

A photograph showing a dense array of bicycles parked in rows. A person wearing a high-visibility yellow and blue vest is standing in the middle of the rows, looking towards the camera. The bicycles are mostly blue and white, with some having blue frames and white seats. The background is filled with the repeating pattern of bicycle seats and handlebars.

# Fort Collins Bike Share Business Plan

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*London Cycle Hire. Source: Reuters*

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## Executive Summary

The City of Fort Collins engaged Toole Design Group to prepare a business plan for the possible implementation of a bike share system in Fort Collins, Colorado. The business plan follows over twenty years of bike lending programs in the City and several recent studies that explored the feasibility of introducing an automated bike share system to the existing bike lending offerings.

The existing bike lending program is the Fort Collins Bike Library, which was established in 2008 and has recorded almost 20,000 bicycle checkouts by over 15,000 riders since it started. It has over 200 bikes, is headquartered at the Downtown Transit Center and is well-supported, particularly by visitors. Patrons of the Bike Library enjoy the personal interaction, low cost, and variety of bicycles available, and the program acts as a face for bicycling and visitor services in Fort Collins. In recent years the City, which manages the program, has looked at how it could expand the services of the Bike Library to include new locations, a larger fleet of bikes and upgraded services. The City also evaluated the potential to integrate the program with an automated bike share system.

The business plan includes a description of the business case for an automated bike share system and the risks that will need to be addressed, identifies an appropriate scale and phasing for the program, recommends an operating model that fits the characteristics of the community, presents a financial proforma and funding plan, and provides an implementation blueprint for the City and its partner agencies to move towards launch of a bike share system in Fort Collins.

The Business Plan was informed by public and stakeholder outreach that included two public meetings, an online map that allowed members of the public to suggest station locations, and workshops with stakeholder groups representing transportation, economic development, health, and other interests in the community. The Plan was guided by a Technical Advisory Committee (TAC) that met three times during the project and that will continue to meet to advance the recommendations of the Plan. Overall, public and stakeholder response was positive to an automated bike share system in Fort Collins and their input was used to guide decisions about the program.

### Business Case

An automated bike share system would help the City advance towards its goal of Diamond level Bicycle Friendly Community status with the League of American Bicyclists, introduce new riders to the benefits of bicycling, and promote Fort Collins to potential employers, residents, and visitors. It would augment existing services provided by the Fort Collins Bike Library and the two services together would offer a comprehensive set of options, filling an existing gap in the “bike rental / bike loan” market.

Other mid-sized cities in the United States have invested in bike share. Their experience shows that there is no single way to form, implement, or operate a bike share system. Cities build on the momentum created by those championing the idea, but political and staff support from city government is needed to formalize the concept and to provide credibility to the fundraising effort.

There are a number of risks that need to be addressed by the program. These include understanding that ongoing funding is required to maintain operations - most bike share systems are not financially

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self-sustaining from membership and usage fees alone. The automated bike share program needs to be clearly established as an expansion and complement to the Bike Library and not a replacement of that service. In this way, it is recommended that the two programs be combined into a single operating contract for an expanded Fort Collins Bike Library.

### Potential Bike Share System

Discussions with local stakeholders and the public led to the creation of a set of goals for a bike share system in Fort Collins. Serving as an east-west connector for MAX transit, maintaining high financial performance and sustainability, and providing access for economically disadvantaged populations were identified as high priorities. With these considerations in mind, a “heat mapping” exercise was conducted to identify areas with the highest potential demand and



with concentrations of underserved populations. From this analysis and the input received from the public, it was determined that an initial bike share system of approximately 20 stations should serve Downtown, Old Town, the CSU campus and the Elizabeth, Plum, and Lincoln corridors.

A proposed first phase could include stations located at:

#### Downtown / Old Town / Breweries

- Downtown Transit Center
- Library
- Discovery Museum
- Old Town Square
- Mountain MAX Station
- Lincoln Center
- Olive & College
- New Belgium Brewing
- Odell Brewing
- North College
- Poudre Valley Hospital

#### CSU and Surrounding Areas

- Laurel MAX Station
- University MAX Station
- CSU Transit Center
- South Campus
- Moby Center
- CSU Veterinary Hospital
- The Gardens on Spring Creek
- Campus West
- West Elizabeth

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## Business Model

A number of business models were considered for an enhanced Bike Library. However, a City-owned and managed system with a non-profit or private sector operator is recommended in Fort Collins. This is similar to how the City manages the existing Bike Library and would maximize funding flexibility, while providing full control over the operation and direction of the program. New City staff capacity would be needed to manage the system, particularly during the busy period leading up to launch.

## Funding Plan

Information from over a dozen cities operating established automated bike share programs was used to predict membership and ridership in Fort Collins. Based on this analysis, the program could expect approximately 1,000 annual members and 8,000 casual subscribers per year. Ridership is expected to be approximately 38,000 trips per year and the system is expected to recoup approximately \$1.1 million (42% of its operating cost) from membership and usage fees over the first five years of operation.

A 20-station (Phase 1) system will require approximately \$1.1 million for capital and installation, system start-up, and pre-launch administrative costs. Operating costs are expected to be in the order of \$2.6 million for the first five years of operations.

There are two possible funding tracks. The quickest, is to secure capital through local public funding – FC Moves has submitted a Budgeting for Outcomes (BFO) proposal to the City for capital funding of \$290,000 - and through direct contributions from CSU and other interested organizations and businesses. FC Moves has also submitted a BFO proposal to the City for approximately \$450,000 towards operation of the Bike Library and automated bike share system in 2015/2016. If this is approved, and renewed at slightly lower levels beyond 2016, it will leave approximately \$300,000 or \$60,000 per year to be raised by sponsorship of any remaining stations and potentially from an increase in the ASCSU student fees.

The longer-term funding track involves obtaining federal or state grant money, along with local matching funds, to use towards capital. Grants can take up to two years for the money to become available, pushing the possible launch date into at least 2016. Under this scenario, all other fundraising would go towards operations including user revenues, CSU funding sources, and sponsorship of the bikes and stations.

The base cost estimate assumes a smart dock system. The funding need could be reduced by considering different vendors and technologies. Smart bikes may offer cost advantages (they typically cost less per bike than smart dock systems) and offer the



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flexibility of being able to lock to standard bike racks, which can be arranged to replicate stations. However, these technologies have not been implemented on a large scale and may cost more to operate than smart dock technology. Other cost savings could come through operations, e.g., reducing the monthly operating cost by making use of existing staff, services, and facilities in the City, and by placing an emphasis on annual and casual membership recruitment.

### **Implementation**

The City of Fort Collins currently prohibits advertising in the public right-of-way. Further, the City's sign code limits what can be displayed on off-premise signage. Further follow-up with the City's legal department is necessary to better understand these policies and to develop a course of action to allow advertising and sponsorship.

Implementation of an automated bike share system is a detailed process that will require dedicated staff to handle procurement, funding, branding and marketing, site planning and permitting, deployment, operations, and launch. Funding is likely to be the critical path with the timeliness of capital funding largely unknown and sponsorship being required and often pieced together from multiple contracts with participating organizations.

### **Next Steps**

Near-term action items include:

1. Work with potential funding and fundraising partners (e.g., CSU, Kaiser Permanente).
2. Conduct preliminary work on station siting.
3. Follow up on advertising regulations and sign code to develop a course of action to allow advertising and sponsorship on the bikes and at the stations.
4. Advocate for funding through the BFO process.
5. Integrate bike share into the 2014 Bicycle Master Plan, including policy and infrastructure recommendations, as well as ongoing outreach.
6. Monitor and pursue grant opportunities.
7. Begin scoping for a Request for Proposals (RFP).

# Introduction

**24-HOUR ACCESS**

**ACTIVATION FEE**

**+**

**RIDE FEES**

Ride Duration	Ride Fee
0-15 min	\$0
15-30 min	\$5
30-45 min	\$10
45-1 hour	\$20
1-24 Hour	\$100

**7 DAY TRIAL**  
MEMBERSHIP

## 1 Introduction

The City of Fort Collins (the City) engaged Toole Design Group (TDG) to prepare a business plan for the possible implementation of a bike share system in Fort Collins, Colorado. The business plan follows over twenty years of bike lending programs in the City and several recent studies that explored the feasibility of introducing an automated bike share system to the existing bike lending offerings.

The most recent bike lending program is the Fort Collins Bike Library which currently allows residents and visitors to check out a bike free for the first day (with a \$10 fee for each additional day). Since 2008 the program has been funded by two Congestion Mitigation and Air Quality (CMAQ) grants as well as in-kind donations from the Downtown Development Authority (DDA), the City, and other community partners. The program is managed by the City and operated by Bike Fort Collins, a 501(c)(3) non-profit, and is staffed by employees and volunteers who provide safety information, helmets, maps, and locks along with bike check-outs. Since April 2008, the program has grown from 50 to 200 bikes and has recorded almost 20,000 bicycle checkouts by over 15,000 riders.<sup>1</sup>



Figure 1.1: Fort Collins Bike Library.

In 2012, with the original CMAQ funding for the Bike Library coming to an end, the City commissioned the *Bike Library Alternatives Analysis* study to evaluate options for bike share in Fort Collins. The study evaluated the following options including:

- Keeping the existing Bike Library.
- Expanding the existing Bike Library.
- Closing the Bike Library and adding an automated bike share system.
- Adding an automated bike share system and keeping the existing Bike Library.

The study recommended that the City move forward with implementing an automated bike share system and that the existing Bike Library be kept open during the implementation phase prior to a decision being made on its continued operation. The report described a number of challenges in operating the two systems together, but stated that “those might be minimized through careful marketing and system definitions that limit competition and overlap between the two systems”.

<sup>1</sup> Annual check-outs have increased from approximately 1,500 in 2008 to 4,600 in 2013.



The City subsequently approved the apportionment of \$80,000 annually from the 2013 and 2014 City budgets to extend operation of the Bike Library. In 2014, the Bike Library moved from its location in Old Town Square to the Downtown Transit Center.



Source: Boulder B-Cycle

Figure 1.2: Rider using Boulder B-Cycle.

In 2013, the City was awarded technical assistance from the Environmental Protection Agency's (EPA) Building Blocks for Sustainable Communities program to explore the feasibility of bike share in Fort Collins. The EPA study<sup>2</sup> concluded that Fort Collins "has many of the characteristics that are supportive of implementing a bike share system" and that an automated station-based system initially focused on the north end of the MAX line, Downtown Fort Collins, and CSU would complement the existing services offered by the Bike Library to offer a comprehensive set of bike share options in the City.

Since then, and when this project commenced, the City established a Bike Share Technical Advisory Committee (TAC) consisting of representatives from City departments, Transfort, public health, schools, businesses, and tourism. A list of organizations represented on the TAC is included in Appendix A. The TAC has continued building support for bike share and developed coordination among agencies and potential partners of the program. The TAC oversaw the development of this business plan to make

sure it represents the interests of a broad range of stakeholders in the region.

This Bike Share Business Plan was prepared at the same time as the City was developing its 2014 Bicycle Master Plan. The City has already achieved the platinum level Bicycle-Friendly Community designation by the League of American Bicyclists and is looking to upgrade to diamond status. Bike share could play an important role in that effort.

The Business Plan identifies an appropriate scale and phasing plan for the program, recommends an operating model that fits the goals of the community, and presents a financial pro-forma and funding plan for the program. The study also recommends the role and impact of the Bike Library. The goals of this Business Plan are to help focus bike share efforts in the City, to provide an implementation blueprint for partner agencies, and to provide a tool for attracting funding and support for the program.

