226,140	\$239,752	\$9,682	\$10,166	\$10,675	\$549,495	\$299,965	\$317,901	\$25,314
\$ 160	\$ 168	\$ 177	\$ 185	\$ 195	\$ 205	\$ 215	\$ 225	\$ 237
2.28	1.81	1.33	2.27	3.20	4.12	2.31	1.86	1.41
\$ 52,108	\$ 43,367	\$33,442	\$59,934	\$ 88,727	\$ 119,977	\$ 70,832	\$ 59,913	\$ 47,497
\$278,248	\$283,119	\$43,124	\$70,100	\$99,402	\$669,472	\$370,797	\$377,815	\$72,811

Flexible Station Financial Performance

A flexible station model using viaCycle as the equipment vendor, or another flexible station vendor of a similar quality, would require approximately \$1.7 million over six years for capital expenses and \$4.3 million for operating expenses over the same period. Combined, the total system cost over six years is estimated at \$6 million.

Using fairbox revenue model B, the projected operational revenue generated from membership revenue and usage fees is \$2.6 million. This leaves an operating gap of \$1.7 million. When combined with the capital expenses, the total financial gap over the six year projection period is \$3.4 million. Filling this financial gap would make the system profit neutral. Additional revenue would be needed to make the system turn a profit.

In terms of phasing, the greatest capital expenses are incurred during Year 1 to 3 as the system is phased in to full operation. In Year 6, capital costs increase again as bikes and stations are scheduled for replacement.

For operational expenses, costs increase steadily over the six year period as bikes are phased into the system and as costs increase due to inflation. Additionally, the increase in operating costs from Year 1 to 3 is primarily associated with the increased number of bikes and stations in operation. The increases in costs from Year 4 to 6 are primarily associated with inflation as the number of bikes and stations in operation is held constant.

To address the estimated full-life cycle for a system, the replacement schedule is presented on the following page. The schedule accounts for a 15 year life-cycle for the system and addresses station and bicycle replacement as well as associated costs.

Flexible Station Capital Budget

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total
Expansion %	50%	25%	25%	0	0	0	
New Stations (Includes Bicycles)	\$ 370,500	\$ 185,250	\$ 185,250	\$ -	\$ -	\$ -	
New Station Installation	\$ 85,500	\$ 42,750	\$ 42,750	\$ -	\$ -	\$ -	
New Capital Equipment Subtotal	\$ 456,000	\$ 228,000	\$ 228,000	\$ -	\$ -	\$ -	
Replacement Schedule Expenditures	\$ -	\$ 8,945	\$ 23,385	\$ 44,029	\$ 66,473	\$ 545,021	
Station Information Panel Creation, Update and Printing	\$52,474	\$29,737	\$29,737	\$3,778	\$2,210	\$2,281	
CAPITAL EXPENDITURES TOTAL	\$508,474	\$266,682	\$281,122	\$47,807	\$68,683	\$547,302	\$1,720,070
Capital Revenues: Grants, advertising, title and station sponsorships, or local and state funds are to be identified and secured at a later date.							
CAPITAL REVENUES TOTAL	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	TBD
CAPITAL BUDGET BALANCE	\$(508,474)	\$(266,682)	\$(281,122)	\$(47,807)	\$(68,683)	\$(547,302)	\$(1,720,070)

Flexible Station Operation Budget

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total
Monthly Operating Cost Per DOCK	\$80.00	\$82.80	\$85.70	\$88.70	\$91.80	\$95.01	
Start of the Year Projected Number of DOCKS	285	428	570	570	570	570	
Annual System Operating Cost	\$273,600	\$424,764	\$586,174	\$606,690	\$627,925	\$649,902	
Total Contractor Operating Costs	\$273,600	\$424,764	\$586,174	\$606,690	\$627,925	\$649,902	
Management Contract/Staff	\$125,000	\$129,375	\$133,903	\$138,590	\$143,440	\$148,461	
Marketing Budget	\$50,000	\$51,750	\$53,561	\$55,436	\$57,376	\$59,384	
Administration Cost Total	\$175,000	\$181,125	\$187,464	\$194,026	\$200,817	\$207,845	
OPERATING EXPENSES TOTAL	\$448,600	\$605,889	\$773,639	\$800,716	\$828,741	\$857,747	\$4,315,332
Operating Revenues							
TBD - grants, advertising, title and station sponsorships, local and state funds	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Farebox Revenues Projection - Method A (projected farebox recovery) ¹							
Revenue	\$136,800	\$212,382	\$293,087	\$303,345	\$313,962	\$324,951	\$1,584,528
Farebox Revenues Projection - Method B (based on projected ridership)							
Membership Revenues ²	\$233,337	\$350,005	\$466,674	\$466,674	\$466,674	\$466,674	\$2,450,038
Usage Fee Revenues ³	\$16,661	\$24,991	\$33,322	\$33,322	\$33,322	\$33,322	\$174,940
OPERATING REVENUES TOTAL (using Method B)	\$249,998	\$374,997	\$499,996	\$499,996	\$499,996	\$499,996	\$2,624,978
OPERATING COST RECOVERY (Net Gain or Loss)	\$ (198,602)	\$ (230,892)	\$ (273,643)	\$ (300,720)	\$ (328,745)	\$ (357,751)	\$ (1,690,354)

Notes

1. Assumes flat 50% cost recovery.
2. Assumes no increase in membership without addition of new stations.
3. Assumes no increase in trips without addition of new stations.

Flexible Station: Replacement Schedule

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Station Replacement Schedule						
Total Number of Stations (End of Year)	29	43	57	57	57	57
Number of Expansion Stations	29	14	14	0	0	0
State of Good Repair (SGR) Replaced Stations	0	0	0	0	0	0
Total Number of New Stations	29	14	14	0	0	0
1 year old stations		29	14	14	0	0
2 year old stations			29	14	14	0
3 year old stations				29	14	14
4 year old stations					29	14
5 year old stations						29
6 year old stations						
7 year old stations						
8 year old stations						
9 year old stations						
Stations to replace due to end of useful life						
Bicycle Replacement Schedule						
Bicycles in service (Start of Year)	0	285	428	570	570	570
Expansion Bicycles in service	285	143	143	0	0	0
Total Bicycles in service	285	428	570	570	570	570
Bicycles replaced due to theft or vandalism	3	4	6	6	6	6
SGR Replaced Bicycles						
Total New Bicycles (Expansion and Replaced)	288	147	148	6	6	6
1 year old bicycles		285	145	147	6	6
2 year old bicycles			282	144	145	6
3 year old bicycles				279	142	144
4 year old bicycles					277	141
5 year old bicycles						274
Bicycles to replace due to end of useful life	0	0	0	0	0	274
Bicycle Price	\$1,300	\$ 1,365	\$ 1,433	\$ 1,505	\$ 1,580	\$ 1,659
Cost of bicycles replaced due to theft or vandalism	\$3,705	\$ 5,835	\$ 8,170	\$ 8,578	\$ 9,007	\$ 9,457
Cost of bicycles replaced due to expiration of useful life		\$ -	\$ -	\$ -	\$ -	\$454,184
Annual parts replacement per new bicycle (failure and minor vandalism)	\$ 120	\$ 126	\$ 132	\$ 138	\$ 145	\$ 153
Average age of fleet at year end (multiplier reflecting increased parts failure for older bikes)		0.67	1.24	2.23	3.21	4.18
Parts replacement cost (assuming 25% of fleet requires it annually)		\$ 8,945	\$ 23,385	\$ 44,029	\$ 66,473	\$ 90,837
Total	\$ -	\$ 8,945	\$23,385	\$44,029	\$66,473	\$545,021

Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
57	57	57	57	57	57	57	57	57
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	29	14	14
0	0	0	0	0	0	29	14	14
0	0	0	0	0	0	0	29	14
0	0	0	0	0	0	0	0	29
0	0	0	0	0	0	0	0	29
14	0	0	0	0	0	0	0	0
14	14	0	0	0	0	0	0	0
29	14	14	0	0	0	0	0	0
	29	14	14	0	0	0	0	0
		29	14	14	0	0	0	0
			29	14	14	0	0	0
				29	14	14	0	0
570	570	570	570	570	570	570	570	570
0	0	0	0	0	0	0	0	0
570	570	570	570	570	570	570	570	570
6	6	6	6	6	6	6	6	6
274	140	141	5	5	5	266	138	139
279	145	147	11	11	11	271	144	145
6	277	144	145	11	11	11	269	142
6	6	274	142	144	11	11	11	266
6	6	6	271	141	142	11	11	11
142	5	5	5	268	140	141	11	11
140	141	5	5	5	266	138	139	11
140	141	5	5	5	266	138	139	11
\$ 1,742	\$ 1,829	\$ 1,921	\$ 2,017	\$ 2,118	\$ 2,223	\$ 2,335	\$ 2,451	\$ 2,574
\$ 9,930	\$ 10,427	\$10,948	\$11,495	\$ 12,070	\$ 12,674	\$ 13,307	\$ 13,973	\$ 14,671
\$243,168	\$257,806	\$10,411	\$10,932	\$11,479	\$590,873	\$322,553	\$341,840	\$27,221
\$ 160	\$ 168	\$ 177	\$ 185	\$ 195	\$ 205	\$ 215	\$ 225	\$ 237
2.28	1.81	1.33	2.27	3.20	4.12	2.31	1.86	1.41
\$ 52,108	\$ 43,367	\$33,442	\$59,934	\$ 88,727	\$ 119,977	\$ 70,832	\$ 59,913	\$ 47,497
\$295,277	\$301,173	\$43,854	\$70,866	\$100,206	\$710,850	\$393,385	\$401,753	\$74,718

Policy and Regulatory Review

Survey of policies and regulations that could influence bike share implementation

Policies and regulations guide day-to-day decision making about public and private elements of a community. How are streets designed and maintained? How does a local government manage and approve private development or businesses? The answers to these types of questions are guided by policies and regulations that have been adopted by local governments and other public agencies.

This chapter provides a surface-level scan of the local policies and regulations that could guide decision making about a bike share system in Atlanta and Decatur. Because bike share systems are dynamic in terms of their service and operations, they are influenced by a variety of local policies and regulations. Additionally, because bike share is a new technology and transit service that has not yet been launched at the city scale in Atlanta and Decatur, new policies and regulations will likely need to be created and adopted to guide the implementation and operation of a bike share system.



Site Design

For the purpose of this study, site design refers to the physical location of bike share bikes, stations and their related infrastructure. Siting bike share stations is critical to the overall success of a system. Bikes need to be publicly accessible and visible, which means they need to be located within the public right-of-way or on private property that is publicly accessible.

The sections that follow summarize what entity or owners are responsible for the management of public and private spaces that are typically used for bike share systems. This section also highlights policies and regulations that may need to be modified or created to effectively manage the siting of bike share infrastructure.

Public Right-of-Way

Public right-of-way (ROW) is property owned by local, state or federal governments that creates access to private property or utility or transportation services. Some examples include streets, public property, parks and utility easements. The value of public ROW is that it affords people the ability to access destinations in the community.

In Atlanta, the Department of Public Works is the primary department responsible for the maintenance and management of the city's ROW. Within the department, the Office of Transportation would permit stations located in the ROW. Other departments that would likely have a significant role with site design include the Department of Planning and Community Development and the Department of Parks, Recreation and Cultural Affairs.

In terms of the maintenance, use and construction of public ROW, the primary document guiding decision-making is the *City of Atlanta Public Right-of-Way Manual*. The policy manual addresses permitting, construction and commercial activity within the public ROW among other items. In terms of regulation, Chapter 138: Streets, Sidewalks and Other Public Spaces is the primary city code addressing the maintenance and use of public ROW.

Street design policy and regulations may also influence and guide decision-making related to bike share station design and location. In terms of policy, the Livable Street Design Guide, which is a component of the adopted Connect Atlanta Plan, the city's comprehensive transportation plan, provides some guidance for street design and location of utilities within the public ROW.

The City of Atlanta land development ordinance, which includes zoning, may also provide guidance related to siting bike share stations. While zoning primarily addresses the design of private property, it can also address the design and management of the space where public and private property connect. Most often this is in the form of design requirements for sidewalk and streetscape elements along the public frontage of private property. The implementation of these policies and regulations is a coordinated effort between the Department of Public Works and the Department of Planning and Community Development.

In Decatur, the Engineering Department is the primary department responsible for the construction, maintenance and management of the public ROW. Other departments that would likely have a significant role with site design include the Public Works Department and the Planning, Zoning and Inspections Department.

Within Decatur, the treatment of public ROW is primarily guided by Chapter 6: Streets, Sidewalks and Other Public Spaces. Just as in Atlanta, this chapter of the city code of ordinances will likely need to be updated to guide decision-making about the placement and operation of bike share systems in the public ROW.

Decatur has also adopted the City of Decatur Bicycle Parking Guidelines. These guidelines are the city's policy document guiding the type and location of bicycle parking in the public ROW and private property. While it does not address the location of bike share stations, it is instructive as a starting point for bike share site design. It is also a document that could be amended to include a section describing the requirements for placement of bike share stations.

As is the case for Atlanta, the zoning regulations for Decatur may also influence and guide decision making related to bike share in the public ROW. Appendix A: Zoning is the applicable code section that addresses zoning and is primarily administered by the Planning, Zoning and Inspections Department. Decatur is also similar to Atlanta in that the implementation of these requirements for private property is a coordinated effort between the Planning, Zoning and Inspections Department and the Engineering Department.

Public Space

Public space, such as parks, can be a great location for bike share stations. In Atlanta, the Department of Parks, Recreation and Cultural Affairs is responsible for the design, construction, maintenance and operations of parks in Atlanta. Additionally, Chapter 11.0: Parks and Recreation of the city code addresses the regulation of city parks.

In Decatur, the management parks and public spaces is shared by the Public Works Department, the Active Living Department and the Engineering Department. Public Works and Engineering are responsible for the design, construction and maintenance of public parks. Active Living is responsible for the operations, programming and strategic planning for parks.

For Atlanta and Decatur, these respective departments will be the likely government departments responsible for approving and coordinating the location of bike share stations in public parks.

Privately-Owned Public Space and Private Property

Bike share stations can be located on publicly-accessible private property. This type of public space, which is often referred to as privately-owned public space (POPS), most often takes the form of plazas, pocket parks or parking lots. These spaces are typically on private property and within the setback area between the property line and the entrance to a building.

Because of their visibility and public access, they can be desirable locations for bike share stations. However, these spaces require approval of the property owners to locate the stations on their property.