*The intent of the business plan is to focus efforts in the City and to provide an implementation blueprint for partner agencies and a tool for attracting funding and support for the program.*

## 1.1 Business Plan Organization

The Fort Collins Bike Share Business Plan is organized into six sections as shown on **Figure 1.3**. Section 1 introduces the study, provides background on work to-date that has considered bike share in Fort Collins and sets the objectives of the Business Plan.

<sup>2</sup> United States Environmental Protection Agency, *Planning for Bike Share Programs, Fort Collins, CO – Next Steps Memorandum*. May 24, 2013.

Section 2 summarizes the case for a bike share program in Fort Collins. It outlines the potential economic, transportation, health, environmental, and safety benefits and challenges the program may face. It also presents the experiences of several case study cities including Denver, Boulder, and Aspen, all of which offer nearby examples of operating bike share systems.

Section 3 describes the planning process for developing the Bike Share System Plan. It outlines the process undertaken as part of this project, which included working with the TAC, an extensive public engagement process, and small-group meetings with local stakeholders. It outlines goals for the program, summarizes the results of a GIS demand analysis, and summarizes the input provided by the public and local stakeholders. The section concludes with a recommended system plan and phasing strategy.

Section 4 evaluates various business models that have been used to operate bike share programs in the United States and offers a recommendation on the most appropriate model for Fort Collins based on the local funding and political conditions. It includes a review of the role and involvement of the Bike Library.

Section 5 presents a financial analysis of the proposed program that compares potential costs and revenues and identifies a possible funding plan making use of public and private funding sources for capital and operation.

Implementation is considered in Section 6 and includes a possible timeline, advice on station permitting, and performance standards.

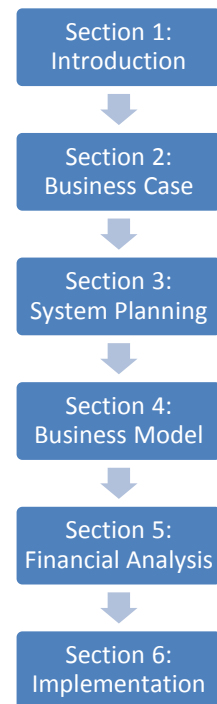


Figure 1.3: Business Plan Organization.



# Section 2 Business Case

## 2 Business Case

This section builds the case for bike share in Fort Collins. It introduces the concept of bike share and some of the potential benefits that bike share could bring to the City based on the experience of other jurisdictions in the United States. Several peer cities are explored in detail to better understand the successes and challenges that these cities faced in establishing bike share programs. Peer cities include Boulder and Aspen – established bike share systems in Colorado – as well as Madison, Wisconsin; Lansing, Michigan; and Chattanooga, Tennessee that highlight experience in other mid-sized towns with similar population sizes, a major university, and similar transit infrastructure. Because it is another established Colorado example, Denver was also explored.

### 2.1 What is Bike Share?

Bike share is an innovative transportation program, whereby system subscribers have access to public bicycles spread around the community. The system is accessed through low-cost subscriptions ranging from a few dollars for one day to between \$50 and \$100 for annual membership.

Some of the characteristics of bike share include:

- It is oriented to short-term, point-to-point use: most trips are between 15 to 20 minutes and one to three miles long.<sup>3</sup>
- The bicycle can be returned to any station, including the original check-out station.
- Generally, the bicycles are one style, sturdy, and easy to operate with custom components and adjustable seats.
- The rental transaction is fully automated and there is no need for on-site staff.

There are a number of bike share technologies available – the two most popular in the United States are the “smart dock” and “smart bike” systems shown on **Figure 2.2**.



Figure 2.1: Example of a Bike Share System in Chattanooga, Tennessee.

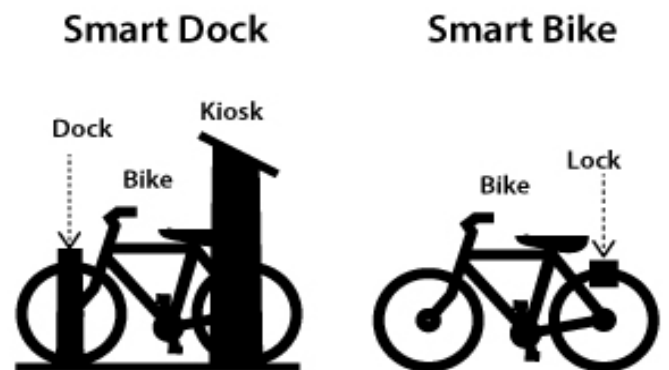


Figure 2.2: Recent Bike Share Technology Changes Include Smart Dock and Smart Bike Systems.

Source: Inventropolis.com

<sup>3</sup> *Bike Sharing in the United States: State of the Practice and Guide to Implementation*. Federal Highway Administration. United States Department of Transportation. September 2012.

### 2.1.1 Smart Dock Systems

Smart dock technology is developed around a computerized terminal where transactions and information are processed to release and lock the bikes from their docks. The components of station-based bike share systems are shown on **Figure 2.3** and include:

- Station: the collective grouping of the elements below.
  - Kiosk: the electronic terminal where all credit card transactions occur.
  - Informational panel: can be used to display maps, system information, or provide space for advertising.
  - Dock: the mechanism that holds the bikes. Each dock has a mechanized locking system that locks and releases the bikes.
  - Platform: the structure that holds the kiosk, information panel, and docks. Most systems utilize wireless technology and solar power so intrusion into the surface is not necessary and are modular, allowing various sizes and arrangements.
- Bicycle: is specifically designed for short trips and constructed of customized components to limit their appeal to theft and vandalism.
- Key: Radio Frequency Identification (RFID) cards or fobs allows users to check out a bike directly from the dock and speed up transactions. This also provides security and accountability to each transaction.

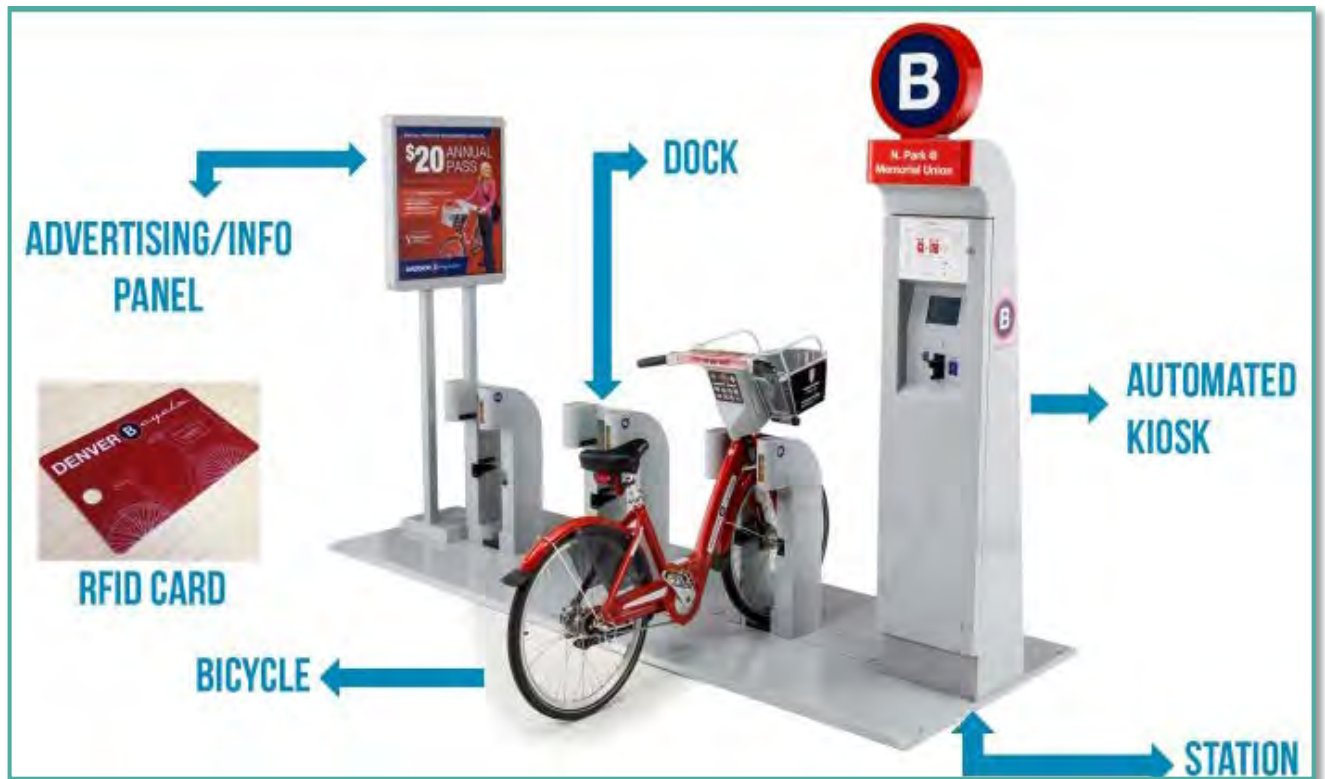


Figure 2.3: Components of a Smart Dock Bike Share System.

To release a bike from the station, a bike share member either swipes their membership key or uses a credit card; then, when they are ready, the member returns the bike to any station in the system's service area. The check-in and check-out transactions usually take a few seconds. Most systems allow subscribers to make as many trips as they want without additional charges, provided they return the bicycle to a station within 30-to-60 minutes. Operators generally begin to charge gradually increasing fees after this free period to discourage users from holding onto the bicycles and thus making the bicycles available to other subscribers. Therefore, bike share is ideal for short distance point-to-point trips.

### 2.1.2 Smart Bike Systems

Smart bike systems, such as the one shown on **Figure 2.4**, place the technology features (e.g., the transaction terminal, a locking mechanism and a GPS unit) on the bicycle itself. This allows the user more flexibility as to where to lock the bicycle – although likely special bike racks would be set up to replicate stations where the bikes would need to be returned. In general, smart-bike systems are cheaper on a per bicycle basis than station-based systems but remain largely untested in large-scale municipal systems.



Source: Social Bicycles

**Figure 2.4: Example of Technology Integrated into a Smart Bike System.**

### 2.1.3 Bike Share Implementation

As a transportation investment, bike share is relatively inexpensive. A 30 station / 300 bike system such as those in Chattanooga, Tennessee or Columbus, Ohio, costs approximately \$1.5 million to implement. This is less than one quarter of the cost of constructing a mile of new four lane urban highway.<sup>4</sup>



**Figure 2.5: Bike Share Station Lifted into Place in Chicago.**

Bike share systems are also relatively quick to implement. Systems have typically launched within two years of concept, although some cities have experienced delays from grant funding disbursement, equipment production, unexpected weather events, and other factors.

Typically, installation of stations is also relatively quick. Stations that utilize wireless and solar powered technology usually take less than two hours to install (see **Figure 2.5**). Systems utilizing AC powered technology to complement solar power technology can take longer to install and may incur increased installation costs.

<sup>4</sup> One mile of new four lane urban highway costs \$8 - \$10 million based on information from the American Road & Transportation Builders Association, accessed online at <http://www.artba.org/faqs/#20> on December 12, 2013.

## 2.2 Bike Share Benefits and Risks

Bike share is a relatively inexpensive and quick-to-implement transportation option that can deliver a variety of mobility, economic, health, environmental, and safety benefits. When combined with other modes of transportation, bike share can provide a fundamental shift in the way people move about and make decisions on transportation. For Fort Collins, bike share could be a means to:

- Expand and enhance existing and future transit services, such as the MAX bus rapid transit service.
- Reduce dependence on automobile transportation.
- Introduce new riders to the benefits of bicycling.
- Promote the City to potential employers, residents, and visitors.
- Provide an economic uplift to local businesses.
- Reduce household transportation expenditure.
- Improve physical and mental health and reduce health care costs.
- Reduce greenhouse gas emissions.