In most cases, these spaces are governed by zoning regulations and other local requirements for private property. They may have additional requirements for design and location of bike share stations. This is particularly true for state and federal buildings which often have design requirements associated with universal access and safety considerations.

Privately-owned public spaces can be owned by a variety of government agencies, quasi-government owners and private property owners. Examples of other government owners of POPS include Fulton County and state and federal government departments. Examples of quasi-government owners include MARTA and some development authorities. With all of these entities, planning and coordination will be required to ensure all local, state and federal site design requirements are satisfied.

Signage

Signage is an important part of any bike share system. It can be used help customers identify and locate stations, either to check out or return a bike. Many bike share stations also include maps and instructions to explain how to use the system or where other stations are located near-by. Also depending on the type of operational model, bike share stations and bikes may include advertising signage. Because signage is such a critical component of bike share operation, the signage needed to successfully operate a system needs to be allowed.

In Atlanta, Chapter 28A: Signage addresses all signs in the City of Atlanta on public and private property. The ordinance addresses the size, placement, construction and permitting of signs. This section of the code may be an appropriate place to address bike share signage, such as kiosks and maps.

Additionally, Part 4 Section 5 of the *City's Public Right-of-Way Manual* addresses commercial activity and signage in the public ROW. It notes that commercial signage is not allowed in the public right-of-way except where noted in City Code Section 138-13. This section of the code may also be an appropriate place to address bike share signage, at least as it relates to signage in the public ROW.

In Decatur, signs are regulated under Chapter 78: Signs. As in Atlanta, this code addresses all signs on public and private property. It addresses items such as permitting, signage on public property, general requirements, sign exemptions and permitting. Also similar to Atlanta, this section of the Decatur code may be an appropriate place to address bike share signage.

Operations and Maintenance

Bike share systems require unique agreements and permits because of their operational requirements. Bike share is a type of public transportation, so it needs to be publicly accessible and operate on publicly owned land, which includes streets and public property such as parks or privately-owned public space.

Additionally, most bike share systems are run by private companies or non-profit organizations. Because of the public and private nature of bike share systems, they most often require public-private partnerships for implementation.

Because Atlanta and Decatur do not currently have a bike share system operating on public property, there are no procedures, policies or regulations in place to manage a system. However, there are policy, licensing, permitting and contractual precedents for commercial operations in public right-of-way and on public property. These precedents can be instructive and used as a starting point to guide the development of policies and regulations that address the operations and maintenance requirements for a bike share system.

Contracts and Licensing

Regardless of the type of operational model selected for a bike share system, they require some form of contract between a local government or authority and a vendor and/or operator to operate. A vendor, for the purpose of bike sharing, is a company that makes the bikes and associated infrastructure for a system. An operator is a company that manages the operations and maintenance of a bike share system. Since local governments or authorities are typically not in the business of bicycle production or do not have experience operating bike share systems, they often elect to contract this work out.

If a local government or authority does not want to operate and maintain a bike share system, it will also need to contract with an operator. For this type of arrangement, the city or contracting authority will need to decide the degree of control afforded a business to operate on public right-of-way and public property. Additionally, because the City of Atlanta and Decatur own the majority of public right-of-way and public property that a bike share system would use to operate, it is likely that any contracting will be handled by the respective local government.

In Atlanta, the contract process is managed by several departments including the Department of Procurement and Department of Finance as well as the department responsible for a particular contract. The typical process starts with Procurement issuing a solicitation for bids on a particular contract. Procurement works with whatever department will be managing the contract to select the best bidder. Once a bidder is selected and a contract is signed, the managing department works with the Finance Department to administer the contract. The managing department oversees the fulfilment of the terms of the contract. The Finance Department manages the financial obligations associated with the contract which typically include receiving and issuing payments for services, accounting, etc.

In Decatur, the City Manager's Office, the Administrative Services Department and the department responsible for a particular contract manage the contract process. The City Manager's Office is responsible for soliciting bids for a contract. The office works with whatever department will be managing the contract to select the best bidder. Once a bidder is selected and a contract is signed, the managing department works with the Administrative Services Department to administer the contract. Similar to Atlanta, the managing department oversees the fulfilment of the terms of the contract and Administrative Services manages the financial obligations and performance of the contract.

In addition to contracting, occupational tax licenses, or business licenses, may be required for a bike share system to operate in Atlanta and Decatur. In Atlanta, the Department of Finance - Office of Revenue is responsible for issuing business licenses. In Decatur, the Revenue Division is responsible for issuing business licenses.

Permitting

Obtaining the appropriate permits for a bike share system is an important part of launching and operating any bike share system. For local governments, permits are a way to manage the activity that takes place on public and private property. They are also issued to ensure that whatever activity is being approved is done safely and protects public and private interests.

Permits for bike share system are typically issued to address several operation conditions including:

- Operation of commercial business in public right-of-way, on public property or on private property.
- Location of bike share stations and associated infrastructure in the public right-of-way, public property or private property.
- Manage liability
- Manage financial performance of services being provided

Since Atlanta and Decatur currently do not have a bike share system that operates on public property or in the public right-of-way, there are no procedures or permitting processes in place. However, there are several permitting programs and procedures in place that can provide guidance for permitting process. They include the following:

- Vending on Public Property in City of Atlanta
- Vending on Private Property in City of Atlanta
- ParkAtlanta

Components of these programs could be used to develop a program that is specific and tailored for the goals of a bike share program.

Transit

The success of bike sharing in Atlanta will be tied to its integration with MARTA transit service. This integration includes convenient access and visibility at MARTA stations, convenient location near select bus stops, and the continued allowance of bikes on buses and trains.

In terms of current MARTA policies for bicycles, they are allowed on trains at any time of the day and night. Additionally, MARTA has installed bicycle racks on all buses. These policies encourage bicycle use with transit service by improving bicycle mobility at the beginning or end of a transit ride. MARTA also provides bicycle parking at stations, but there is not a formal program or policy guiding their location and maintenance.

Beyond bicycle policies, two other MARTA policies and programs that may impact bike share are its advertising policy and its vending program. In terms of advertising, MARTA has adopted policies and regulations that address commercial, transit advocacy, and community, education or health and safety advertising. To manage advertising on MARTA property, MARTA has a contract with CBS Outdoor.

Regardless of the operational model, any bike share system that is located on MARTA property will have to adhere to its advertising policy. Additionally, if a bike share system is run by a private operator, it may need to coordinate with CBS Outdoor in order to locate signage associated with a bike share station. These questions and others associated with advertising and the terms of the CBS Outdoor contract will need to be examined to address any conflicts.

The other policy and program that may influence or be instructive with the location of a bike share station on MARTA property is the MARTA vending machine program. In 2010, the State of Georgia lifted the ban on food and drink on MARTA property. This change in law allowed MARTA to create a food and beverage vending program. Currently, MARTA has a contract with Gilly Vending Inc. to install, maintain and operate vending machines at all MARTA stations. The terms of the contract may provide a base line or starting point to guide the placement, operation and maintenance of a bike share station at a MARTA station.

City Policies and Plans

City planning and decision-making in Atlanta and Decatur are guided by elected officials, city staff, government-organized committees and the greater community. To inform and guide decision-making about the community, particularly as it relates to transportation and community design, adopted plans and other documents guide discussions.

The sections that follow highlight the decision-making bodies, programs and plans that could likely impact bike share implementation. The sections are by no means exhaustive or definitive, but are rather starting points to develop next steps for bike share implementation.

Governance

In Atlanta, policy, planning and project implementation is guided by the Mayor, City Council and departments. The Mayor oversees city policy, strategic planning and operations for Atlanta and serves as the executive for the city. To guide decision-making and policy development, the Mayor's Office includes several offices that assist with policy development and project prioritization. The offices most likely to assist with bike share include the Offices of Chief Operating Officer, Chief of Staff and Sustainability.

The Mayor's Office can also create programs or initiatives under the direction of the office, such as the Atlanta Street Car initiative. The implementation of these initiatives is shared by other Offices within the Mayor's Office, City Council and city departments. Bike share could become a program or initiative within the Mayor's Office.

The Atlanta City Council has the authority and responsibility of adopting city legislation and policy. This responsibility includes adopting any plans and approving funding for projects. To guide policy and legislative development, the council has several committees that review and develop legislation, planning documents, and projects. The purpose of the committees is to provide recommendations to city council and the Mayor on legislation, plan approval and project approval.

Supporting both the Mayor and City Council are city departments. The departments provide technical assistance and carry out the day-to-day responsibilities of providing city services. For bike sharing, the Department of Planning and Community Development, Department of Public Works and Department of Parks, Recreation and Cultural Affairs will likely have the most involvement with planning and implementation.

In Decatur, policy, planning and project implementation is guided by the City Commission, City Manager, departments and residential boards and commissions. The City Commission sets the policy agenda and long-term strategic goals for the City. Additionally, the City Commission has the responsibility and authority of approving legislation, adopting plans and policies and approving projects among others.

The City Manager is the primary policy advisor to the City Commission and provides technical assistance by overseeing day-to-day operation of the government. The City Manager is supported by several assistant city managers as well as departments. From the City Manager's office, the assistant city managers who would likely have the most involvement with bike share include the Assistant City Manager Community and Economic Development Services and Assistant City Manager Public Works Services.

Any legislation, financial investment or policy development associated with bike share will likely be led by these decision-making bodies with assistance from departments, their staff and the community. The table on the following page provides an overview of the different decision-making bodies for each city and responsible parties that could be assigned responsibility for bike share planning and implementation.

Transportation and Community Design Decision-Making Bodies

Decision-Making Body	Responsible Parties
Atlanta	
Transportation	
Mayors Office	Mayor; Office of Chief Operating Officer; Office of Chief of Staff and Sustainability; Office of Sustainability; Projects and Initiatives
City Council	Council members; Transportation Committee
Departments	Public Works; Planning and Community Development
Commissions	Atlanta Urban Design Commission
Community Design	
Mayor's Office	Mayor; Office of Chief Operating Officer; Chief of Staff and Sustainability; Office of Sustainability; Projects and Initiatives
City Council	Council members; Community Development/Human Resources Committee; Zoning Committee
Departments	Planning and Community Development; Parks, Recreation and Cultural Affairs
Commissions	Atlanta Urban Design Commission
Decatur	
Transportation	
City Commission	Commissioners
City Manager's Office	City Manager; Assistant City Manager Community & Economic Development Services; Assistant City Manager Public Works Services
Departments	Active Living; Planning, Zoning and Inspections; Public Works; Engineering
Residential Boards and Commissions	Active Living Board; Environmental Sustainability Board
Community Design	
City Commission	Commissioners
City Manager's Office	City Manager; Assistant City Manager Community & Economic Development Services; Assistant City Manager Public Works Services
Departments	Active Living; Planning, Zoning and Inspections; Codes Enforcement
Residential Boards and Commissions	Active Living Board; Environmental Sustainability Board; Decatur Downtown Development Authority; Planning Commission

Transportation

The sections below summarize the responsible parties involved with transportation planning and project implementation in Atlanta and Decatur. Additionally, the table on the following page provides an overview of policy and planning documents that could provide guidance during bike share planning and implementation.

Atlanta

Transportation policy and project implementation is primarily managed and implemented by the Department of Public Works and the Department of Community Planning and Community Development. The Department of Parks, Recreation and Cultural Affairs also provides support for transportation planning as it relates to multi-use trails and connections to parks. Policy direction and support can come from the Mayor's Office, City Council members and City Council committees.

In terms of policy documents, the *Connect Atlanta Plan* is the comprehensive transportation plan (CTP) and the *City's Public Right-of-Way Manual* are two of the most important. The Connect Atlanta Plan establishes overall transportation goals and policies for the cities. It also prioritizes projects for transportation maintenance and capital improvements. The *City's Public Right-of-Way Manual* sets standards and guidelines for managing the city's public space and right-of-way. Any bike share system operating in public ROW will be guided by the manual and applicable city codes.

Bike share implementation could also find guidance on planning and project implementation within neighborhood and small area plans. These include Livable Centers Initiative (LCI) plans, which are small area plans funded partly by the Atlanta Regional Commission. The plans make areas eligible for special transportation funding from the ARC.

Decatur

In Decatur, transportation policy and project implementation are primarily managed and implemented by the Planning, Zoning and Inspections Department and the Engineering Department. Policy direction and support can come from the City Commission and City Manager.

In terms of policy documents, the 2010 Strategic Plan, Comprehensive Transportation Plan and the Environmental Sustainability Plan provide the most important guidance for bike share in terms of goals and policies. They establish the long-range vision for the city and help the city prioritize transportation project funding.

Decatur has also completed several small area studies, including some LCI plans. Like Atlanta, these plans can guide bike share planning with guidance on transportation goals, such as making Decatur more bikable and accessible by public transportation. They can also be a source for transportation projects that could help implement bike share, such as bike lanes or other bicycle infrastructure.

Community Design

The sections below summarize the responsible parties involved with community design, which includes land use, community development and parks and recreation. Additionally, the table below provides an overview of policy and planning documents that documents that could provide guidance during bike share planning and implementation.

Atlanta

In Atlanta, community design policy and implementation are primarily managed by the Department of Planning and Community Development and the Department of Parks, Recreation and Cultural Affairs. Additionally, the Atlanta Urban Design Commission is responsible for reviewing public development project and projects within the city's right-of-way.

In terms of policy documents, the *2011 Comprehensive Development Plan (CDP)*, the *Capital Improvement Plan (CIP)* and *Project Greenspace* are the most important documents. They provide policy guidance related to urban design, parks and recreation, land use and transportation. Additionally, they are used to prioritize capital improvement projects such as streetscape and parks projects.

Similarly, Atlanta has many neighborhood and small areas plans that can provide policy guidance and support bike sharing planning and implementation. These plans can be used to help guide bike share planning requirements such as station location as well as supporting bicycle facilities such as bike lanes.

Plans and Policy Documents

Document Type	Documents
Atlanta	
City-wide	2011 Comprehensive Development Plan (CDP) Connect Atlanta Plan (comprehensive transportation plan or CTP) Project Greenspace Capital Improvement Plan (CIP) City's Public Right-of-Way Manual Impact Fee Study
Neighborhood/Small Area	LCI plans Neighborhood and small area plans Corridor studies Redevelopment plans
Decatur	
City-wide	2010 Strategic Plan Community Transportation Plan 2005 Comprehensive Plan Update Environmental Sustainability Plan Decatur Bicycle Parking Guidelines
Neighborhood/Small Area	2005 MARTA Plaza Redevelopment Plan Avondale LCI Master Plan Decatur Town Center Plan Decatur Greenway Plan

Decatur

In Decatur, community design policy and implementation are primarily managed by the Planning, Zoning and Inspection Department. The Department is assisted by other departments including Active Living; Planning, Zoning and Inspections; Public Works; Engineering.

In terms of policy documents, the 2010 Strategic Plan, 2005 Comprehensive Plan Update and the Environmental Sustainability Plan are the most important documents. They provide policy guidance related to urban design, parks and recreation, land use and transportation.

Similarly, Decatur has several small areas plans that can provide policy guidance and support bike sharing planning and implementation. These plans can be used to help guide bike share planning requirements such as station location as well as supporting bicycle facilities such as bike lanes.

Bicycle Parking

Currently in Atlanta and Decatur, bicycles are allowed to be parked along the street or sidewalk as long as they do not obstruct pedestrian traffic. These code requirements should be revisited during bike share planning to ensure bike share can operate effectively and legally.

Under Chapter 150-209: Parking, the following is required in Atlanta:

- No person shall park a bicycle upon a street other than upon the roadway against the curb or upon the sidewalk in a rack to support the bicycle or against a building or at a curb, in such manner as to afford the least obstruction of pedestrian traffic.

Under Chapter 19-14: Bicycles-Parking, the following is required in Decatur:

- No person shall park a bicycle upon a street other than upon the roadway against the curb or upon the sidewalk in a rack to support the bicycle or against a building or at a curb, in such manner as to afford the least obstruction to pedestrian traffic.

Riding a bike on sidewalks

In Georgia, state law allows those under the age of 12 to legally ride on sidewalks, except where a local ordinance or resolution allows otherwise. The law was passed in 2009 as Senate Bill 196, and is now 40-6-144 of the Georgia Code. The code reads as follows:

- Except as provided by resolution or ordinance of a local government for sidewalks within the jurisdiction of such local government authorizing the operation of bicycles on sidewalks by persons 12 years of age or younger, no person shall drive any vehicle upon a sidewalk or sidewalk area except upon a permanent or duly authorized driveway.

Currently in Atlanta and Decatur, riding a bike on the sidewalk is allowed in some areas. In both cities, riding on the sidewalk is legal as long as people are courteous and respectful of pedestrians.

In Atlanta, there are some additional requirements related to riding on a sidewalk. No person over the age of 13 is allowed to ride on a sidewalk. Since bike share trips often begin or end on a sidewalk and because people using bike share will be over the age of 13, this law will need to be changed.

There is also ambiguity about riding on sidewalk in certain districts. The laws below mention a 'business district' and 'central traffic district.' Business district is not defined and central traffic district is loosely defined, covering portions of Midtown and Downtown. This language should be changed to provide clarity and ensure people using bike share are not violating a law by doing so.

Under Chapter 150-5: Bicycles and Play Vehicles of the City of Atlanta code of ordinances, riding a bicycle on a sidewalk is governed by the following regulations:

- Business district - No person shall ride a bicycle upon a sidewalk within a business district or the central traffic district.
- Age restriction - No person 13 or more years of age shall ride a bicycle upon any sidewalk in any district.
- Duties to pedestrians - Any person who is riding a bicycle upon a sidewalk shall yield the right-of-way to any pedestrian.

Under Chapter 98-14: Bicycle-Riding on the Sidewalk, the following is required:

- Whenever any person is riding a bicycle upon a sidewalk, such person shall yield the right-of-way to any pedestrian and shall give an audible signal before overtaking and passing such pedestrian.

Regional Policies and Plans

Regional policies and plans help guide local policy and regulation development and help with intergovernmental coordination. Additionally, many of the policies tie federal transportation money to local implementation. If local projects show they support regional policies, they can become eligible for funding from several state and federal programs. For this study, regional policies and plans were scanned to identify language that is supportive of the services and impacts bike share systems are designed to address: improve bicycle mobility, enhance access to transit and other daily destinations, reduce congestion, improve air quality and improve public health.

In the Atlanta Metro region, the Atlanta Regional Commission is charged with coordinating transportation investments, coordinating local planning and providing support for federal and state planning requirements. Specifically, ARC is tasked with the following responsibilities:

- ARC is responsible for comprehensive planning under state law as the designated Metropolitan Planning and Development Commission (MAPDC)
- As an area greater than 1,000,000 population, ARC is also defined as a Regional Commission (RC) to assist local governments with the planning process and to prepare and to implement comprehensive regional plans.
- ARC is the federally designated Metropolitan Planning Organization (MPO) for Atlanta region. As the MPO, ARC is responsible for developing a multi-modal, financially constrained transportation plan that meets all federal transportation and Clean Air Act planning requirements.
- ARC provides planning staff to the Metropolitan North Georgia Water Planning District (MNGWPD), whose mission is to develop comprehensive regional and watershed-specific water resource plans for implementation by local governments.
- ARC serves as the administrative agency for the Atlanta Regional Workforce Board (ARWB).
- ARC serves as the Area Agency on Aging (AAA) by providing services and policy guidance to address aging issues.

To meet these requirements, ARC has a governing board, committees, programs and plans that guide regional and local decision making about transportation, land use and community development, economic development, environment and local government coordination.

Specifically related to bike share, the sections on the following pages summarize the committees, programs and plans managed by ARC that will likely play a role in bike share planning and implementation. Potential ARC responsibilities for bike share include funding opportunities and technical assistance.

ARC Committees

Regional policy and decision making is guided by several committees at ARC. These committees have the responsibility of adopting regional policies and procedures, particularly as they relate to federal and state planning requirements, technical assistance for ARC board and regional leadership as it relates to local planning and coordination. Below is a summary of the committees that could play a role in bike share implementation.

- **Transportation and Air Quality Committee (TAQC)** - Sets regional transportation policy and receives technical advice and support from the Transportation Coordinating Committee. It also provides coordinating assistance between MARTA, GDOT, GA EPD and GRTA. The committee could support bike share by providing regional policy support for bike share and coordination assistance between agencies.
- **Regional Transit Committee (RTC)** - Sets regional transit policy for the Atlanta Region and provides coordinating assistance for the regional transit agencies, such as MARTA, GRTA, CCT, GCT, CATS, Hall Area Transit and GDOT. The committee could support bike share by providing regional policy support for bike share and coordination assistance between agencies.
- **Environment and Land Use Committee (ELUC)** - Oversees work programs and activities of ARC's Land Use, Research and Environment Divisions and sets regional land use policy. Additionally, ELUC guides the Livable Communities Initiative (LCI) and Development of Regional Impact (DRI) programs. The committee could support bike share by providing regional policy support for bike share and funding support through the LCI program.
- **Transportation Coordinating Committee (TCC)** - Provides technical assistance for TAQC related to regional transportation planning and multi-jurisdictional transportation planning. The committee could support bike share by providing technical guidance for bike share to the TAQC, MARTA and representatives from Atlanta and Decatur.
- **Land Use Coordinating Committee (LUCC)** - Provides technical assistance for the Environment and Land Use Committee (ELUC). The committee could support bike share by providing technical guidance for bike share to the ELUC, particularly as it relates to the LCI program.
- **Bicycle and Pedestrian Task Force** - As a subcommittee of the Transportation Coordinating Committee (TCC), the task force provides technical assistance and policy guidance for the implementation of the regional bicycle and pedestrian plan as well as policy guidance for local jurisdictions on bicycle and pedestrian planning. The committee could support bike share by providing technical guidance for bike share to the TCC, MARTA, representatives of Atlanta and Decatur, and others involved with bike share planning and implementation.

Programs

ARC manages several programs that could support bike share. Support could include funding for bike share capital costs, transportation infrastructure improvements and subsidies for bike share membership. Below is a summary of the programs that could play a role in bike share implementation.

- **Transportation Improvement Program (TIP)** - Allocates federal funds for use in construction of the highest-priority transportation projects identified in the Regional Transportation Plan (RTP). Under federal requirements, the TIP must be consistent with the long-range objectives of the RTP and must be financially balanced. Bike share could qualify for funding under this program or be funded by a project already developed in the RTP.
- **Livable Centers Initiative (LCI)** - Planning program that links community planning with transportation planning and infrastructure improvements. The LCI program receives planning and implementation funds from the L230 Surface Transportation Program - Urban (STPU) federal funding program. LCI funding could be used to fund additional bike share planning or implementation.
- **Transportation Demand Management (TDM) Division** - The TDM division provides technical assistance and financial support for Employer Service Organizations (ESOs), which help workers in the region find alternative commute options. RideSmart is the umbrella program that covers TDM and ESO support in the Atlanta region, with funding and technical assistance from GDOT and FHWA. RideSmart receives its funding through GDOT using federal Congestion Mitigation and Air Quality (CMAQ) funds. ESOs can provide subsidies for transit or alternative commuting. Bike share membership could be supported through the TDM division and regional ESOs.

Plans

Regional plans adopted by ARC provide guidance related to a variety of decisions including transportation funding, community development and environmental stewardship. While ARC focuses on a wide-range of services, the following plans are the most important for bike share implementation.

- **PLAN 2040** - Primary regional policy document for ARC. The plan guides all activities at ARC, including state and federal planning requirements. The Regional Transportation Plan is a component of PLAN 2040. Bike share supports many of the goals, policies, objectives, programs and projects identified in the plan. For bike share, the PLAN 2040 can be used to support transportation funding decisions, policy support and technical guidance.
- **Regional Transportation Plan (RTP)** - Primary regional policy document for transportation planning and funding for the Atlanta region. It is also a component of PLAN 2040. The plan supports the Transportation Improvement Program (TIP) by providing technical policy information and planning guidance for transportation project funding. For bike share, the RTP can be used to support regional policy development for bike share and transportation funding decisions.
- **2007 Atlanta Region Bicycle Transportation & Pedestrian Walkways Plan** - Focused on regional policy and goals for bicycle and pedestrian planning and projects. The plan is used to guide funding decisions for bicycle and pedestrian projects selected for the TIP and for local governments to prioritize bicycle and pedestrian initiatives. For bike share, the plan can be used to support regional policy development for bike share and related transportation funding decisions.

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Recommendations

Next steps and implementation strategies

In order for bike share to be launched successfully, a variety of items need to be addressed. These items include how and where to launch initial phases, site design considerations, policy and regulation changes, vendor and operator selection, and community input about their opinions and attitudes about bike share. Additionally, there needs to be a process established to coordinate planning. The process should include a community conversation about what bike share is, what the goals for bike sharing are and how it can work best in Atlanta and Decatur.



Program Scale and Extent

Based on the community suitability and demand analysis, it is recommended that initial bike share implementation focus on the three phase 1 service areas. These three service areas cover the Atlanta Core (Midtown/Downtown/West End), portions of Buckhead and Downtown Decatur. In total, these three service areas cover 14.1 square miles, or 15% of the total area of Atlanta and Decatur.

As mentioned in the Community Suitability Chapter, 1 in 2 people 18-64 in Atlanta and Decatur live within the phase 1 service areas. Similarly, 1 in 4 employees in Atlanta and Decatur live within the phase 1 service areas. Combined with the understanding that these areas are also the most bikeable areas of both cities, they are the most practical areas to focus initial bike share efforts.

In addition to the phase 1 service areas, a secondary market service area was identified. This area was identified because it is currently somewhat suitable for bike share, but the land use and transportation policies currently in place support the type of development and transportation infrastructure that is ideal for bike sharing. Example areas include areas along the Atlanta BeltLine, where policies, regulations and transportation projects support a redevelopment strategy with walkable and bikeable mixed-use development connected by transit service and multi-use paths.

The secondary market service area also represents the goal to eventually create a contiguous service area. As the density of destinations increases in the long-term expansion areas and transit service is expanded to these areas, bike share can become a viable transportation service.

In terms of bike share system size, it is recommended that the first phase include approximately 570 bikes and 57 stations. By service area, the following is recommended:

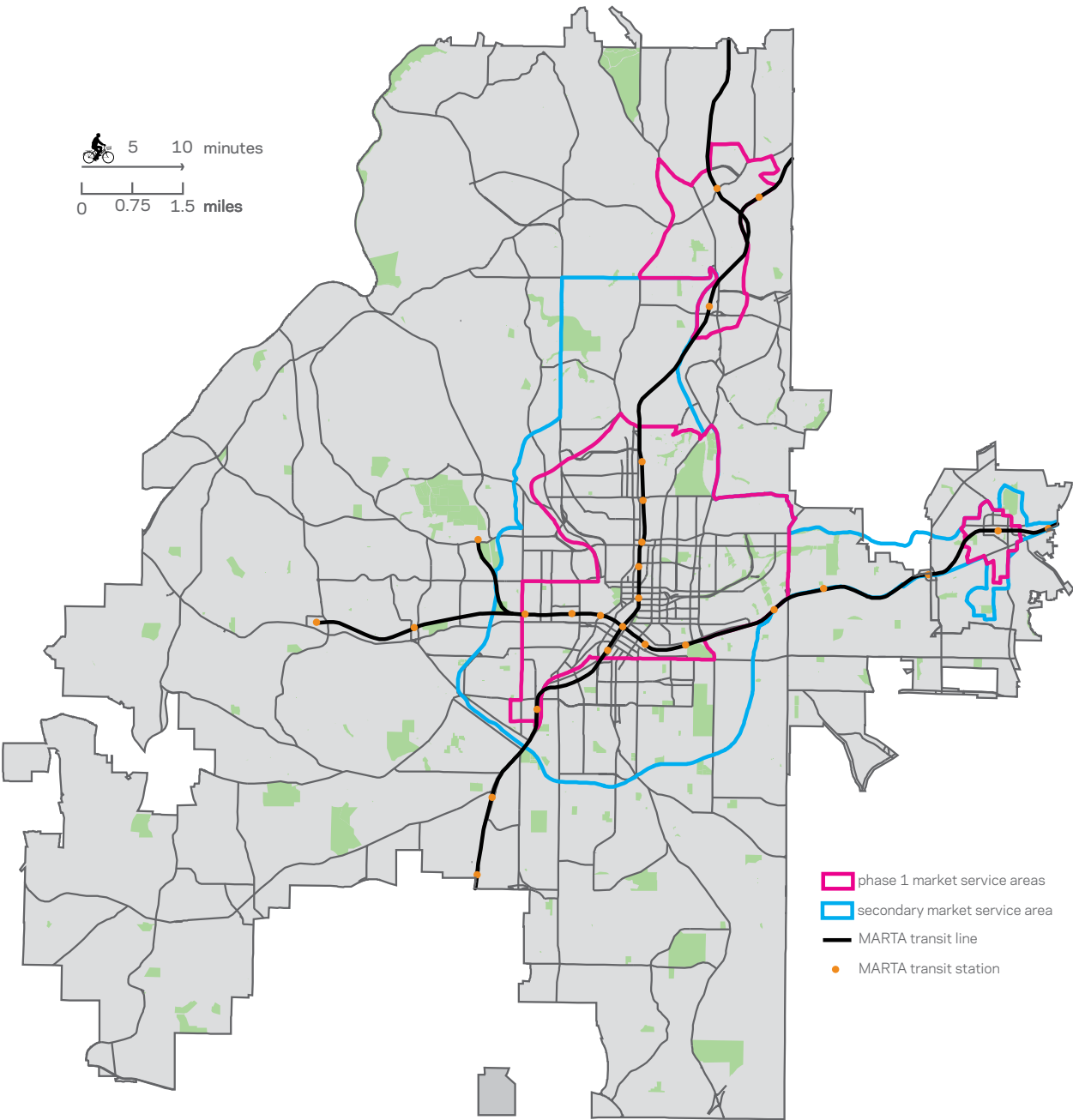
- Buckhead phase 1 service area - 108 bikes and 11 stations
- Atlanta Core (Midtown/Downtown/West End) phase 1 service area - 432 bikes and 43 stations
- Downtown Decatur phase 1 service area - 30 bikes and 3 stations

It should be noted that these are preliminary planning numbers and do not incorporate any market studies or research on user demand. Additional research may identify additional demand not captured with this study. As such, the number of bikes and stations may vary with future analysis. The recommended system metrics developed with this study should be used to refine future analysis and judge future bike share proposals.