These benefits are described in more detail in the sections below along with potential opportunities and risks.

### 2.2.1 Mobility and Transportation Benefits and Risks

Bike share is a mobility option. Bike share trips tend to be short – between one to two miles in length and about 20 minutes in duration. As a result, they provide an option for planned or spontaneous trips that are too far to walk or too short to wait for transit. They also provide a first-mile / last-mile option to access public transit and could be an effective east-west connection to and from stations along the new MAX bus rapid transit line.

Many bike share users combine membership in a bike share program with transit, car-share, walking, and other transportation options to reduce their dependence on automobile transportation. In some places, this has resulted in a fundamental shift in trip-making and household vehicle ownership.

Bike share's ability to reduce some of the common barriers to entry, e.g., allowing new users to try bicycling without needing to own or store a bicycle, as well as the design of the bicycles and the visibility of the stations has a significant impact in attracting new riders. The addition of more bicyclists could provide the impetus for further investment in bicycling facilities and support the goals of the 2014 Bicycle Master Plan.

The following is a summarized version of the mobility and transportation benefits of bike share:

- Augments a community's existing transit system.
- Relieves already over-capacity transit services.
- Encourages active transportation by lowering barriers to entry.
- Provides the impetus for further investment in bicycling facilities.
- Connects places including university and commercial campuses.

**2/3** of Citi Bike users (New York City) link their bike share trips with transit. The system provides a first- and last-mile connection in areas currently under-served by mass transit.

**54%** of Capital Bikeshare members (Washington, D.C.) stated that at least one of their bike share trips in the previous month had started or ended at a Metrorail station.

**33%** of new members of Nice Ride Minnesota (Minneapolis) had ridden less than once per month before joining.

## Funding Opportunity

Recognizing that transit agencies are important partners, the Federal Transit Administration (FTA) provided some funding to various existing systems including in Boston and Chattanooga. To be eligible for FTA funding, stations must be within a three-mile radius of transit and funds can only be used towards bike share docks, equipment and other capital costs (the cost of the bikes and operating costs are not currently eligible).<sup>5</sup>

## Mobility Risks

In existing bike share programs, 20 to 40 percent of bike share trips have been known to replace single occupancy vehicle trips,<sup>6,7</sup> although a full, holistic analysis of the impact of bike share on public transit and active transportation has not been undertaken. With this in mind, some bike share trips may detract from other public transit or active transportation trips as well as from existing demand at the Bike Library.

### 2.2.2 Economic Benefits and Risks

There are a number of economic benefits that bike share may bring at the community, business, and individual level:

- At the **community** level, bike share is seen by many cities as part of their revitalization efforts and recognized as a means for attracting or retaining workforce talent. There are a small number of local jobs created to operate and maintain the system. Bike share also provides visitors with a unique way to experience the city and a means to attract visitors and their spending power to a city.
- For **businesses and employers**, the benefits include:
  - *Increased economic activity* - In other cities, businesses located near bike share stations have seen an economic uplift.<sup>8</sup>
  - *Increased bicycle sales* - There is evidence that bike share can have a positive effect on bicycle retail with increased sales of private bicycles and accessories.<sup>9</sup>
  - *Increased Travel Demand Management strategies* - Corporate membership packages could be offered as part of a company's travel demand management program or as an employee benefit.



Figure 2.6: Bike Share Station Outside a Local Business in Minneapolis.

<sup>5</sup> Federal Transit Administration's *Frequently Asked Questions and Answers Concerning Bike Sharing Relative to the United States Department of Transportation*. Accessed online at [http://www.fta.dot.gov/documents/Informal\\_Q\\_and\\_As\\_Final\\_6-14-12.pdf](http://www.fta.dot.gov/documents/Informal_Q_and_As_Final_6-14-12.pdf) on December 26, 2013.

<sup>6</sup> National League of Cities (2011) *Integrating Bike Share Programs into a Sustainable Transportation System*.

<sup>7</sup> Nice Ride Minnesota (October 2011) *Presentation about Nice Ride Minnesota*.

<sup>8</sup> Schoner, J.E., Harrison, A. and Wang, X. (2012). *Sharing to Grow: Economic Activity Associated with Nice Ride Bike Share Stations*. Humphrey School of Public Affairs, University of Minnesota.

<sup>9</sup> Bike Europe (2007). *Strong Shifts in 2007 French Market*. Accessed online at <http://www.bike-eu.com/Home/General/2008/4/Strong-Shifts-in-2007-French-Market-BIK002778W/> on December 3, 2013.



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- *Increased marketing opportunities* - Sponsorship or advertising opportunities are typically available on the stations and bikes. This can range from one large system sponsor to many smaller station-based sponsors. By providing increased marketing opportunities, businesses can help increase their visibility throughout a particular region.
- For **individuals**, bike share can reduce household expenditure on transportation and health care, which combined make up over 22 percent of annual average household expenditure in the United States.<sup>10</sup> Bike share membership is relatively inexpensive with most programs costing between \$50 and \$100 per year. In comparison, the median cost of annual car ownership is approximately \$9,100.<sup>11</sup>

### **Economic Risks**

There are some economic risks related to a bike share system:

- Most bike share systems are not economically self-sustaining, i.e., operating costs are greater than membership and usage fees. Therefore, the responsible organization (e.g., public agency, non-profit, or private company) must ensure that the requisite funding is available to support capital purchases, expansion, and ongoing operations.
- Throughout communities with existing bike share systems there have been initial doubts about the effects of bike share on local bicycle rental businesses. Several actions can be taken to reduce this risk including developing a price structure that deters long term rental of the bike share bikes and identifying bike rental and retail locations on the station maps.
- There could be some competing demand between users of the Bike Library and an automated bike share system. This is addressed in the Market Analysis section below.

### **2.2.3 Health Benefits and Risks**

Bike share can have a positive impact on both physical and mental health. The physical health benefits of cycling are well documented and relate to helping address preventable diseases such as obesity, heart disease, and diabetes. Bike share is a means for people to incorporate active transportation into their daily lives and lower medical and health care costs. Bicycling for 30 minutes a day, such as using bike share to go to and from work each day, can reduce the risk of heart disease by 82 percent<sup>12</sup> and reduce the risk of diabetes by up to 58 percent.<sup>13</sup>

Bike share can also have a positive impact on mental health. Users in other cities have expressed that bike share has positively contributed to an improved outlook, increased recreation, and improved sociability.

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<sup>10</sup> U.S. Department of Labor, Bureau of Labor Statistics, *Consumer Expenditure Survey*, 2010.

<sup>11</sup> For comparison, the median annual cost of car ownership is approximately \$9,100 based on information from [www.consumerreports.org](http://www.consumerreports.org) accessed on December 12, 2013.

<sup>12</sup> British Medical Association (1992). *Cycling Towards Health and Safety*. Oxford University Press.

<sup>13</sup> Lindström, J. et al. *The Finnish Diabetes Prevention Study: Lifestyle intervention and 3-year results on diet and physical activity*. *Diabetes Care*, December 2002, vol. 26 no. 12 3230-3236. Accessed online at <http://care.diabetesjournals.org/content/26/12/3230.full> on December 13, 2013.

## Health Risks

Safety is a large concern for bike share users. This risk is described more in the Safety Benefits section below.

## Funding Opportunity

The health benefits of bike share are recognized by the health care industry. The federal government, through the Center for Disease Control (CDC), has funded several different systems including those in Boston and Nashville. The private sector is also represented with many bike share systems in the United States supported by health care providers such as Blue Cross Blue Shield (Nice Ride Minnesota) and Kaiser Permanente (Denver B-Cycle) through partnerships and sponsorships.



Figure 2.7: Bike Share Users in Salt Lake City.

### 2.2.4 Environmental Benefits and Risks

Bike share can have an impact on reducing greenhouse gas emissions by replacing trips taken previously by automobile. These impacts can be multiplied when bike share is used in combination with transit and other modes to reduce dependence on automobile use, change travel patterns, and increase environmental consciousness.

Other cities have reported rates anywhere between 20 and 40 percent of annual member bike share trips replacing automobile trips.<sup>14,15,16</sup> A 2011 study of Capital Bikeshare in Washington D.C. showed that bike share trips had replaced approximately 4.4 million vehicle miles,<sup>16</sup> representing a four percent decrease in the city's annual driving mileage.<sup>17</sup> In its first season of operation, Denver B-Cycle users took over 100,000 trips and rode more than 200,000 miles. A survey of members showed that over 40 percent of trips replaced a vehicle trip, avoiding over 300,000 pounds of greenhouse gas emissions.<sup>18</sup>

Bike share helps to increase environmental consciousness for both individuals and communities. For individuals, most bike share systems offer member logins where people can track the amount of greenhouse gas emissions avoided through their bike share trips. Employers can use these statistics to help track the organization's greenhouse gas emission reductions.

<sup>14</sup> Two-thirds of members also said they had increased their amount of bicycling since joining Nice Ride. Figures taken from *Nice Ride 2010 Annual Report*.

<sup>15</sup> Nice Ride Minnesota Annual Report 2011. Accessed online at: [https://www.niceridemn.org/\\_asset/9n2z8n/](https://www.niceridemn.org/_asset/9n2z8n/)

<sup>16</sup> LDA Consulting (2012). *Capital Bikeshare 2011 Member Survey Report*. Accessed online at <http://capitalbikeshare.com/assets/pdf/Capital%20Bikeshare-SurveyReport-Final.pdf> on December 3, 2013.

<sup>17</sup> Federal Highway Administration, *Highway Statistics 2011: Urbanized Areas – 2010 Miles and Daily Vehicle – Miles Traveled*. Accessed online at <http://www.fhwa.dot.gov/policyinformation/statistics/2011/hm71.cfm> on December 27, 2013.

<sup>18</sup> National League of Cities (2011) *Integrating Bike Share Programs into a Sustainable Transportation System*.

## Environmental Risks

A major part of bike share operations is balancing the system – that is, moving bicycles around from full stations to empty stations to ensure balance between full and empty docks and the availability of bicycles throughout the system. Typically, this operation is undertaken by vans. Because of the relatively high cost and low availability of non-GHG rebalancing options, there are few operations that utilize electric or other environmentally friendly vehicles. There have been no studies on the emissions of such vehicles, or other aspects of operations, on the overall environmental impact of a bike share system. However, this negative impact should be noted.

### 2.2.5 Safety Benefits and Risks

Safety is a significant concern to bike share partners and users. Although still relatively new, bike share has an extremely impressive safety record. To date, no system in the United States has recorded a fatality and the rates of injury crashes are generally lower than private bicycling.<sup>19</sup>

#### Safety Benefits

The safety benefits of bike share include:

- *“Safety in Numbers”* - Safety in numbers is a well-established phenomenon and a study published in Injury Prevention in 2003 showed that the “likelihood of a person walking or bicycling being struck by a motorist varies inversely with the amount of walking and bicycling.”<sup>20</sup>
- *Increased education opportunities* - More opportunities to communicate with bicyclists about road rules and safety hints through safety messaging provided on the stations, on the handlebars of the bikes, on the program website, via social media, and through press releases and articles.
- *Built in safety features* - Introducing bikes with built in safety features that are professionally maintained in good repair. Some of the features of bike share bikes are shown on **Figure 2.8** and include:
  - Built-in safety features such as front and back lights, brakes, and reflectors.
  - An upright position of the rider.
  - A heavy bike (typically 40-45 lbs) with wide handlebars that promotes slower speeds.