Decatur, in particular, could use additional analysis. Because of the nature of the modeling techniques used and scale of geographic data, the analysis may not have captured all of the demand for bike share. With additional analysis, demand for additional stations and bikes could be identified.

With any approach and future analysis, the main question to address is whether there are enough destinations within a 5-10 minute bike ride that can make bike share viable. Additionally, most systems need a minimum station density for systems to operate successfully and meaningfully.

Recommended Service Areas



Financing Bike Share

In terms of financial requirements for bike share in Atlanta and Decatur, it is estimated that the six year capital costs will range from \$1.6 to \$3.7 million and that six year operational costs will range from \$4.3 to \$9.2 million. These numbers are based on the estimated number of bikes and stations developed for the phase 1 service areas. Additionally, the range in costs is associated with the differences between the projected capital and operational costs associated with a flexible station and fixed station bike share system.

It should be noted that these are initial estimates and should be used to guide future decision making about the size and density of a bike share system in Atlanta and Decatur. Many of the peer bike share systems surveyed have not fully matured and they still do not know their true build-out and market saturation. Most systems expand only to the extent that funding is available. The exact cost will range significantly based on the type of operational model selected as well as the vendor and operator selected.

As part of future planning, the need for capital investments and revenue sources should be explored. Some systems, such as DecoBike in Miami, have launched with no capital investment and have been completely financed by the operator. This type of approach reduced implementation time because it was not tied to a public grant application process and other federal, state or local funding requirements.

However, other systems, such as Capital BikeShare in Washington D.C. and Arlington, VA., required financing from a variety of sources to cover the capital costs and revenue requirements for the system to be launched and operated.

Regardless of what other systems have done, the financing strategy for bike share in Atlanta and Decatur should be tied to the operational model selected and the community goals for bike sharing in these cities. Once these requirements are identified and defined, the types of funding needed can be identified and pursued.

It is also important to put these financial requirements for bike share in context to other transportation infrastructure. As one comparison, a bus route that runs every 30 minutes would cost approximately \$6.1 million over six years. Using the high-end estimate for bike share capital and operations costs of \$12.9 million, bike share could roughly same as two bus routes.

For another comparison, the I-75/I-85 connector (from the Brookwood Interchange to the Airport split) is programmed to have managed lanes at a cost of \$90 million. The project is programmed for planning starting in 2014 but will not be operational until 2020. For 14% of the cost of this project, bike share could be built and operational within two years and easily built out by the time this interstate project is ready to open.

Both of these comparisons are not included to diminish the significance of other transportation investments. In fact, regional transportation policy needs to address all modes including transit service, biking, walking and driving. The comparison is included solely to show how a bike share system, relative to other transportation infrastructure, can be a cost-effective investment to address mobility needs.



Owning and Operating Bike Share

There is no one best organizational model for a bike sharing service, however, two have proven most effective and common in the US: the non-profit and public-private partnership. Selection of the appropriate organizational model should include a consideration of where desired control of the service is to reside – in the public or private sector – and time commitment Atlanta and Decatur can contribute to the service. With greater control of the service comes a greater time commitment. Otherwise, both models and courses of action below are effective at establishing a bike share service.

Non-profit

A non-profit organization can be established with the purpose of owning and/or operating a bike share service for the region. The organization would be responsible for obtaining funding, administering the service, station siting, and selecting the equipment vendor and possibly an operator. The non-profit can decide to either operate the service itself, if it believes it is capable of the task, or select an operator to do so. In many cases the equipment vendor and operator are bundled together, however, this isn't always the case.

With this model, Atlanta and Decatur would support the non-profit with funding and streamlining a process through which station locations can be permitted. The board of directors should include bicycle and transit advocates, representatives from the member jurisdictions, and the business community.

Public-private partnership

A public-private partnership would include shared ownership and operational responsibility between public and private entities. For example, a cooperative solicitation could be issued where Atlanta takes the lead on the equipment vendor/operator tender, with Decatur contributing its contract boilerplate language and other important sections to the final agreement. From this, a standard agreement would be created which defines level of service, establishes unit pricing for equipment and operations, among other items.

An interjurisdictional agreement would then be created, which discusses the benefits and responsibilities of each jurisdiction, such as how revenues are to be distributed and when, how marketing is to be done and paid for, consensus-building and voting, etc. Additionally, the service should have a board of directors which includes one or two representatives from each member jurisdiction and a representative from the operator.

Crystal Dr & 20th St S



Crystal bikeshare



CRYSTALCITY

Local Capital Bikeshare Stations



Bike Station Placement and Size

The primary requirement for the placement of stations is that they need to be publicly visible and accessible. These two requirements make it easy for members and casual users to find stations and check out or return bikes.

In terms of system design, stations should be placed at a frequency that makes finding a bicycle easy when one is needed and easily returned at or near a destination when done. In high-traffic or high-destination density areas, such as downtown, the frequency of stations could be one station every three to five blocks. In areas that are less dense, spacing may be more dispersed and only located at primary destinations in the area.

As a general guide for the selection of bike share station location, the following areas are ideal locations and include:

- Sidewalks or in the roadway, such as in an on-street parking space. Stations should not block pedestrian flow or force pedestrians into the roadway.
- Proximity to user destinations.
- Adjacent to existing or proposed bike lanes or cycle tracks, whenever possible. This strategy will make it more comfortable for all users to use bike share and to cover at least a portion of a ride within a dedicated bicycle facility.
- Major transit stations or bus stops. Bike share trips are often used to supplement transit trips and many bike share users will likely be transit users.
- Near major cultural or tourist attractions, as well as social destinations, such as commercial nodes in Virginia-Highland.
- Adjacent to major public spaces and parks, such as adjacent to the Atlanta BeltLine.

The size of bike share stations should vary based on the volume of traffic and the proximity to other stations. Areas with high demand should have more bikes and space to dock or lock a bike when returned.

Also, bike share stations need to have more docks or places to lock a bike than actual bikes. This strategy is important as it makes it easy for users to return bikes to their station of choice and destination, rather than having to find a near-by station that is not full to return a bike. For fixed stations, a general rule is to have 40-50% more docks than bikes programmed for a particular station. Flexible stations models, such as viaCycle, can have more flexibility because they do not require dedicated locking mechanisms because they can use traditional bike racks or other street furniture. However, if this type of system is selected, adequate bicycle parking should still be provided so that bike share bikes do not compete for personal bicycle parking.

The actual location of a bike share station will vary depending on the destination and the amount of public right-of-way available for a station. On the following page is a summary of the three primary location typologies that should be anticipated. They include:

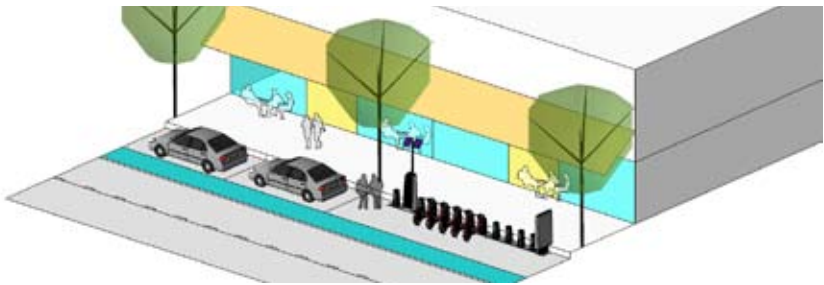
- In-Street Station
- Sidewalk Station
- Public Space Station

As a bike share system is developed, policies and design strategies should be developed to address the requirements for each of these placement strategies.

Station Placement Strategies

Station Placement

In-Street Station



Considerations

Best used along streets with narrow sidewalks where bike stations would block pedestrian flow if placed on the sidewalk.

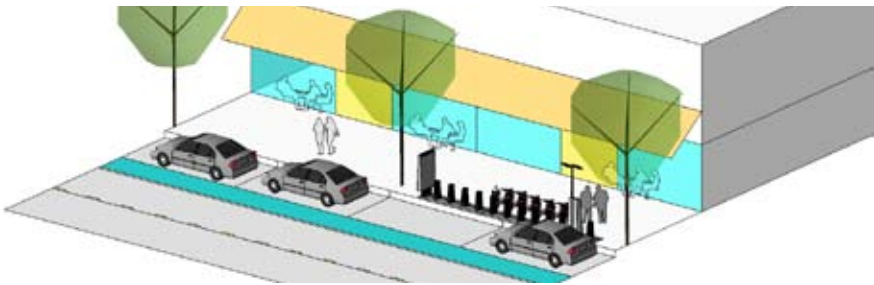
On-street parking spaces are ideal locations, since they do not impact traffic flow in travel lanes.

Bikes should be positioned so that the front of the bikes face the adjacent travel lane. This strategy forces users to return or remove bikes away from a travel lane.

Examples



Sidewalk Station



Considerations

Use when adequate sidewalk space is available so that bike stations do not block pedestrian flow and when there is not a safe location within the roadway to place a station.

Provide adequate clearance.

Place stations either adjacent to the curb or flush against a building wall.

Locate stations at highly visible locations and as close to entrances of primary buildings or destinations as possible. This improves access to destinations and visibility of the system for users.

Examples



Public Space Station



Considerations

Placement priority should be given to publicly owned public space. Privately owned public space is also an option.

Plazas at transit stations or in front of buildings are an example of privately owned public space.

Place stations at the edges of public space closest to the street or major entrances, if possible. This improves access and visibility from the street.

Location on private property must be coordinated with the land owner.

Examples



Bike Station Design and Installation

Station design and installation need to meet several minimum criteria to provide adequate access, use and visibility. These requirements include:

- Dedicated locking mechanism and space
- Kiosk
- Signage

The dedicated locking mechanism allows bikes to be returned securely at the end of a trip. With fixed stations, this means having an adequate number of docks. With flexible stations, this means having adequate bike racks.

The kiosks provide several important features including access to the user-interface and digital information about the system. This is particularly important for members without mobile device access or casual users, such as tourists. The kiosks also build in equity to the system by not requiring a mobile device, such as a smart phone or cell phone, to use the system. The kiosks make the system available to anyone with a credit card or membership card.

Signage is another important component of bike station design. For all users, signage can provide system information, such as a map, or public service information, such as bicycle safety announcements. Signage can also be used to enhance the visibility of stations and make it easier for users to locate stations. Depending on the type of business model, signage can be dedicated advertising.

Finally, a power source needs to be a part of any system because of the digital and technology requirements needed for modern bike share systems to operate. Bike share stations have advanced significantly from first generation systems. Original systems required significant access to electrical sources via underground utilities or other sources. Today, many systems operate on solar power and batteries. These new features allow stations to have a small foot print that does not conflict with other underground utilities. These features should be required with any system to provide flexibility with station placement and minimize conflict with utilities.

Theft and Vandalism

While bike theft and vandalism has been minimal with most bike share systems, it is still a concern and challenge that needs to be addressed. There are several counter-measures that other systems have taken to limit theft and vandalism:

- Bike share bikes should have unique designs, including the frames and mechanical parts, that do not work with bikes other than the system. Often times bikes are stolen for their individual parts. If the bike can not be disassembled and the parts re-used on regular bikes, there is less of an incentive to steal them.
- Locking mechanisms should be easy to use and indicate when a bike is successfully returned. This strategy ensures bikes are properly locked when returned.
- Significant penalties for lost bicycles should be used. The penalty for a lost bicycle should be set high enough to discourage people from stealing them and to be diligent about returning them.
- Credit card theft and identity fraud have been an issue with other systems. Strategies, such as requiring the purchaser to physically have their card with them at the time of purchase, can help address these issues.
- Bikes should be located in high traffic, well lit and highly visible areas. Public visibility of bike share stations should help discourage theft and other acts of vandalism.

Theft and vandalism strategies should be required with any bike share system and operator.

Procedural Recommendations

In terms of process, this study is step one of many required to launch a bike share system in Atlanta and Decatur. Before a system can be launched, there are many decisions that need to be deliberated and made. To help guide the process, it is recommended that Atlanta and Decatur create an organization, task force or committee to take responsibility and leadership of bike share implementation. The purpose of this approach is to explore the requirements for bike share in more detail and make recommendations about the operational model, community goals, investment strategies and other implementation requirements.

As part of this next step, a formal process and timeline should be adopted for launching a bike share system, if it is something the community decides to support. The US Department of Transportation, Federal Highway Administration has developed a generic process to guide implementation efforts. The three parts include:

- Planning
- Implementation
- Performance Tracking and Assessment

Any committee or other guiding body should use these recommendations as a starting point and develop a process that reflects the unique requirements for bike share in Atlanta and Decatur.

Bike Share Implementation Steps

Phase	Components
Planning	Conduct Feasibility Study Select business model Identify and secure funding Procure vendor and operator Consider issues of equity Consider infrastructure improvements
Implementation	Select service hours and seasonal availability Program marketing and sustainability Address safety and livability considerations Develop bicycle redistribution strategy Develop theft and vandalism protocols
Performance and Tracking Assessment	Track system performance by analyzing data Integrate system with transit network Improve bicycle visibility with marketing and education campaigns Promote healthy living Continually calibrate system to improve accessibility based on performance, user preferences and community goals

Source: Bicycle Sharing in the United States: State of Practice and Guide to Implementation

Policy and Regulatory Development

To ensure bike share can operate legally and successfully, policies and regulations will need to be changed or developed. Addressing policy and regulatory considerations should be a component of the planning process and should be initiated early to ensure the appropriate requirements, guidelines and laws are in place at the time of launching a system.