#### Safety Risks

Many communities have had concerns about safety prior to implementation, including:

- Low number of available bicycle infrastructure for safe cycling.
- Introduction of inexperienced riders to the streets.
- Low helmet usage rate among bike share users (a study of bike share trips in Boston and Washington D.C. showed that less than 20 percent of bike share riders wore a helmet).<sup>21</sup>

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<sup>19</sup> The Nice Ride, Citibike, and Capital Bikeshare systems combined observed an injury crash rate of 11.5 injuries per million person trips. Injury rates for private bicycling are approximately 14.6 injuries per million person trips - obtained from: Beck, L. et al. (2007). *Motor Vehicle Crash Injury Rates by Mode of Travel, United States*. Published in the American Journal of Epidemiology.

<sup>20</sup> Jacobsen, P.L. (2003). *Safety in Numbers: More Walkers and Bicyclists, Safer Walking and Bicycling*. Injury Prevention 2003;9:205-209.

<sup>21</sup> Fischer, C.M. et al. (2012). *Prevalence of Bicycle Helmet Use by Users of Public Bikeshare Programs*. Published in the Annals of Emergency Medicine, Vol. 60, Issue 2, pp. 228-231.

- Pedestrian concerns of riders breaking rules such as riding on the sidewalk or against traffic (particularly for the elderly pedestrian population).

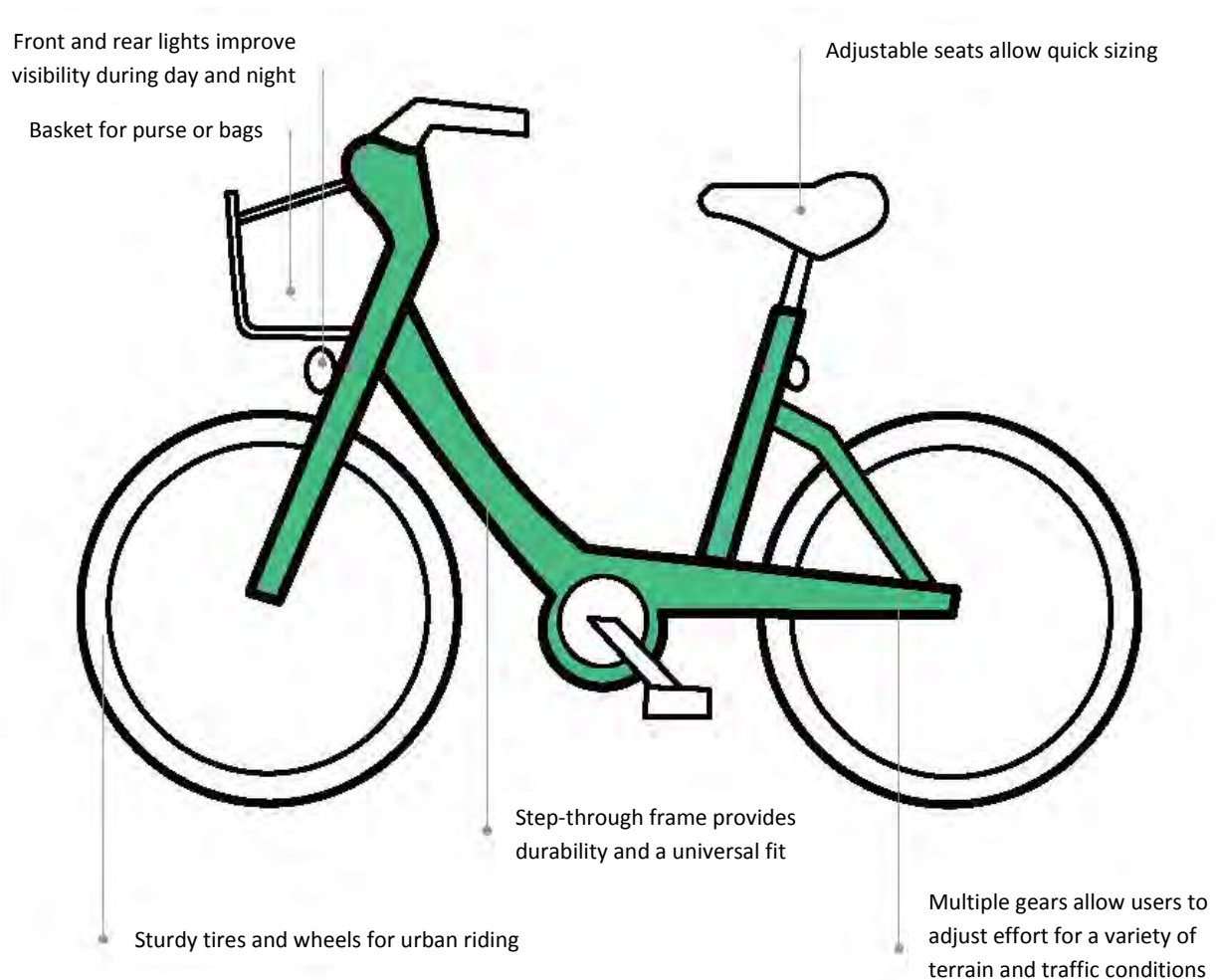


Figure 2.8: Safety Features of Bike Share Bike.<sup>22</sup>

### 2.3 Comparable Cities

Most of the major North American bike share systems launched after 2010. This included three cities in Colorado – Boulder, Denver, and Aspen. These cities offer excellent examples of establishing and operating bike share systems in Colorado. In addition, Madison, Wisconsin and Chattanooga, Tennessee were reviewed as they are similarly sized to Fort Collins, have similar relationships with a major university and feature similar transit infrastructure.

Characteristics of these systems are summarized in **Table 2.1** from which several themes emerge:

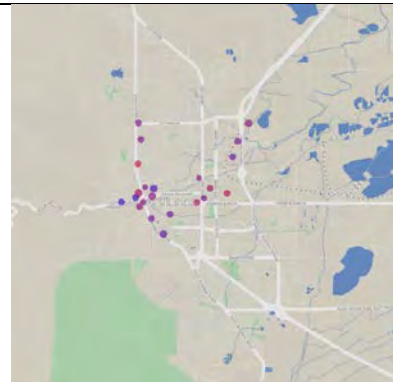
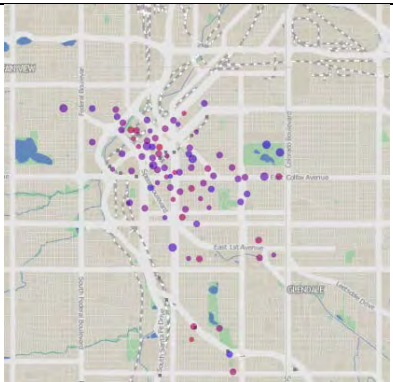
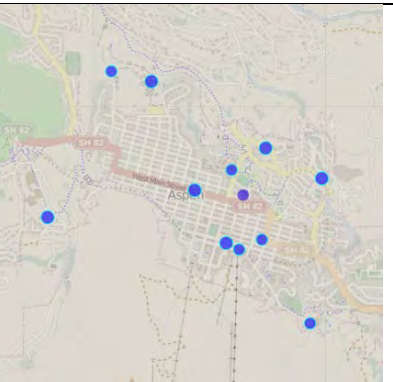
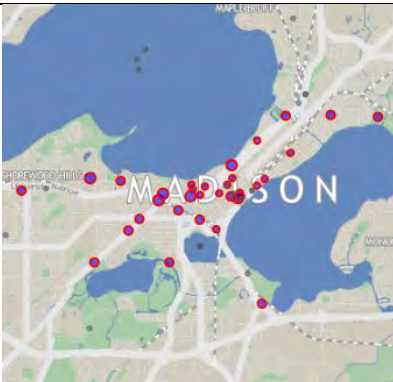
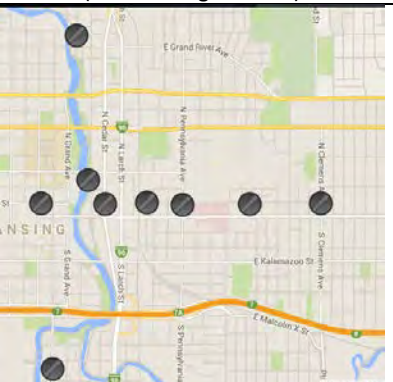
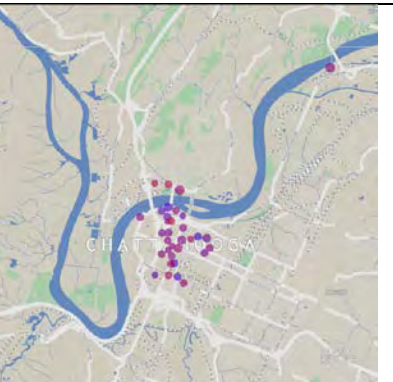
<sup>22</sup> Atlanta Bicycle Coalition (2013). *Atlanta – Decatur Bike Share Feasibility Study*. Accessed online at: [http://issuu.com/atlantabike/docs/atl-dec\\_bikeshare\\_book\\_lowres#](http://issuu.com/atlantabike/docs/atl-dec_bikeshare_book_lowres#) on January 2, 2014.

- The **population size** of cities implementing bike share systems ranges dramatically. Early experience in the United States included mainly large cities such as Denver, Boston, and Minneapolis. However, more recently small and mid-sized communities such as Aspen and Boulder have entered the bike share market and are seeing competitive ridership and membership statistics; many of these systems have undergone or are preparing to expand.
- **Station densities** vary from four to six stations per square mile within the service area. Higher station densities are generally recommended to allow people to be in close proximity to a station no matter where they are. However, providing stations in close proximity to key destinations, such as the breweries in Fort Collins, may not require significant adjacent densities. The overall size of the system should be large enough that biking is a necessary choice (as compared to simply walking between destinations).
- **System size** varies with most systems being larger than 100 bikes. Typical ratios are between seven and nine bicycles per station. In all systems a significant number of additional docks are provided so that users have a place to park a bike. Typical ratios range from 1.7 to 1.9 docks per bicycle depending on the local needs and the expectations to balance capital costs with redistribution requirements. Higher dock ratios, e.g., 1.9 docks per bike, are more costly upfront but reduce operating costs by requiring less frequent rebalancing.
- The **user fee structure** should reflect the intended goals of the program. All of the case study cities offer relatively inexpensive annual membership fees to attract local riders (in Colorado this is roughly proportional to population size). The price of shorter membership options, such as 7-day and 24-hour passes varies between communities. Usage fee structures are set depending on the goals of the program. All of the cities with existing programs selected for each case study offer a “free ride” period - 30 minutes in Denver and Aspen and 60 minutes in Boulder – after which time, additional usage fees are charged. Fees vary from \$1 per half hour to \$5 per quarter hour. The fee structure in Aspen is higher than in Boulder and Denver and is an attempt to discourage the use of the bicycles for longer trips and to protect the local bicycle rental market.
- The systems in Boulder and Denver **operate** year-round, but only between 5 a.m. and midnight, whereas the system in Aspen is removed for winter once the snowfall starts but operates 24-hours per day. Denver has only recently begun year-round operations starting in the winter of 2013/2014.

Performance data for the peer city bike share systems are shown on **Table 2.2** and includes 2012 or 2013 data for each system. Depending on the system, this represents first, second or third season data.

In terms of membership draw, Aspen has been extremely successful in attracting a high number of annual members relative to the population of the city. Boulder and Madison have also had good success. High membership rates could be the result of creating strong partnerships in the local community, frequent local media coverage, and early membership drives to support the system. The high number of visitors and tourists to Boulder and Denver drives their high casual membership. Fort Collins could expect to see relatively high rates of annual membership uptake based on these comparisons (the average of the peer cities represents an uptake rate of approximately 6 members / 1,000 population) and casual membership (Fort Collins could expect to draw up to 400 casual members per station per year).

Table 2.1: Bike Share Case Study System Characteristics<sup>23</sup>

	<b>Boulder B-Cycle</b> (started: May 2011)	<b>Denver Bike Sharing</b> (started: April 2010)	<b>WE-Cycle, Aspen</b> (started: April 2013)	<b>Madison B-Cycle</b> (started: 2011)	<b>Capital Community Bike Share, Lansing, MI</b> (started: August 2013)	<b>Chattanooga Bike Transit System</b> (started: July 2012)
						
<b>Data Year</b>	2012 (2 <sup>nd</sup> season)	2012 (3 <sup>rd</sup> season)	2013 – partial (1 <sup>st</sup> season)	2013 (3 <sup>rd</sup> season)	2013 – partial (1 <sup>st</sup> season)	2012 / 2013 (1 <sup>st</sup> season)
<b>Population</b>	102,000	634,000	7,000	240,000	114,000	171,000
<b>System Characteristics</b>	22 stations 150 bikes 279 docks	81 stations 709 bikes 1,219 docks	13 stations 100 bikes 171 docks	35 stations 290 bikes 484 docks	4 “station” – smart bike system 20 bikes 40 racks	31 stations 300 bikes 547 docks
<b>Service Area</b>	4.8 sq. mi.	12.7 sq. mi.	-	-	-	5.15 sq. mi.
<b>System Ratios</b>	4.6 stations / sq. mi. 6.8 bikes / station 1.86 docks / bike	4.1 stations / sq. mi. 8.75 bikes / station 1.72 docks / bike	7.7 bikes / station 1.71 docks / bike	8.3 bikes / station 1.67 docks / bike	5 bikes / station 2 racks / bike	6.0 stations / sq. mi. 9.7 bikes / station 1.82 docks / bike
<b>Membership Cost</b>	\$65 annual \$20 weekly \$7 24-hour	\$80 annual \$30 30-day \$20 7-day \$8 24-hour	\$55 annual \$25 7-day \$15 3-day \$7 24-hour	\$65 annual \$5 24-hour	\$80 annual \$5 24-hour	\$75 annual \$6 24-hour
<b>Trip Fees</b>	First 60 minutes free \$4.50 / additional half hour	First 30 minutes free \$1.00 second half hour \$4.00 / additional half hour	First 30 minutes free \$2.00 for next quarter hour \$5.00 / additional quarter hour	First 30 minutes free \$2.00 for second half hour \$5.00 / additional half hour	First 30 minutes free \$2.00 / additional half hour	First 60 minutes free \$5.00 / additional half hour
<b>Operating Practices</b>	Year-round, 5am to midnight	Year-round, 5am to midnight	Removed for winter, 24-hours a day	Removed for winter, 5am to midnight	Removed for winter, 24-hours a day	Year-round, 24-hours a day
<b>Average High Temperatures</b>	88 F (summer) / 45 F (winter)	88 F (summer) / 46 F (winter)	79 F (summer) / 35 F (winter)	83 F (summer) / 28 F (winter)	83 F (summer) / 30 F (winter)	90 F (summer) / 50 F (winter)
<b>Average Monthly Precipitation</b>	1.8” (summer) / 0.9” (winter)	2” (summer) / 0.8” (winter)	1.9” (summer) / 2.3” (winter)	4.8” (summer) / 2.1” (winter)	3.4” (summer) / 1.6” (winter)	4.9” (summer) / 4.9” (winter)

<sup>23</sup> Maps taken from screenshots of <http://bikes.oobrien.com/global.php> and <https://www.a2bbikeshare.com/stations/map?system=1>

Table 2.2: Performance Metrics for Case Study Bike Share Systems

	<b>Boulder B-Cycle</b> (started: May 2011)	<b>Denver Bike Sharing</b> (started: April 2010)	<b>WE-Cycle, Aspen</b> (started: April 2013)	<b>Madison B-Cycle</b> (started: 2011)	<b>Chattanooga Bike Transit System</b> (started: July 2012)
System Characteristics	22 stations 150 bikes 279 docks	81 stations 709 bikes 1,219 docks	13 stations 100 bikes 171 docks	35 stations 290 bikes 484 docks	31 stations 300 bikes 547 docks
<b>DATA CHARACTERISTICS</b>					
Data for the Period	2012 (2 <sup>nd</sup> season)	2012 <sup>24</sup> (3 <sup>rd</sup> season)	2013 - partial (1 <sup>st</sup> season)	2013 (3 <sup>rd</sup> season)	Aug 2012 – July 2013 (1 <sup>st</sup> season)
Days in Operation	250	278	148	269	365
<b>MEMBERSHIP CHARACTERISTICS</b>					
Casual Members	9,059	39,706	1,876	15,367	8,578
Annual Members	869	2,734	285	1,843	696
<b>RIDERSHIP CHARACTERISTICS</b>					
Casual Trips	11,786	-	4,917	28,694	-
Annual Member Trips	13,568	-	5,118	52,968	-
Total Trips	25,354	206,974	10,035	81,662	32,000
<b>PERFORMANCE METRICS</b>					
Annual Members / 1,000 Population	8.5	4.3	40.7	7.7	4.1
Casual Members / Station	410	749	144	439	275
Trips per Casual Member	1.3	-	2.6	1.9	1.8
Trips per Annual Member	15.6	-	18	28.7	23.3
Trips per Bike per Day	0.81	1.4	0.68	1.05	0.29
Farebox Recovery <sup>25</sup>	36%	40%	-	-	26%

Note: Ridership and financial data not available for Capital Community Bike Share.

The number of trips made per bicycle per day (a common metric used to compare ridership between systems) varies from 0.3 trips per bicycle per day to 1.4 trips per bicycle per day (an average of approximately 0.8 trips per bike per day) and is representative of other small and mid-size cities operating bike share. Larger systems, such as those in Boston, Washington, D.C., and New York observe trip rates of 3 to 4 trips per bicycle per day.

Financial information is not available for all cities; however, Chattanooga, Boulder and Denver operate systems in which revenues from membership and usage fees cover between 25 percent and 40 percent of the cost to operate the system (farebox recovery). Other operating revenues come from sponsorship, gifts/contributions, and other sources.<sup>26</sup>

<sup>24</sup> 2012 Operating data based on system size of 53 stations and 520 bicycles.

<sup>25</sup> Farebox recovery is the amount of operating cost recouped by membership and usage charges.

<sup>26</sup> Boulder B-Cycle 2012 Annual Report.

**Table 2.3** summarizes the business models and funding strategies for the case study cities in Colorado, Madison, and Chattanooga. These examples show that there is no single optimum way to form, implement, or operate a bike share system. In all cases, cities have built on the momentum created by those championing the idea. In some instances this is a grass-roots community group (such as in Boulder and Aspen<sup>27</sup>), a city department (as in Chattanooga and Columbus), a transit agency (as in Fort Worth), a business improvement association (such as in Salt Lake City), or the private sector (as in Madison). All systems need the support of city government, and, in particular, programs have tended to be most successful (especially in obtaining capital and sponsorship dollars) when there has been early and visible mayoral support for the program.

**Table 2.3: Case Studies of Small Community Bike Share Systems in the United States**

	Boulder B-Cycle	Denver Bike Share	WE-Cycle, Aspen	Capital Community Bike Share	Chattanooga Bike Transit System
<b>BUSINESS MODEL</b>					
<b>Impetus Driven By</b>	Local community group	Local champions driven by Mayoral support	Local champions	Local champions	City
<b>Ownership</b>	Non-Profit	Non-Profit	City and County	Non-Profit	City
<b>Contract Administrator</b>	-	-	-	Non-Profit	City
<b>Operator</b>	Non-Profit	Non-Profit	Non-Profit	Public / Private	Private
<b>City Role</b>	Funding agent, federal / state grant agent, Board representation, planning	Political support, grant funding partner, Board representation	Grant funding, founding partner, planning	Funding partner, Board representation, installation, repair, maintenance	Owner, administrator, fundraising, planning
<b>Transit Agency Role</b>	Project partner	Project partner	Founding partner, planning	Project partner	Federal grant agent, station planning
<b>FUNDING</b>					
<b>Capital</b>	City pursues federal, state, local grants; BBC fundraises local match	DNC Remaining funds, federal and state grants, local match	Federal grants, contributions, donations	Donations, grants, memberships	Federal grant
<b>Operations</b>	Membership and usage fees (35%); sponsorship; local funds	Membership and usage fees (40%); sponsorship; contributions	Membership and usage fees; sponsorship	Membership and usage fees	Membership and usage fees (25%) and sponsorship

There is no one specific business model for small to mid-sized communities such as Fort Collins. However, the involvement of a non-profit organization has been the most common model throughout existing systems in communities of this size, in part due to the community-minded mission of these organizations, and the fact that large, sophisticated (and potentially expensive) operations are not necessary for a smaller system. Non-profit organizations tend to also be well-positioned to receive funding from a variety of sources, however in most cases they rely on the city or transit agency to identify, seek, and disburse federal, state, or local grants for capital funding. The responsibility for local matches can fall to either the public agency, the non-profit organization, or both.

<sup>27</sup> The WE-Cycle system in Aspen, Colorado was also established through the grass-roots efforts of local champions of the concept.



Membership and user fees can be expected to cover only a portion of the operating cost (35 percent to 40 percent in existing Colorado systems). The remaining costs are typically supplemented by other sources – in particular from sponsorship and advertising. Smaller markets tend to attract numerous smaller sponsors rather than a few large ones. This means a larger allotment of time and effort is required to identify, commit, and retain sufficient sponsorship to make the system financially sustainable.