To guide this part of the planning process, the Policy and Regulatory Review chapter of this report should be used as a starting point of discussion. The task force or steering committee should develop recommendations and work with the community and appropriate government agencies to adopt the needed changes.

Procurement of Vendor and/or Operator

When Atlanta and Decatur have developed a bike share implementation strategy, which should include elements such as selecting a preferred operational model and financing strategy, developed community goals for bike share, and addressing policy and regulatory needs for bike share, a vendor and/or operator should be selected. The selection process should be conducted through a open and competitive request for proposal (RFP) process.

Atlanta and Decatur can benefit from peer city experiences with this process. To develop an RFP, a review of peer city RFPs for bike share should be conducted. Once the review is complete, the requirements for a bike share RFP should be adapted to city procurement policies and requirements. Both cities should work directly with the bike share task force or committee to develop an RFP that meets the community goals and is open and fair for all potential vendors and operators.

To help guide the initial discussions, the table on the following page is presented to give some guidance on the types of information to include in the RFP and the types of information to request from potential vendors and operators. The information is adapted from the Philadelphia Bike Share Concept study, and includes two RFP segments: information to be provided by the respondents and information to be provided by a city. Since the Philadelphia study, there are more vendors and operators and new bike share technology. Any RFP should be flexible to accommodate different operational strategies, innovations in bike share technology and calibration to local conditions and goals.

Market Research

Several bike share system have conducted market research as part of the planning process, and it is recommended that Atlanta and Decatur do the same. The market research can be used to identify current attitudes and behavior related to cycling, user groups likely to use a system, gauge how, why and where potential users will use bike share, as well as other relevant information for bike share planning. The information can be used to inform the technical planning, policy and regulatory development, infrastructure planning and public opinion.

As an example, Chattanooga conducted a market study as part of the planning for its bike share system. The research methods included surveys and focus groups. The study helped identify existing barriers to cycling, such as safety concerns and a lack of adequate bicycle infrastructure, as well as effective marketing strategies that can address concerns or potential benefits for users.¹

Example Bike Share Request for Proposal Components

RFP Segment	Component	Example Information and Language
Information to be provided by the City	Recommended/Required Bicycle Components	<p>The bicycle design should include the following:</p> <p>Step-through frame; adjustable seat; front basket; high stability kickstand; heavy-duty material; chain guard; bicycle bell; secondary lock; disc brakes; lights (automatically activated); fenders; multiple gears; puncture resistant tires; etc.</p> <p>Bicycle-specific parts (non-interchangeable with other bicycles)</p> <p>Other theft/vandalism deterring methods (GPS tracking, etc.)</p>
	Overview of Program Scope	<p>Program scope information should include:</p> <p>Size of service area; Phasing; Amount of bicycles/stations</p>
	City's Provision of Right-of-Way	<p>Example text:</p> <p>The City will assist in the provision of public space in order to site bikeshare stations.</p> <p>The City will maintain all rights to determine appropriate siting of the stations.</p>
	Required Hours of Operations	<p>Example text:</p> <p>The system will operate 365 days a year, 24 hours per day.</p> <p>The system must be able to completely shut down should weather or other incidents require its closure.</p>
	Specific Performance Standards	<p>Example text:</p> <p>95% of bikes must be operational at all times.</p> <p>The operator is required to share data regarding the usage of the system, as outlined in the RFP.</p> <p>Any vandalism to the system must be remediated by the operator within a specific time period.</p> <p>Distribution standards for stations and bicycles will be set between the operator and the City i.e. percentage of time station spent full/empty, etc.</p>
	Outlined Contract Incentives and Adjustments	<p>The City should specify revenue sharing or specific incentives for private operators to provide appropriate accessibility and mobility for users.</p> <p>The City and the operator reserve the right to adjust the contract in the future in terms of expansion, termination, etc.</p>
	Required Operator Qualifications	<p>The City should include specific requirements for vendor experience in mobility services and customer service.</p>
	Provision of Important Reference Documents	<p>The City should provide documents that describe the service areas and document other important information needed to develop a response to an RFP including:</p> <p>Feasibility study; Maps of existing bicycle infrastructure, transit service, proposed target implementation zones, and other relevant data; GIS data as needed</p>
	Implementation Targets	<p>The City should outline specific targets for implementation such as:</p> <p>The desired timeline for implementation should be within 6 months of the awarding of the contract.</p>
	Maintenance Plan for Bikes and Stations	<p>The proposal should provide an outline for frequency of repairs and tune-ups</p>
Information to be provided by respondents	Plan for Bike Redistribution	<p>Will a vehicle be needed?</p> <p>How many people will be employed?</p>
	Method of Data Collection and Sharing	<p>Operator must provide the performance information to the city on a monthly basis such as:</p> <p>Vehicle miles traveled (per bicycle); Number of trips and duration; number of customers per membership types; Number of bikes in fleet at the end of each month; Etc.</p>
	Comprehensive Marketing/Branding Plan	<p>The proposal should include the administration of an annual customer/user survey.</p>
	Detailed Financial Plan	<p>The financial plan should include elements such as:</p> <p>Estimated capital and operational costs; Estimated usage rates; Charging scheme and fee structure (including deposits for bicycles); Revenue projections, including user revenue, advertising, etc.; Value of assets; Infrastructure replacement costs</p>
	Details of Equipment and Infrastructure	<p>Accurate and specific details about system infrastructure should be provided such as:</p> <p>Bikes and locking mechanism; Customer interface; Back-end system/Call center; Website</p>
	Theft and Losses	<p>Example Request:</p> <p>A detailed and straight forward plan for combating theft must be outlined.</p> <p>A detailed plan for dealing with theft and major vandalism must also be outlined, as well as potential costs incurred.</p>
	Plan for Liability/Insurance Coverage	<p>The liability and insurance coverage should address indemnification for the city and operator.</p>
	Incorporation of Innovative Design/Operational Features	<p>Example Request:</p> <p>Integration with existing transit service is a highly desirable feature for the bike share system.</p> <p>A modular system that requires minimal digging and tie in to utilities is highly preferred.</p> <p>A comprehensive plan for educating users is highly desirable.</p> <p>The ability to provide access to low-income residents is highly desired and alternative payment and deposit options should be considered.</p>

Source: Philadelphia Bikeshare Concept Study, 2010

Public Outreach and Involvement

Bike share will be a new addition to transit service in Atlanta and Decatur and will impact residents, business, institutions and visitors among others. Because of the dynamic nature of a bike share system, it is recommended that public outreach and involvement be integrated with planning efforts.

The public outreach should include, at a minimum, public meetings to give people the opportunity to learn about bike share and ask questions about how their lives could be impacted by a system. Additionally, community input should be solicited to refine how and where bike share should operate. This can be done through a variety of mediums including public meetings, surveys, social media, websites and other online media.

The purpose of public outreach and involvement is also to building community understanding and support for bike share, establish transparency with the planning process and collect implementation ideas from all of those who are interested in the idea. With adequate involvement, bike share can be successfully integrated into daily life in Atlanta and Decatur.

Infrastructure

Having dedicated bicycle facilities is not a requirement for a bike share system, but it is important to make riding a bike comfortable and safe activity. If people who do not have experience riding in traffic or urban conditions are going to be invited to use bike share in Atlanta and Decatur, adequate bike facilities need to be a part of the evolution of a bike share system and the preparation of launching a bike share.

Information about existing and planned facilities should be used to guide system planning, bike station location, and help prioritize planning and construction of bicycle facilities. As a starting point, a survey and inventory of existing bike facilities should be conducted. While data on existing bicycle facilities has been incorporated in this report, it was compiled from a variety of sources. A current and comprehensive inventory could help inform planning efforts moving forward.

Likewise, an accurate list of planned bicycle facilities should be developed. The identification of future facilities can help prioritize construction funding and planning for future facilities and can be used to inform bike share planning.

The end goal with new bicycle infrastructure is to make it safe for all users of the transportation network in Atlanta and Decatur. This goal includes not just people riding a bike, but people walking, driving and using public transportation. To this end, infrastructure planning should pay particular attention to other transportation improvement projects. Street resurfacing or new streetscape may present an opportunity to create an on-street bicycle facility or a space for a bike share station. As another example, the siting of bus stop shelters at key transfer points may present the opportunity to coordinate the location of a bike share station as well. With these examples in mind, infrastructure planning should go beyond dedicated bicycle facilities to ensure bike share is properly integrated with other modes of travel.

Enforcement

For cycling to be safe, everyone traveling by bike, car, foot, public transit, or other vehicle needs to obey traffic laws. Education about the laws governing cycling should be shared with all travelers as well as law enforcement during the build up to launching a bike share system. Additionally, once bike share is launched, additional enforcement efforts should be used ensure everyone uses the streets of Atlanta and Decatur safely.

As an example, the Boston Police Department and the Boston Public Health Commission increased enforcement and education campaigns as part of the initial launch of the New Balance HubWay system. From the law enforcement side, police targeted people driving vehicles and riding bikes at areas that have presented safety concerns. The goal of the enforcement campaign was to educate people about how to drive or ride safely and to correct unsafe travel behaviors. Additionally, the Boston Public Health Commission and other officials distributed flyers promoting proper cycling etiquette and rules of the road.² A similar type approach should be used in Atlanta and Decatur.

As was the approach in Boston, enforcement and education efforts should target cyclists and drivers. Many motor vehicle operators do not know how to drive with cyclists in the street or they may treat cyclists illegally with unsafe or aggressive driving. Good driving behavior should be encouraged and bad driving behavior should be corrected with warnings or other penalties.

Likewise, cyclists in Atlanta and Decatur need to obey traffic laws just like drivers. Education and enforcement efforts should be tailored to educate and discourage unsafe riding habits.

Education, Outreach and Marketing

Because bike sharing will be a new transportation choice and because many people will be riding bikes in Atlanta and Decatur for the first time, education and outreach efforts need to be a part of bike share implementation and operation. The responsibility for education and outreach efforts should be shared by all of those involved with the planning, implementation and operation of a bike share system. Some of the responsible parties include the City of Atlanta, City of Decatur and local organizations.

The education, outreach and marketing efforts should also be used to promote system and make people aware about how to use the system. These efforts should start during the initial planning stages and carry on after a bike share system is launched and operating. These efforts should also target groups beyond potential members and could include among others, tourists, transit riders, pedestrians, local organizations and others who could either be potential users or will likely have to deal with people using the system as they navigate the streets of Atlanta and Decatur.

Safe Cycling and Helmet Use

Ensuring people use a bike share system safely is a primary requirement for any system. The use of a helmet when riding is one strategy to promote the safe use of bike share. Likewise, there are other measures to promote safe cycling that include promoting good cycling and driving behavior and protected bicycle facilities.

For Atlanta and Decatur, it is recommended that helmet use be recommended and encouraged, but not required. The reason for this approach is practical and user driven. Not everyone has immediate access to a helmet. This is particularly true for many tourists and casual users. Without access to a helmet, they are not able to use the system.

Even though helmets should not be required, there are several strategies that other cities have taken to promote the use of a helmet when using bike share. Some of them include:

- Provide free helmets with annual membership
- Distribute free helmets at promotional campaigns
- Install helmet vending machines with bike share stations
- Promote helmet use through public service campaigns

The above recommendations and strategies should be combined with education efforts and infrastructure improvements to improve overall cycling safety.

Equity Assurance

Bike sharing is an opportunity to expand mobility and access to city destinations for citizens and visitors. Benefits include access to a low-cost transportation option that is highly efficient, expands transportation choice and can decrease travel time for many users. These benefits are particularly true for those walking or using public transportation.

These benefits should be available for everyone, regardless of socio-economic situation. With peer city systems, barriers for low-income residents or other groups have been identified. The barriers such as the requirement for a credit card to sign up or simply not knowing how to ride a bike are some of the issues identified.

It is recommended that Atlanta and Decatur address equity and access issues as part of the planning and operation of a bike share system. Everyone should have access to safe and affordable transportation options and bike share can deliver both. Atlanta and Decatur should learn from other cities in how they have addressed these challenges to ensure bike share is accessible and available to everyone interested in using the system.

The approach in Boston with the New Balance Hubway system is instructive on this topic and can be used to guide social equity strategies with bike share in Atlanta and Decatur. With the New Balance Hubway system, a multi-part approach to equity was developed that included not just bike share strategies but community outreach strategies and education campaigns.³ By taking this multi-part approach, they were able to support and encourage cycling in areas that may not have otherwise had access to the system because of income or other social factors.

To guide the development of equity assurance strategies in Atlanta and Decatur, the table on the following page summarizes some of the barriers identified in Boston and how they were addressed. The Boston strategies can be used as a starting point to develop an equity assurance component to bike share planning and operation in Atlanta and Decatur.

Bike Share Barriers and Solutions for Health Equity in Boston

Barrier Type	Barrier	Solution
Access Barrier	Need a credit card to register	Can use debit card as well; Buy at retailers
	Need computer to register	Can call; membership drives at partner sites
	Language barrier	New Balance Hubway 3 languages; BPHC's language line; subsidized flyers in 5 languages; partner support
	A deposit required	Not applicable for annual or subsidized memberships
	Price	Annual subsidized membership lowered from \$85 to \$5 - includes a free helmet; \$50-65 promotional price for regular memberships sometimes offered
Use Barrier	Lack of bike riding skills	Trainings offered (outreach needed)
	Knowledge of station locations	Stations map placed at targeted stations; info on website; neighborhood bike rides
	Lack of familiarity with the system	Membership drives, increase education
	Fear of additional charges after "free" period	First hour now free now; promoting bike share for leisure as well; education; neighborhood bike rides; strengthening network of bikes in neighborhoods
	Biking not popular among all groups	Neighborhood promotion (bike rides, "radio" personality); increase education

Source: De La Rosa, D. 2012. Addressing Health Equity in Boston's Bike Share System. Social Equity and Bikesharing Netconference. <http://www.nctr.usf.edu/2012/05/social-equity-bikesharing-netconference/>. Accessed August 26, 2012.