### 2.3.1 Boulder B-Cycle

Boulder B-Cycle is a public-private partnership between the City of Boulder and a non-profit organization that owns and operates the system. Boulder B-Cycle was formed by individuals interested in bringing bike share to the city.<sup>28</sup> The system initially launched in May 2011 with 85 bicycles at 12 stations and has since expanded to 150 bicycles at the 22 stations shown on **Figure 2.9**. In 2012, Boulder B-Cycle had 869 annual members and over 9,000 casual users and recorded over 25,000 rides.<sup>29</sup>

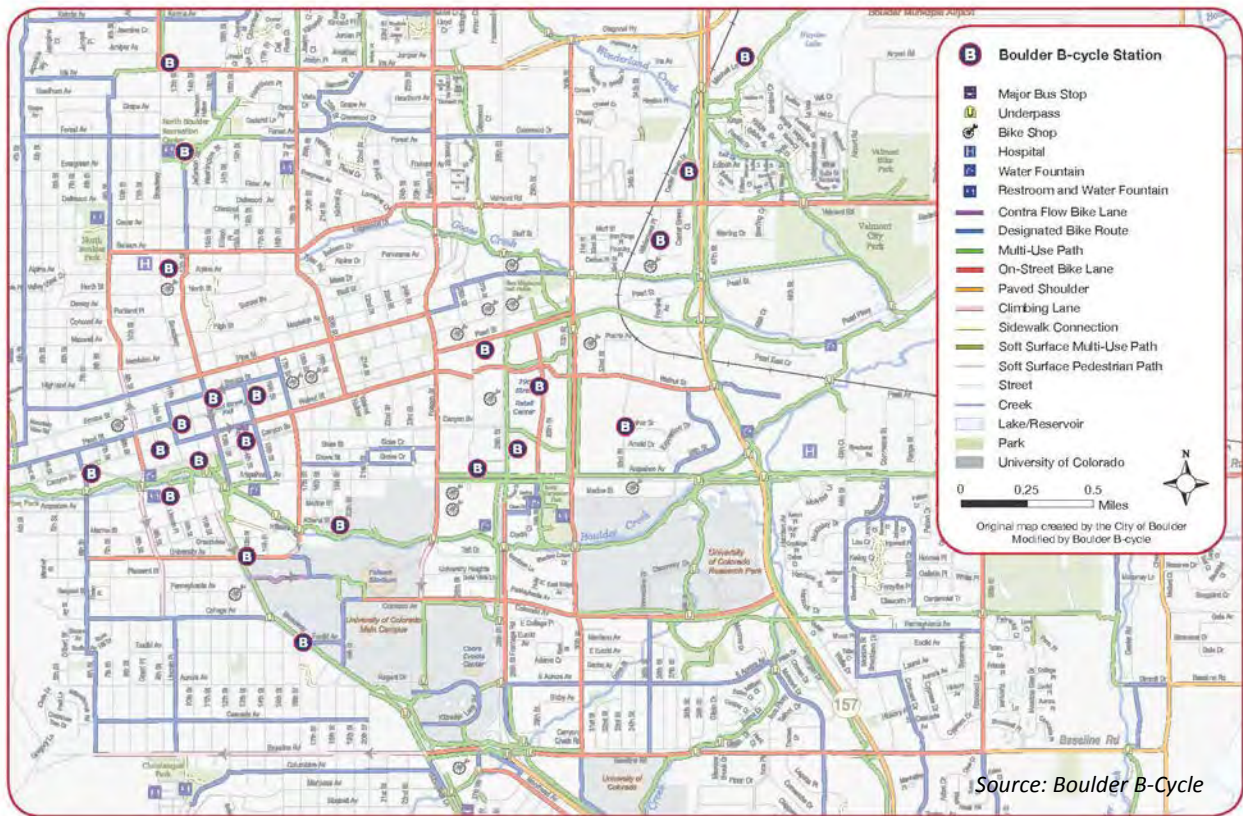


Figure 2.9: Boulder B-Cycle System Map.

Capital funding was obtained through a combination of federal, state, and local government grants and gifts from individuals and businesses in the community. The City of Boulder is a major partner and has an agreement with Boulder B-Cycle to pursue grant funding for capital expansion with Boulder B-Cycle responsible for securing

<sup>28</sup> Momentum Magazine (September 23, 2013). *Bike Share Finds Success in Small Cities*. Accessed online on December 5, 2013 at <http://momentummag.com/features/bike-share-finds-success-in-small-cities/>.

<sup>29</sup> Boulder B-Cycle (July 2013). *Boulder B-Cycle – 2012 Annual Report*. Accessed online on December 5, 2013 at <https://boulder.bcycle.com/About/DataandReports.aspx>.

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any local match. As of June 2013, the City had contributed \$330,800 of city funds and disbursed \$332,733 of state and federal grants to purchase 18 of the 22 stations. The additional four stations were funded through the Boulder County Capital Improvement Fund (2 stations), a grant from the University of Colorado student group (1 station), and contributions from a private property owner (1 station).<sup>30</sup>

The program is set to expand to 38 stations and 280 bicycles through a Federal Highway Administration (FHWA) Transportation, Community, and System Preservation (TCSP) grant secured by the City. Local matching funds are fundraised by Boulder B-Cycle through grass-roots campaigns targeted towards individuals and businesses in the community and businesses and property owners adjacent to the stations.

Operating expenses are covered by a combination of membership and usage fees as well as sponsorships. As is the case in many smaller cities, Boulder B-Cycle has had reasonable success with sponsorship requests in the \$1,000 to \$10,000 range where decisions can be made by the local office of the business. They have also had success with contributors in the \$10,000 to \$50,000 range that require regional or national approval, and recently announced that Kaiser Permanente will become the “presenting sponsor” of the program.<sup>30,31</sup>

### 2.3.2 Denver Bike Sharing

Denver was one of the first cities to launch bike share in the United States. The system was funded as a legacy project with remaining funds from the 2008 Democratic National Convention and launched on Earth Day in 2010 with 50 stations and 500 bicycles. The system is owned and operated by Denver Bike Sharing, a 501(c)(3) non-profit organization established specifically for the purpose of administering the bike share program.<sup>32</sup>

Through a combination of grants from the FHWA’s Transportation Community and System Preservation Program (TCSP) and Funding Advancement for Surface Transportation and Economic Recovery Source (FASTER) awarded by CDOT, local matching funds coming from private contributions, and several individual station funders, the system recently expanded to 81 stations and over 700 bikes as shown on **Figure 2.11**.<sup>33</sup> Operating revenue comes from a combination of membership (35%), usage fees (18%), sponsorships (44%), and gifts/contributions (3%).

### 2.3.3 WE-Cycle, Aspen

WE-Cycle is a relatively recent system which opened in June 2013 with 100 bicycles at 13 stations in Downtown Aspen and throughout various attractions throughout the Roaring Fork Valley, as shown on **Figure 2.12**. Capital funding for the program came from a CMAQ grant, contributions from founding partners, private donations, and an adopt-a-bike campaign. By way of the

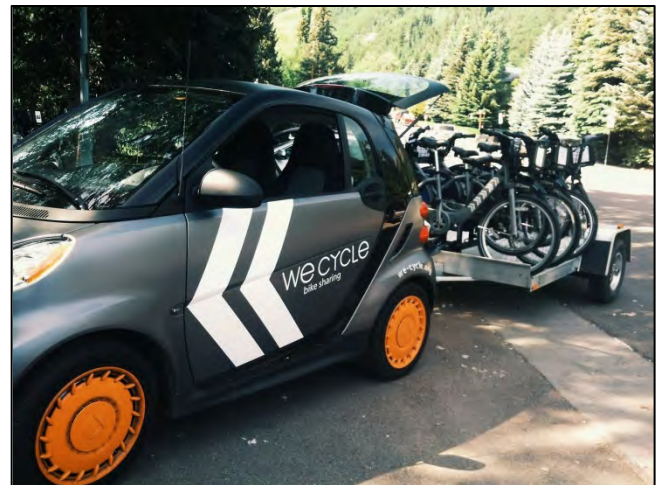


Figure 2.10: WE-Cycle Redistribution Vehicle.

<sup>30</sup> Boulder B-Cycle (August 2013). *Station Master Plan*. Accessed online on December 5, 2013 at <https://boulder.bcycle.com/About/DataandReports.aspx>.

<sup>31</sup> Boulder County Business Report, *Boulder B-Cycle Adding Bicycles, Stations*. Accessed online at <http://bcbr.com/apps/pbcs.dll/article?AID=/20140319/NEWS/140319910&source=RSS> on March 31, 2014.

<sup>32</sup> Denver Bike Share. Accessed online at <https://denver.bcycle.com/about/ourstory.aspx> on January 24, 2014.

<sup>33</sup> Denver Bike Share *2012 Annual Report*.

Source: WE-Cycle

CMAQ grant, the stations are owned by the City of Aspen and Pitkin County. However, the program is operated by WE-Cycle, a non-profit organization that funds operations using a combination of memberships, user fees, and sponsorships.

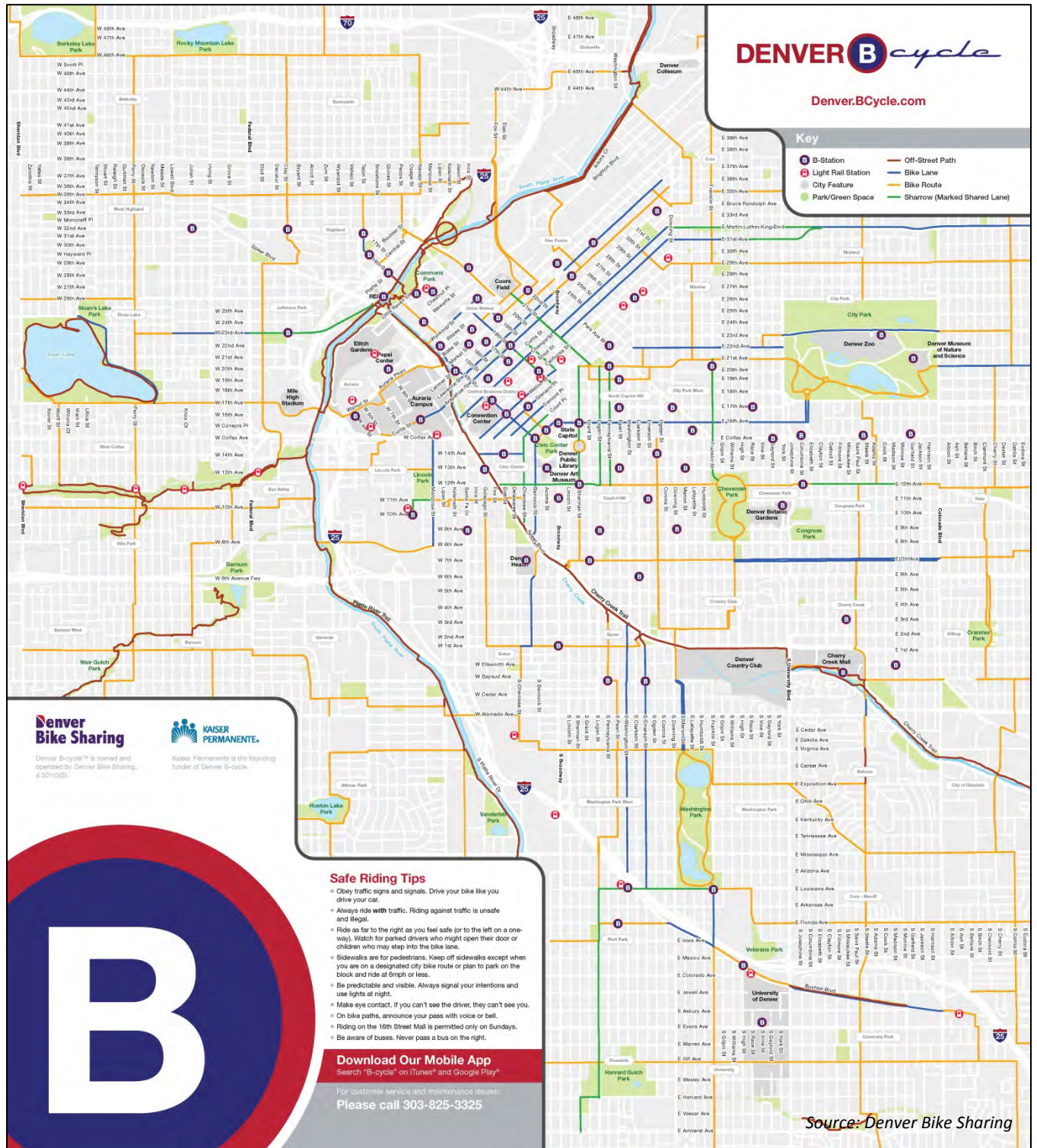


Figure 2.11: Denver Bike Share System Map



Figure 2.12: Aspen Bike Share System Map.

### 2.3.4 Madison B-Cycle

Madison B-Cycle was launched in 2011 and is a partnership between Trek Bicycle (headquartered in Madison) and the City of Madison. Trek donated the bike share system and entered into a five year commitment to operate the system. Operational costs are funded by user revenues, advertising, and sponsorship. Trek covers any operational deficiency. Although this funding model is not typical, the system provides an example of an operating system in a similar sized community to Fort Collins that features a major university campus, similar land use patterns, and a primarily bus-based transit system. An additional set of five stations are planned for deployment in 2014.

The program partners with the University of Wisconsin (UW) - Madison to offer reduced price memberships to students, staff, and faculty (i.e., \$20 per year rather than \$65). Approximately 80 percent of annual members are linked to this program and the stations on the UW campus are the busiest in the system. A survey of annual members conducted at the end of the 2012 season showed that, although 23 percent of bike share trips

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replaced a bus trip, 93 percent of annual members considered bike share as an enhancement to the public transportation system. Approximately 17 percent of bike share trips replaced a vehicle trip.<sup>34</sup>

### 2.3.5 Capital Community Bike Share, Lansing, MI

Capital Community Bike Share (CCBS) is a pilot smart bike system with four “stations” along Michigan Avenue in Lansing, Michigan. Stations consist of specially designed bike racks fitted with a specially designed locking mechanism. A solar panel, GPS unit, touchscreen and credit card reader are provided on the bicycles. The program is a partnership of the City of Lansing, Ingham County Land Bank, and the Tri-County Bicycle Association with station support coming from the Lansing Board of Water and Light.<sup>35</sup>



Figure 2.13: Smart Bike Technology Used in Lansing, Michigan.

<sup>34</sup> Madison B-Cycle 2013 Annual Report. Accessed on February 17, 2014 at <https://madison.bcycle.com/LinkClick.aspx?fileticket=cxx1EMwRz1Q%3D&tabid=461>

<sup>35</sup> MLive (October 2013), *Lansing Bike Share Program is Up and Rolling*. Accessed on February 17, 2014 at [http://www.mlive.com/lansing-news/index.ssf/2013/10/lansing\\_bike\\_share\\_program\\_is.html](http://www.mlive.com/lansing-news/index.ssf/2013/10/lansing_bike_share_program_is.html).

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The program is unique as it did not launch utilizing large private funding or timely federal funds. The program was launched with an initial budget of \$40,000 raised from donations, grants, and initial membership. CCBS partnered with A2B Bike Share (an Ann Arbor startup) to develop and provide the smart bike technology (approximate cost of \$2,000 per bicycle). The goal is to sustain the program through user fees, memberships, contributions from the private sector and federal grants.<sup>36</sup>

CCBS is a registered non-profit that owns the equipment and manages the program including the contract between CCBS and A2B, which specifies that “the city will be in charge of installation, repair and maintenance” and A2B responsible for monitoring the system and “taking care of all of the administration.”<sup>37</sup>

### 2.3.6 Chattanooga Bike Transit System

The City of Chattanooga started to explore bike share as early as 2007, however program development commenced with the award of \$100,000 in funding from the local Lyndhurst Foundation in 2009. The City, partnering with the Chattanooga Area Regional Transportation Authority (CARTA), was awarded a federal CMAQ grant the following year to start the system.<sup>38</sup> The system cost approximately \$528,000 to operate for the first 12 months.<sup>39</sup>

The system currently features 300 bicycles at 30 stations as shown on **Figure 2.14**. The City of Chattanooga owns the system which is administered by Outdoor Chattanooga (OC), a division of the City’s Parks and Recreation Department. OC contracts operations to a private operator with an agreement to share any system profits (75% City/25% private operator).

The system has faced a number of challenges, including delays in disbursing federal grant money due to Buy America requirements, technology challenges as the vendor updated its operating system, difficulty attracting major sponsors, and a generally auto-oriented culture in the city.

The University of Tennessee Chattanooga plays a large role in the system with five stations (80 docks) located in and around the campus, as well as providing subsidized memberships to students which make up a large number of members. The program has also partnered with the University to conduct bicycle and pedestrian related research and analysis.<sup>28</sup>

The connection with transit is emphasized through the program’s name as a “bicycle transit system” and stations located at major transit stations and stops. CARTA was also a major partner in securing federal funding.

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<sup>36</sup> Bridge Michigan (January 8, 2014). *Bike-share Programs Rolling Out Across Michigan*. Accessed on February 17, 2014 at <http://bridgemi.com/2014/01/bike-share-programs-rolling-out-across-michigan/>

<sup>37</sup> City Pulse (June 19, 2013). *Sharing Bikes*. Accessed on February 17, 2014 at <http://npaper-wehaa.com/citypulse/2013/06/19/#?article=1933609&page=25>

<sup>38</sup> Streetsblog (February 2013). *Chattanooga Bike-Share: Lessons for Smaller Cities*. Accessed on December 5, 2013 at <http://dc.streetsblog.org/2013/02/11/chattanooga-bike-share-lessons-for-smaller-cities/>

<sup>39</sup> Chattanooga Bicycle Transit System (2013). *Bike Chattanooga – First Year of Operations*.

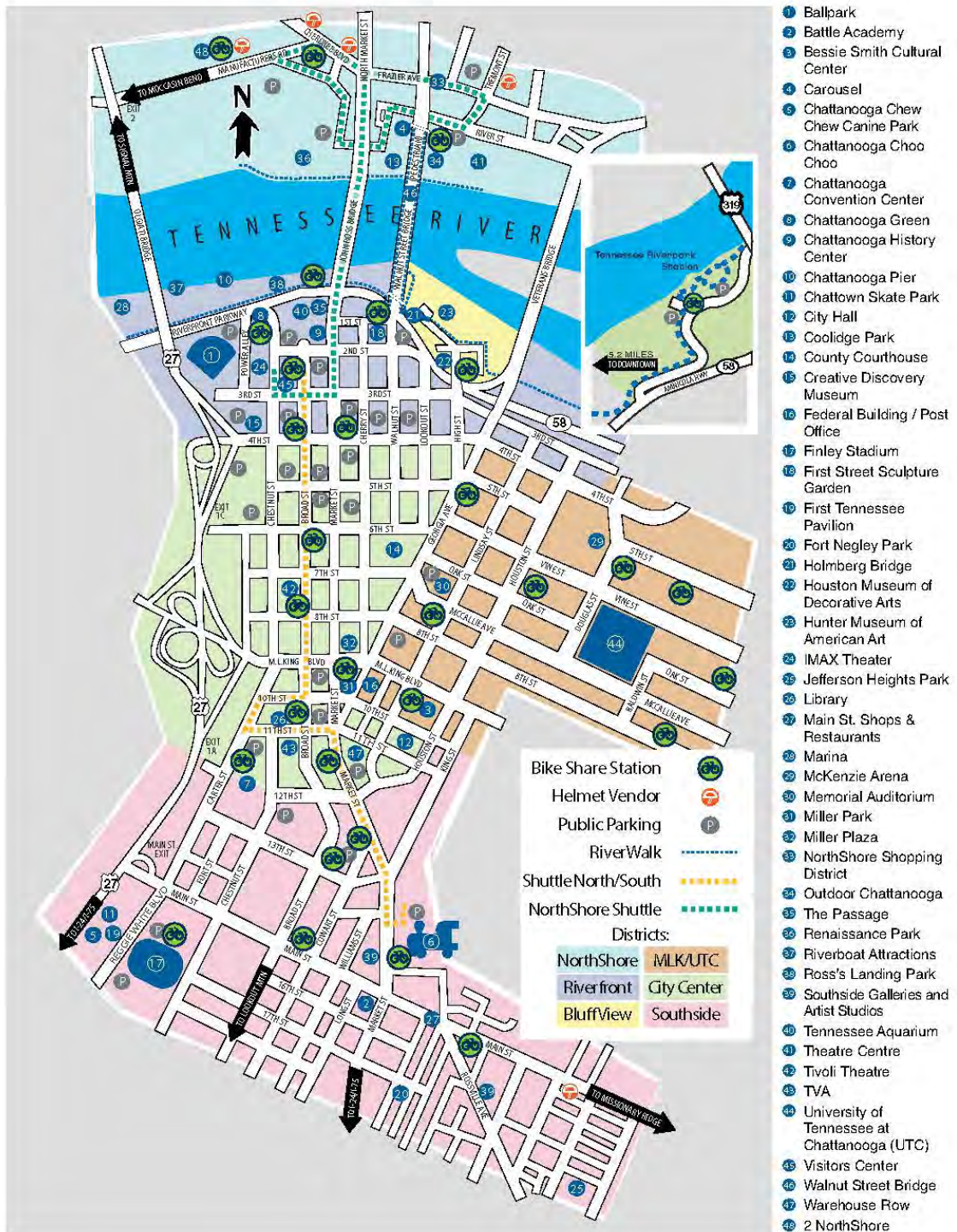


Figure 2.14: Chattanooga Bike Transit System Map.<sup>40</sup>

<sup>40</sup> The Pulse, April 26, 2012. *Pedaling into the Future*. Accessed online at <http://www.chattanoogapulse.com/beginnings/pedaling-into-the-future/> on May 9, 2014.

## 2.4 Summary of Business Case for Bike Share in Fort Collins

Bike share provides a multitude of mobility, transportation, economic, health, environmental and safety benefits, as previously noted. Some of the major benefits that bike share could bring to Fort Collins include:

- Providing an additional transportation option that by itself or combined with other options presents an opportunity to reduce dependence on automobile transportation.
- Expanding and enhancing existing and future transit services by providing a first-and last-mile option.
- Introducing new riders to the benefits of bicycling and spurring new impetus for further investment in bicycling facilities.
- Building on the City's reputation as a forward-thinking, bicycle-friendly community and using bike share to promote the city to potential employers, residents, and visitors.
- Providing an economic uplift to local businesses.
- Reducing household transportation expenditure.
- Improving physical and mental health and reduce health care costs.
- Reducing greenhouse gas emissions and increase environmental consciousness.
- Introducing more riders on safely designed and well maintained bicycles to positively contribute to the safety in numbers effect.
- Introducing new opportunities to promote safety messaging to all road users.

Case studies of other mid-sized cities with similar characteristics to Fort Collins show that there is no single correct way to form, implement, or operate a bike share system. Cities build on the momentum created by those championing the idea, but all successful systems need political and staff support from city government as well as in assisting with capital fundraising. Cities can stay involved in the implementation and management of the program, although another common model is to involve a non-profit organization in the management of the system to take advantage of the diversity of funding sources.

Membership and user fees are expected to cover only a portion of the operating cost (35% to 40% in existing systems) with the remainder needing to be supplemented by other sources.