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2. Nusca, A. 2011. Boston police prep for Hubway bike-sharing program. <http://www.smartplanet.com/blog/smart-takes/boston-police-prep-for-hubway-bike-sharing-program/17660>. Accessed August 26, 2012.
3. De La Rosa, D. 2012. Addressing Health Equity in Boston's Bike Share System. Social Equity and Bikesharing Netconference. <http://www.nctr.usf.edu/2012/05/social-equity-bikesharing-netconference/>. Accessed August 26, 2012.

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Appendix

Photo Credits

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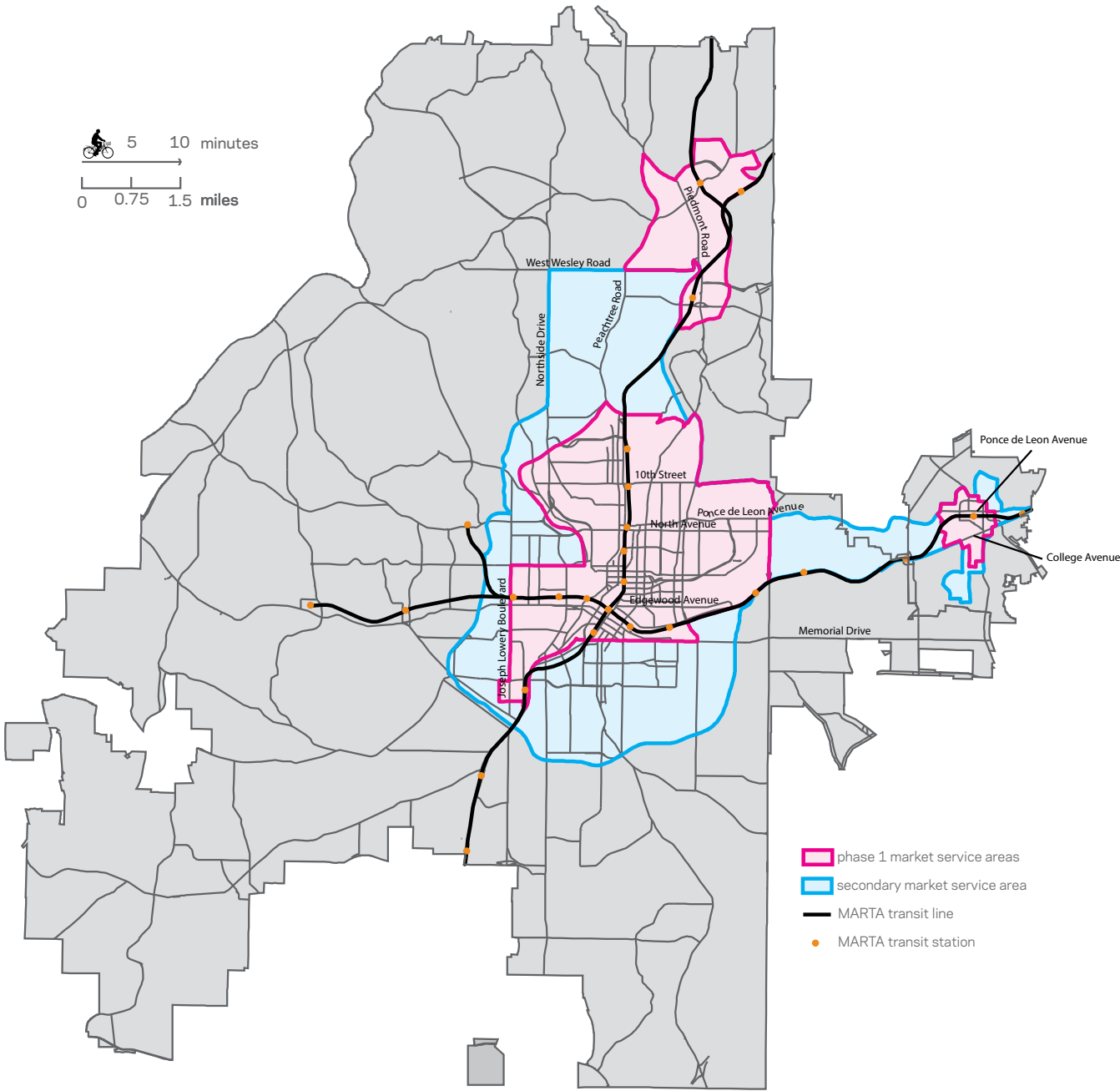
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page 39. (map) DECOBIKE
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Supplemental Maps

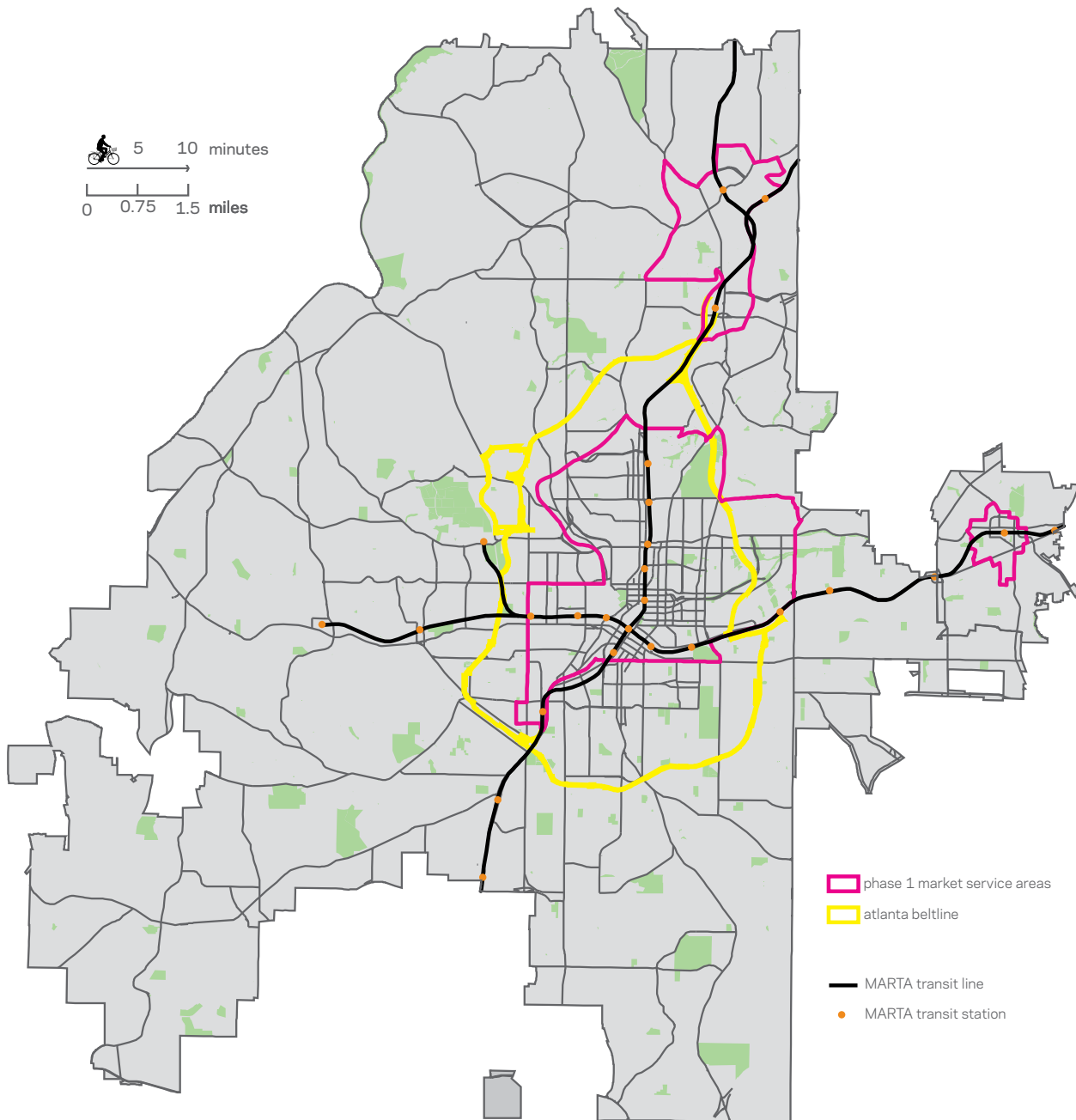
The maps on the subsequent pages are provided as additional resources and for reference. Below is a list of the maps in the order they are presented.

- Service Area Map with Street Labels
- Phase 1 Market Service Area Map with BeltLine
- Service Area Map with Atlanta Neighborhoods
- Service Area Map with Atlanta Neighborhood Planning Units
- Service Area Map with Equitable Target Areas
- Community Suitability Maps: Trip Origin Factors
- Community Suitability Maps: Trip Destination Factors
- Community Suitability Maps: Transportation Network Factors

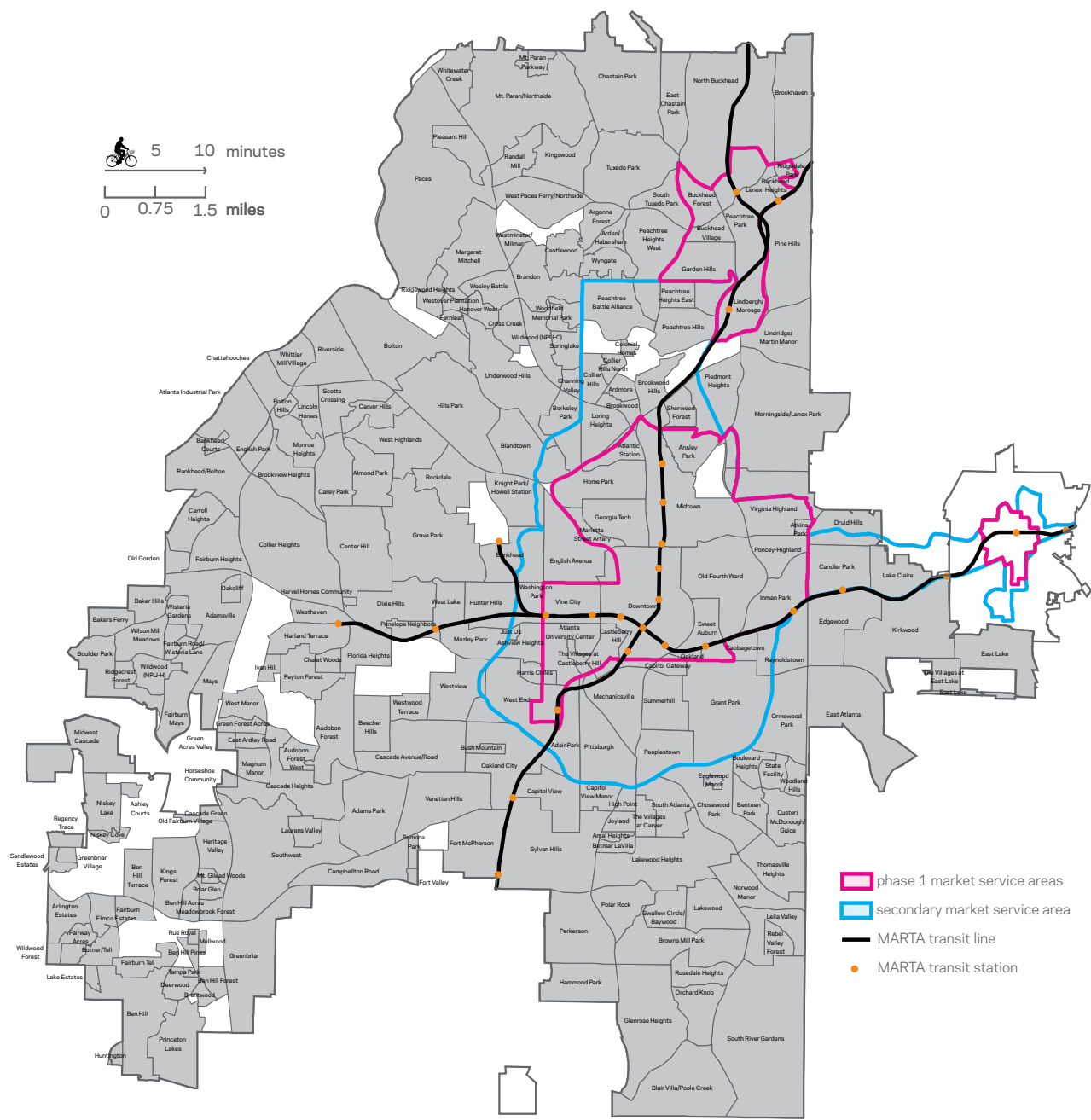
Service Area Map with Street Labels



Phase 1 Market Service Area Map with BeltLine



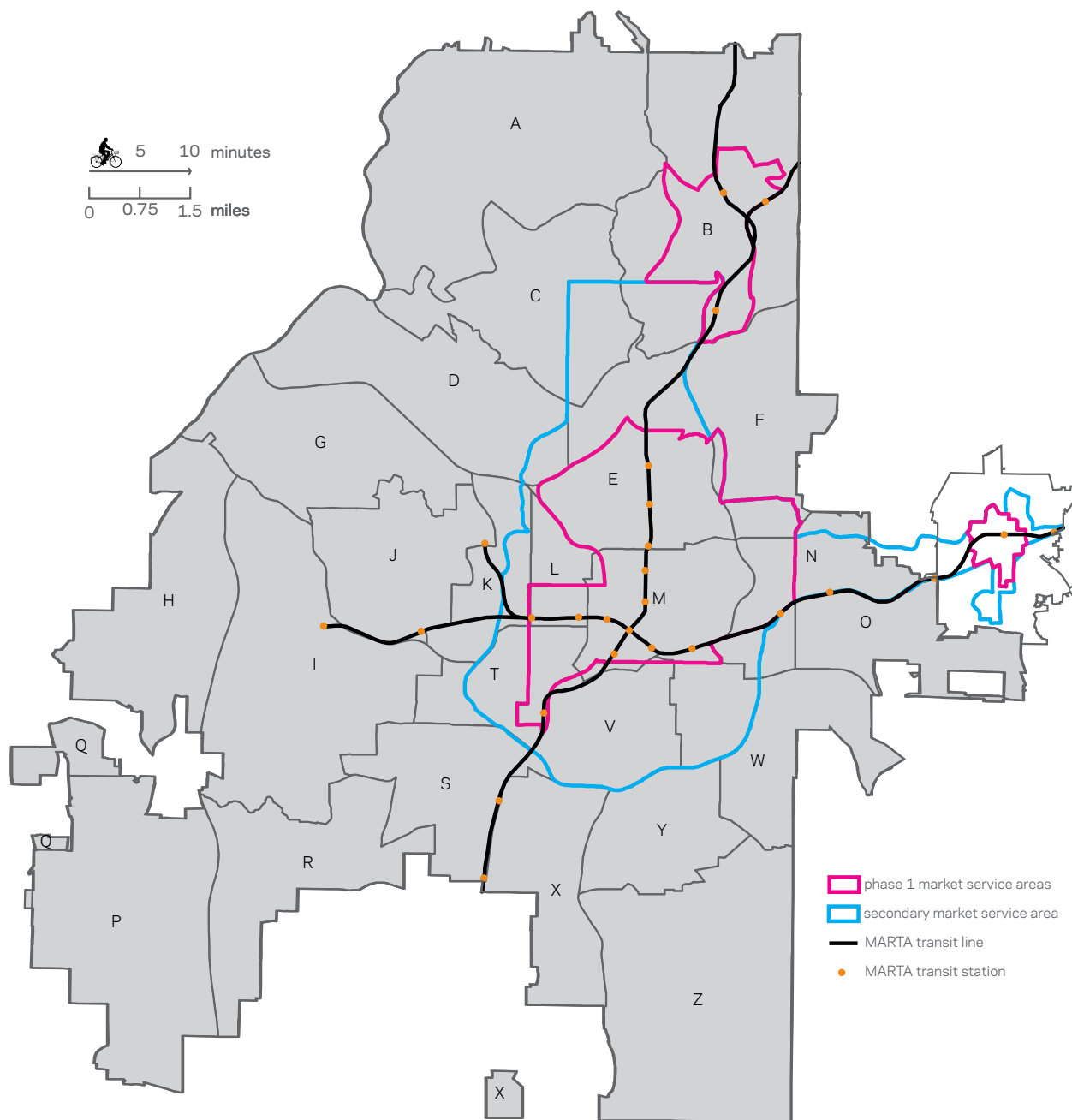
Service Area Map with Atlanta Neighborhoods



Atlanta Neighborhoods within Phase 1 Market Service Areas

Ashview Heights	Castleberry Hill	Lindbergh/Morosgo	Poncey-Highland
Atkins Park	Downtown	Marietta Street Artery	Sweet Auburn
Atlanta University Center	Garden Hills	Midtown	The Villages at Castleberry Hill
Atlantic Station	Georgia Tech	Morningside/Lenox Park	Vine City
Buckhead Forest	Harris Chiles	North Buckhead	Virginia Highland
Buckhead Heights	Home Park	Oakland	West End
Buckhead Village	Inman Park	Old Fourth Ward	
Capitol Gateway	Lenox	Peachtree Park	

Service Area Map with Atlanta Neighborhood Planning Units



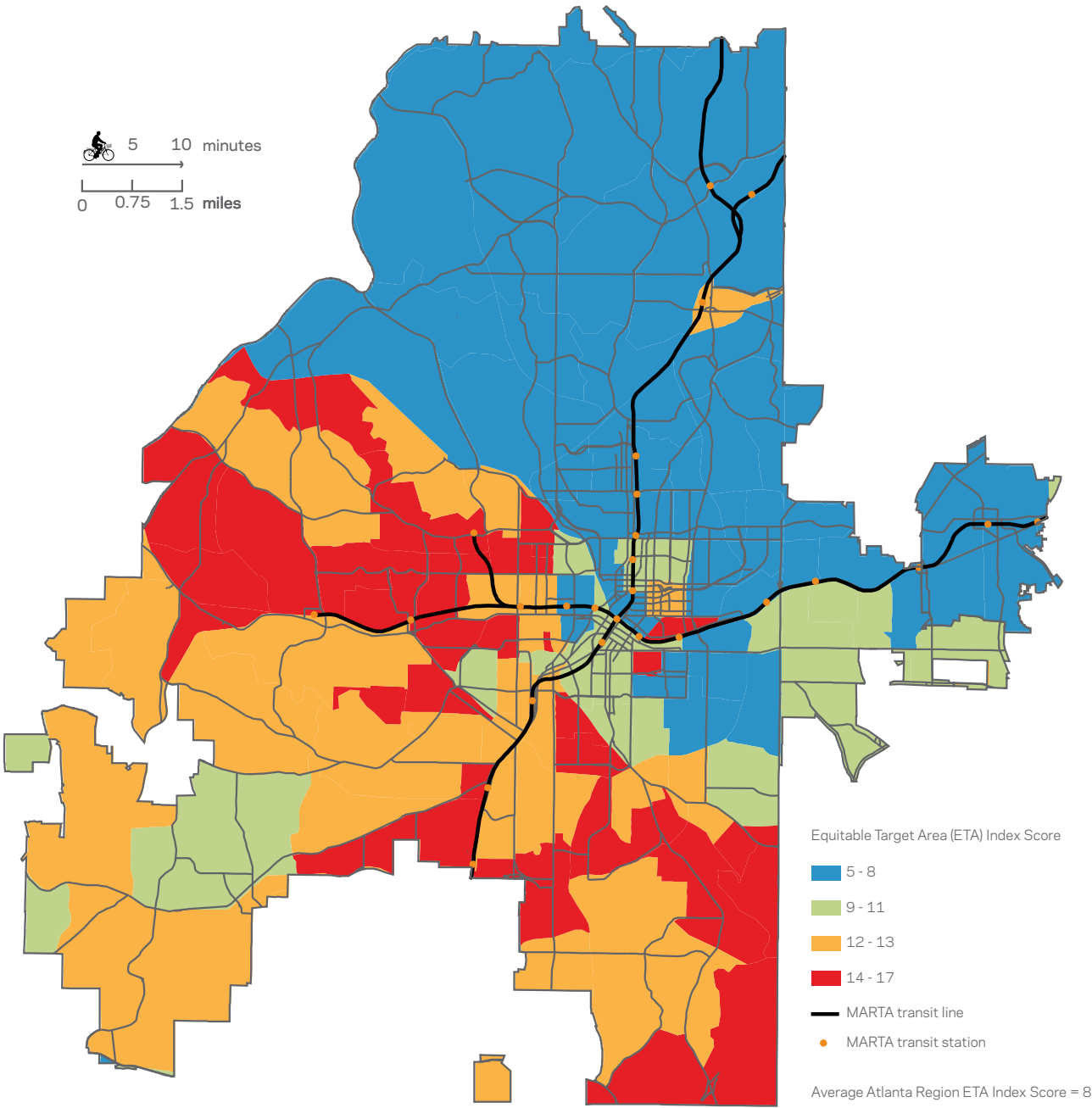
Atlanta Neighborhood Planning Units (NPUs) within Phase 1 Market Service Areas

NPU B
NPU E
NPU F

NPU L
NPU M
NPU N

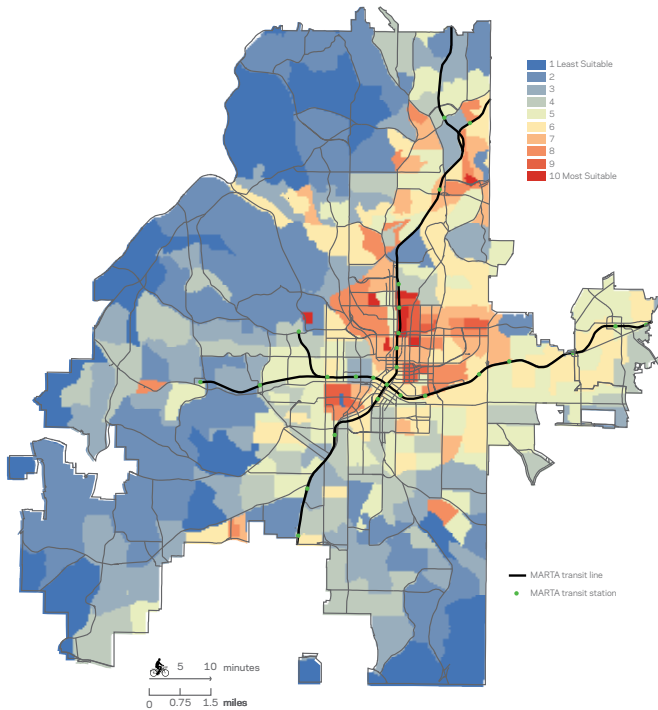
NPU T
NPU V
NPU W

Service Area Map with Equitable Target Areas

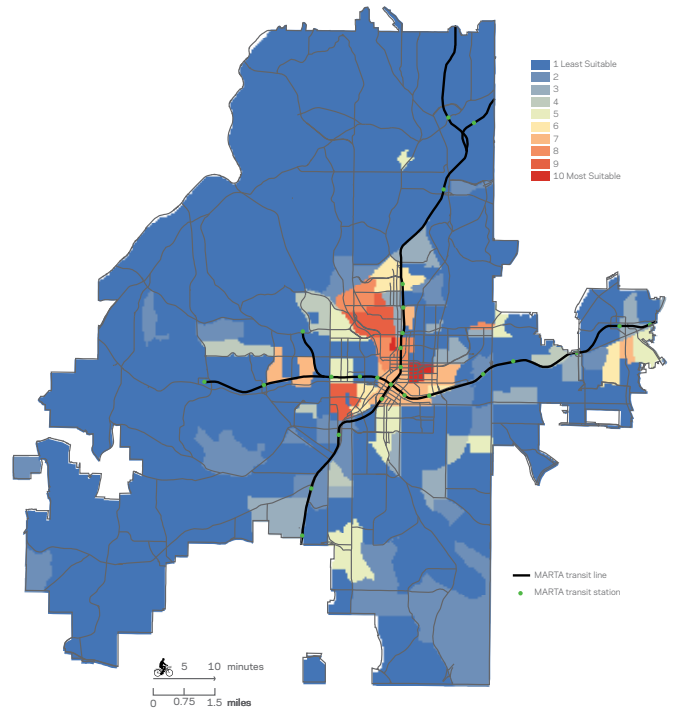


Community Suitability Maps: Trip Origin Factors

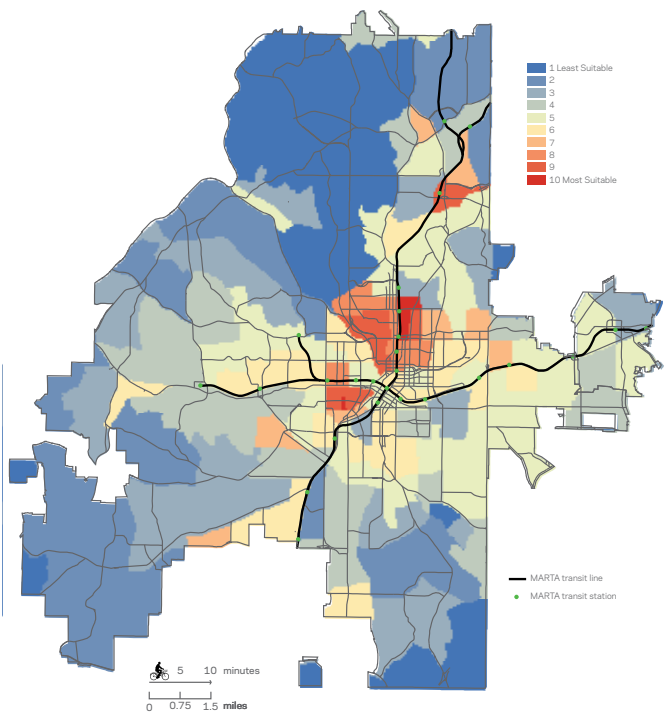
Residential Population Density for persons 18-64 years of age



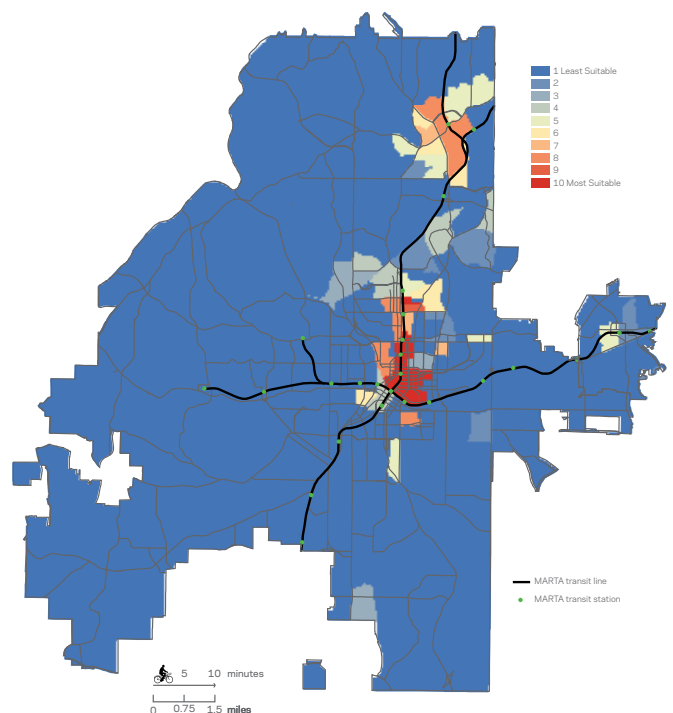
Non-Institutionalized Group Quarter Population Density (University Housing)



Alternative Commuters (% of alternative commuters)

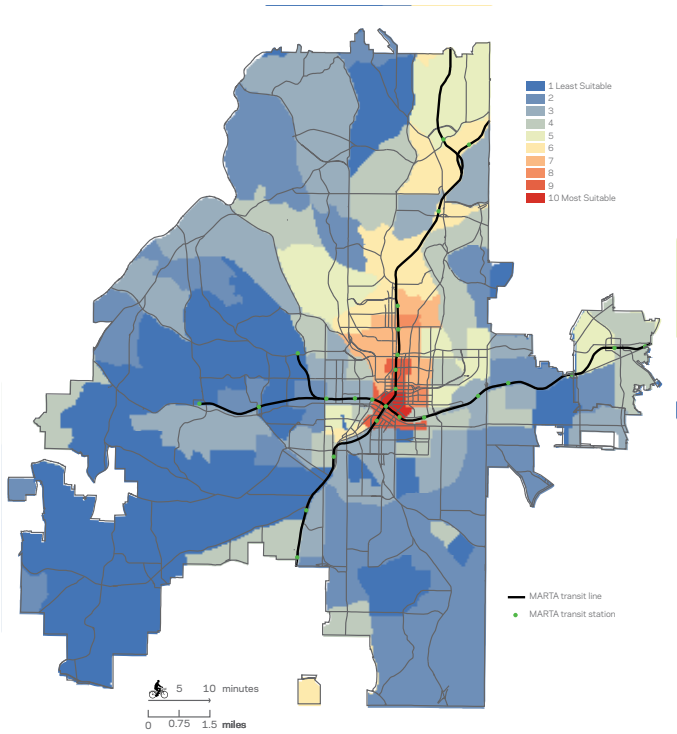


Hotel Density

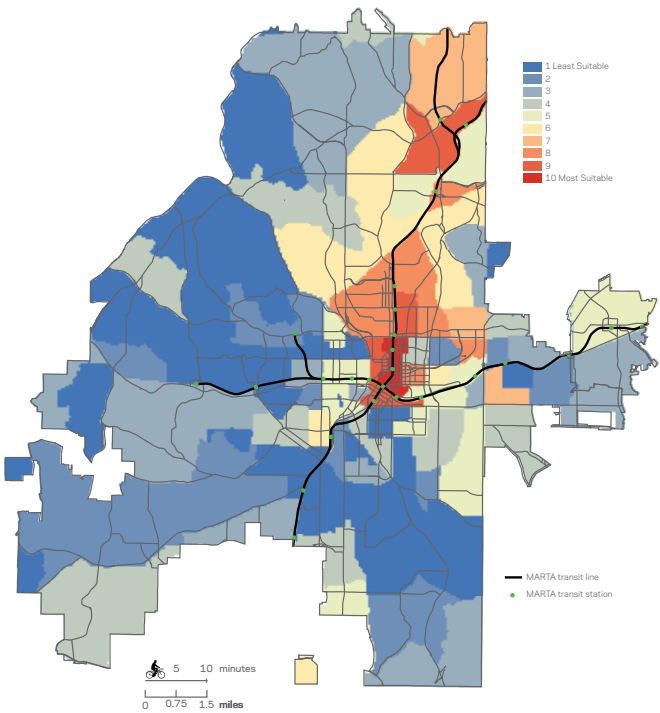


Community Suitability Maps: Trip Destination Factors

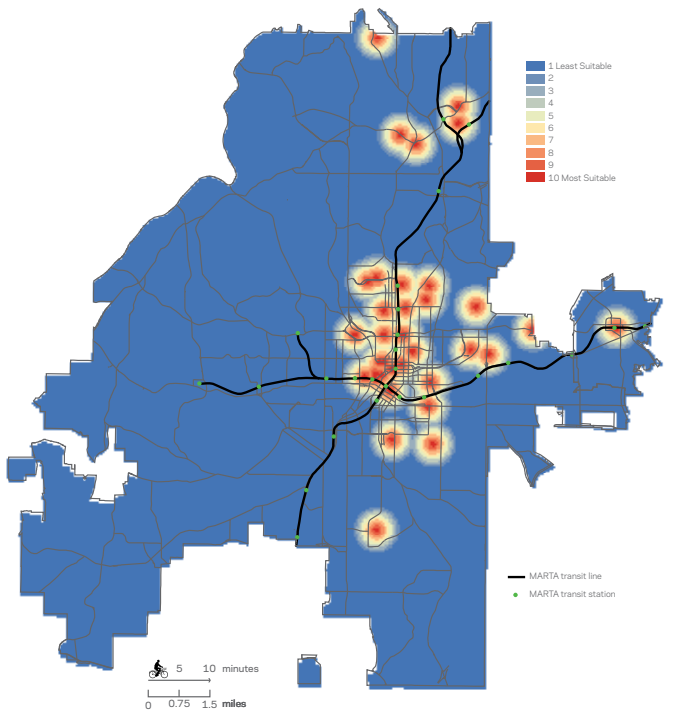
Employment Density



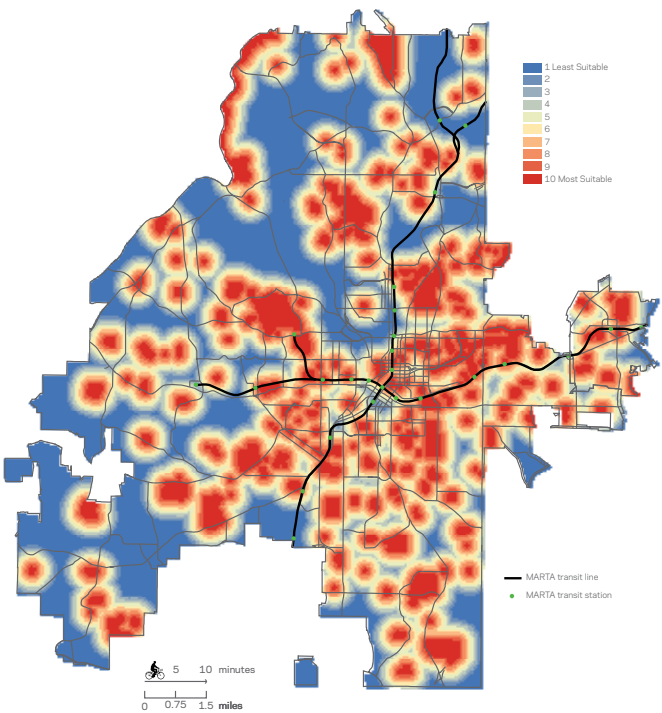
Retail/Entertainment Employment Density



Tourist and Entertainment Destinations

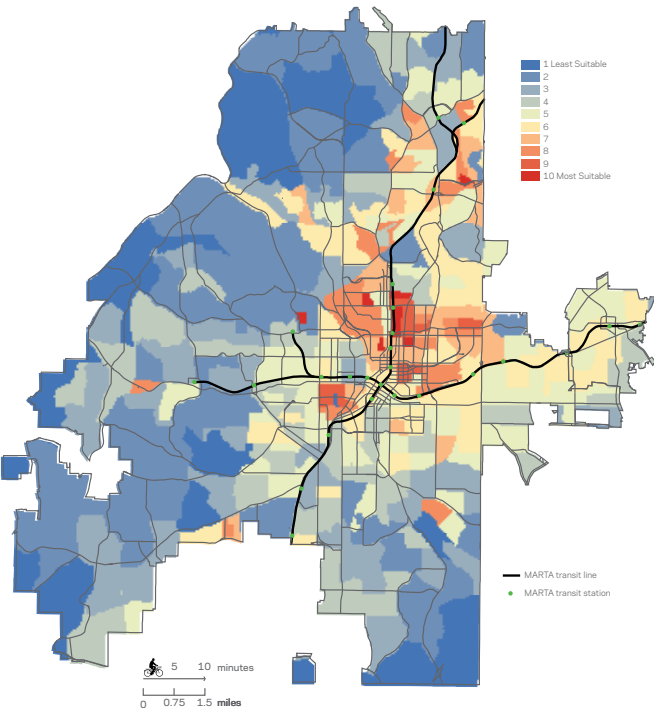


Parks and Recreation Areas

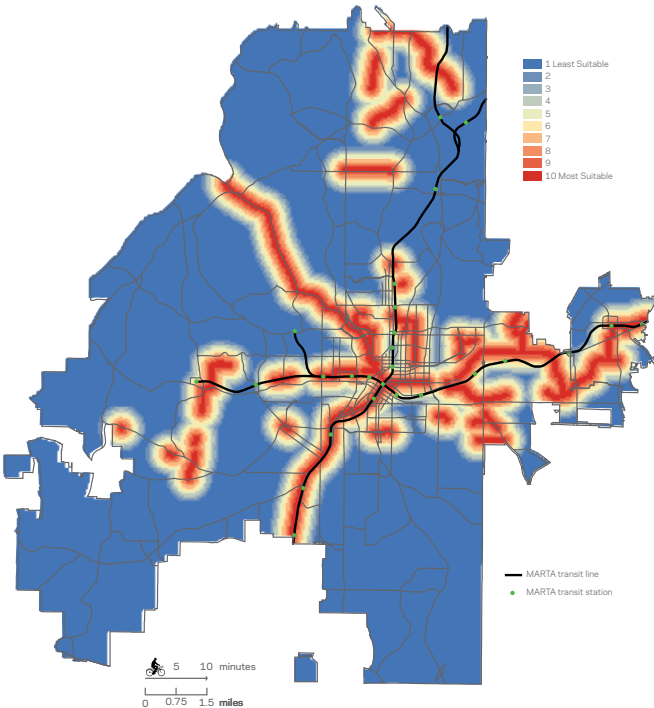


Community Suitability Maps: Transportation Network Factors

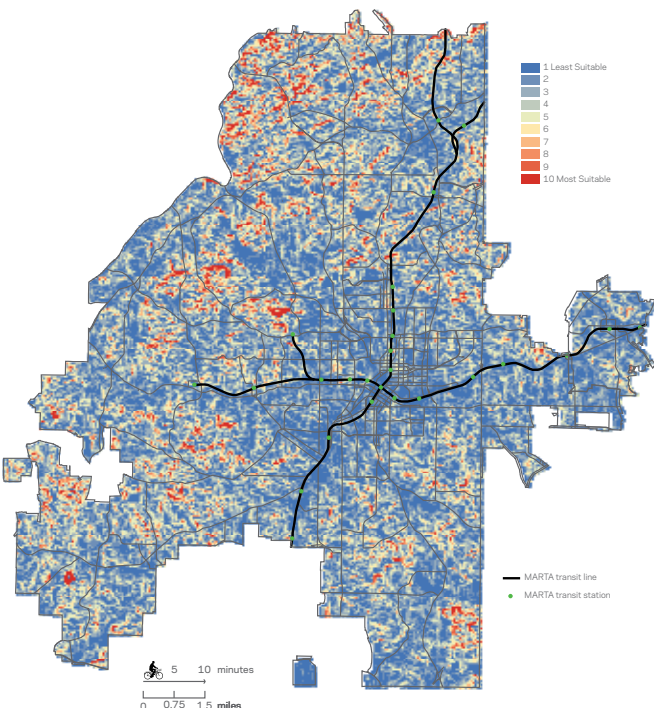
Dedicated Bicycle Facilities



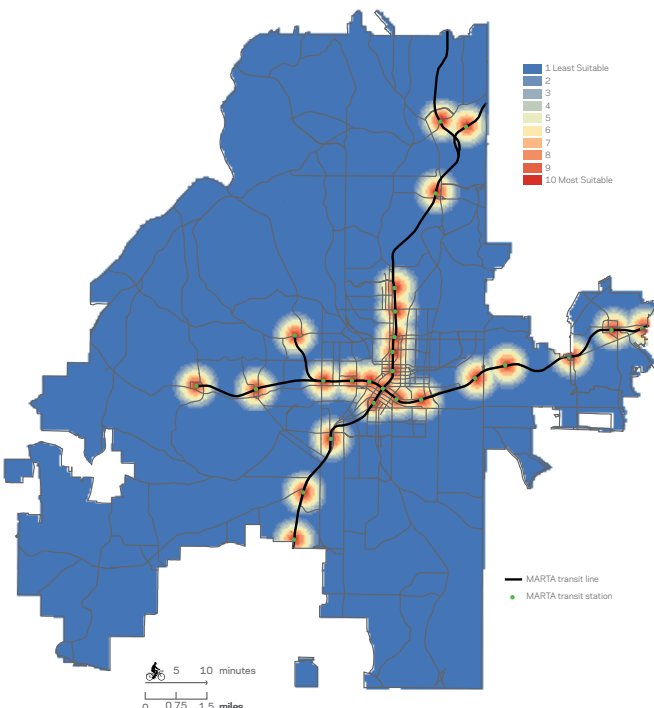
Shared Lane Bicycle Facilities



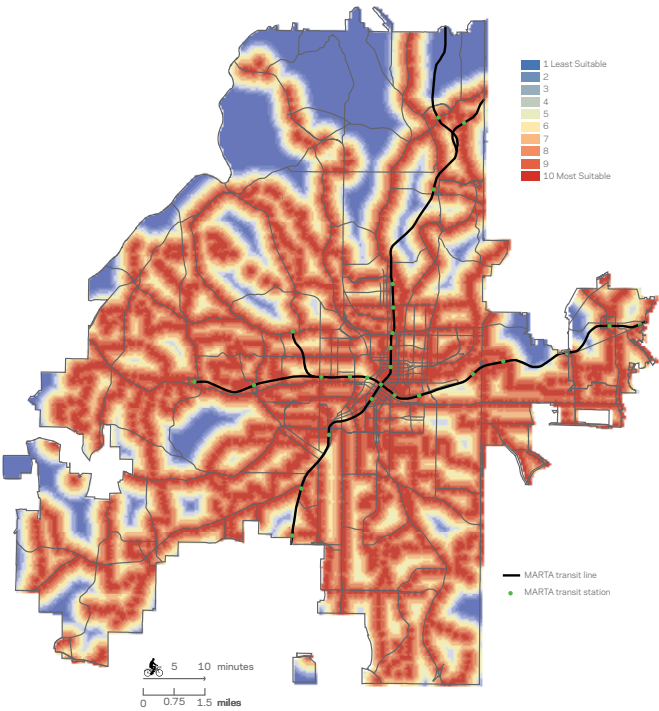
Topography



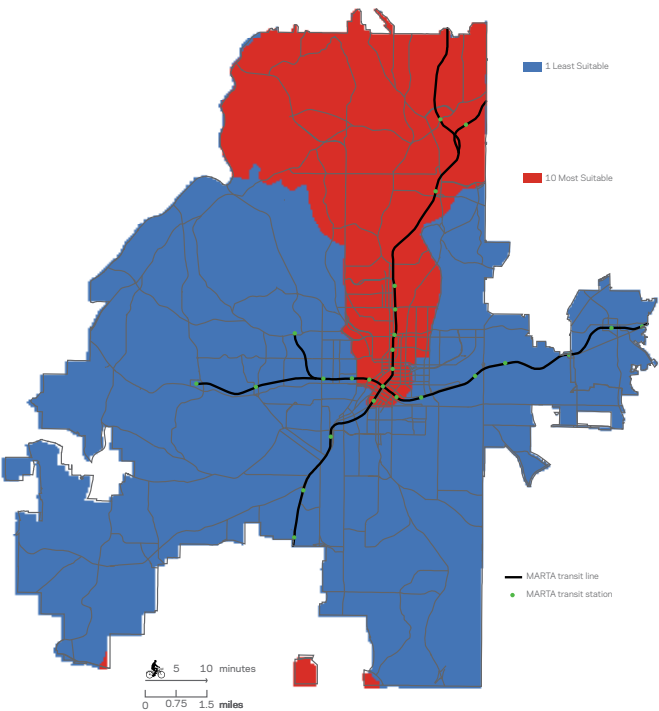
Transit Stations



Bus Stops



Employment Service Organizations (ESOs)





For better cycling. For a better city.