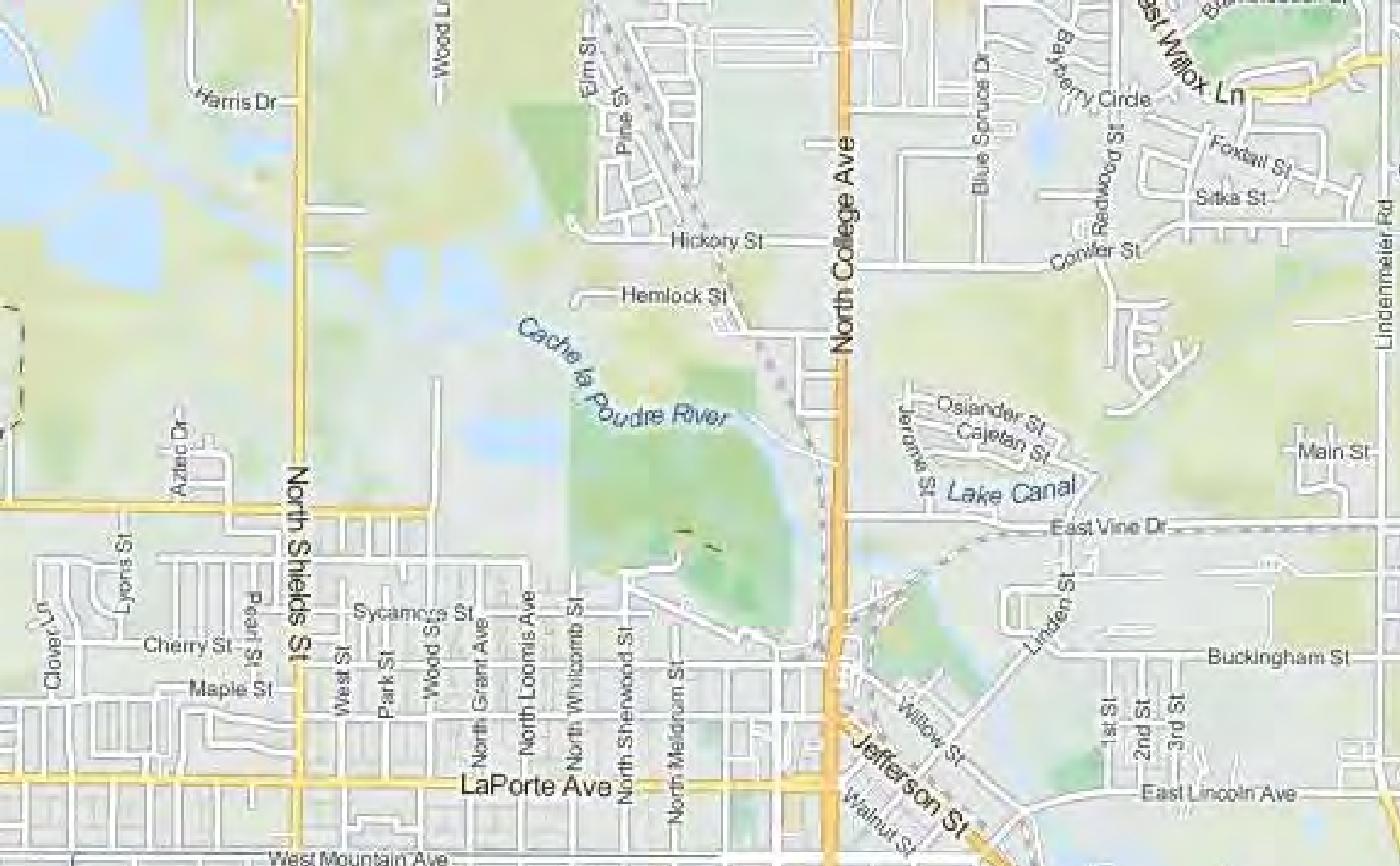
While the benefits of bike share have been clearly documented, there are also risks associated with launching and operating a bike share program. The major risks to bike share in Fort Collins include:

- The possibility that some bike share trips may detract from other public transit or active transportation trips or from the Bike Library.<sup>41</sup>
- The need to ensure that sufficient funding is available to support capital, expansion, and ongoing operations. Most bike share systems are not economically self-sustaining from membership and usage fees alone.
- Concerns by local bicycle rental businesses that bike share may threaten the local share of their market.
- Defining the role of the Bike Library and the bike share system so that they serve different users.
- Ensuring that rebalancing efforts do not offset the greenhouse gas emission benefits of the system.

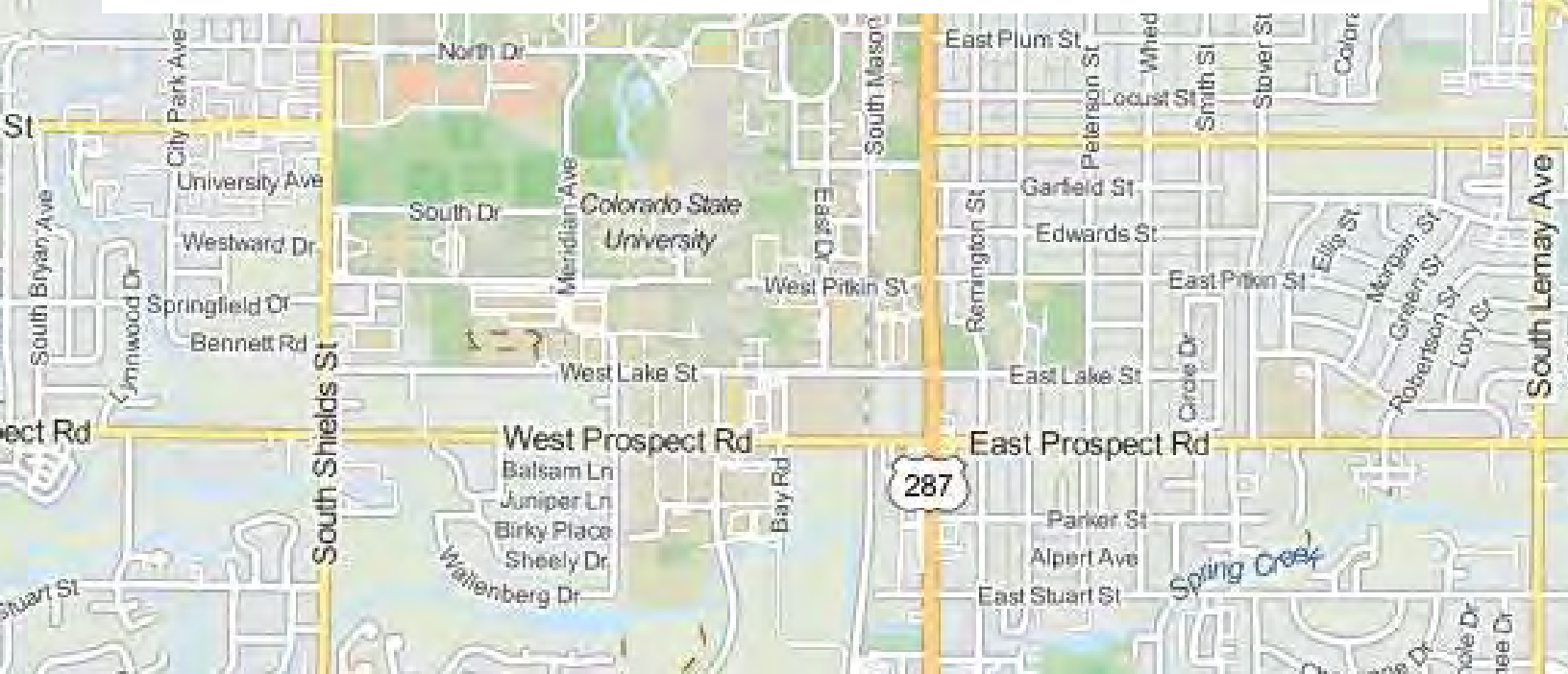
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<sup>41</sup> The market share and typical users of the Bike Library are discussed in Section 3.2.





# Demand Analysis and System Planning



### 3 Demand Analysis and System Planning

This section of the Business Plan includes a detailed demand analysis to identify where and how many people are expected to use the system as well as a planning exercise that includes GIS mapping, public outreach, and stakeholder engagement to determine how big the system should be and how it should be phased. It starts by putting these considerations into context using a goal setting exercise to understand the highest priorities for the program and to use these to define success for the system.

A market analysis was undertaken to understand where bike share would fit among existing transportation options in Fort Collins and in particular, the differences between private bicycling, automated bike share, and the Bike Library. Typical bike share trips and users in other cities were used to understand what trips in Fort Collins would be made by bike share compared to the Bike Library.

To answer how large the system should be and where it should be implemented, the project team undertook several analysis tasks including:

- A community analysis was prepared using available GIS information to understand the spatial distribution of various populations, trip generators, and trip attractors. The resulting heat maps identify areas of the community with the highest potential demand for bike share and were used as a first attempt at identifying a potential service area and phasing plan for the system.
- Public outreach was conducted in concert with the 2014 Bicycle Master Plan which included a public open house, a project website, and an online crowd-sourcing map that allowed people to suggest possible station locations.
- Stakeholder outreach was conducted with the representatives of the TAC and other interest groups including private and public sector individuals and organizations representing transportation, public health, economic development, tourism, and community interests. Stakeholders were asked how they thought a bike share program could benefit the community, any challenges they saw for implementation, and how their organization could best be involved.

This section answers the questions:

- What is considered success?
- Who will use the system?
- Where should it be implemented?

A list of challenges and opportunities accompanies each sub-section. These are summarized at the end of the section and used in later parts of the Business Plan.

#### 3.1 Program Priorities

Priorities for the bike share program in Fort Collins were developed in consultation with the TAC using the goals established as part of the 2013 EPA study as a starting point. TAC members were asked to identify their top three priorities from the list and the results were used to rank system priorities, which are presented in **Table 3.1**.

**Table 3.1: Priorities for the Bike Share System in Fort Collins**

Goals (in ranked order)
To complement and serve as an extension of transit (in particular, the opportunity for bike share to provide east-west transit connections to and from MAX).
To grow bicycling as a key component of the transportation system, providing people with more transportation options.
To provide accessibility (to destinations) to all socioeconomic groups.
To attract new users to bicycling by making biking fun and reducing barriers to participation (e.g., providing easy-to-use step through bikes, users do not have to maintain the bikes, etc.).
To make bikes available 24/7 and use an affordable operational cost model.
To complement and build on the success of the Fort Collins Bike Library, serving different users/trips and providing increased geographic coverage, and ensuring that bike share remains a source of pride.
To support economic development (e.g., Old Town and mid-town redevelopment, Harmony corridor).
To draw tourists to Fort Collins, including through incentives such as bike share reciprocity programs.
To support non-residents in their commute to the city, making transit, carpooling and vanpooling more viable.
To increase integration with CSU, making it easier for the community to visit campus and vice versa.

The results of this process identify several clear priorities for the bike share system including:<sup>42</sup>

- Making use of bike share’s synergies with transit to **complement and extend existing and future transit services**.
- Using bike share as a means to **introduce new riders to bicycling** and to grow bicycling as an **important and relevant part of the city’s transportation system**.
- Maximizing the availability of the system and in particular making the system **accessible and affordable** to all socio-economic groups.

These priorities are used to guide other parts of the business plan including the choice of business model, the funding and financial plan, and the development of an implementation plan.

*Challenges:*

- Providing an affordable system may increase pressure on non-user funding sources such as sponsorship to provide financial support for the system.
- Providing stations in low-demand areas can be challenging in terms of creating a sustainable funding model.

<sup>42</sup> Note: in some instances the priorities below combine multiple goals.

*Opportunities:*

- There is support for bike share to integrate with transit. This provides an opportunity to maximize station locations at MAX and major transit stops, encourage support from Transfort, and may assist in securing transit-based funding sources (such as FTA grants).
- Bike share could be used to increase the number of cyclists in Fort Collins and promote the development of new or improved bicycle infrastructure on key corridors.

### 3.2 Market Analysis

It is important to understand where bike share fits into the existing transportation spectrum in Fort Collins and in particular, to determine whether bike share will serve a different market to private bicycling and the existing Bike Library. This section addresses who might use an automated bike share system based on experience in other cities and whether this complements or competes with the Bike Library.

**Figure 3.1** shows the relationship between trip distance and trip cost for existing transportation options in Fort Collins. Bike share could fill the gap between trips too far to walk and those too short to wait for transit or to incur the expense of driving.

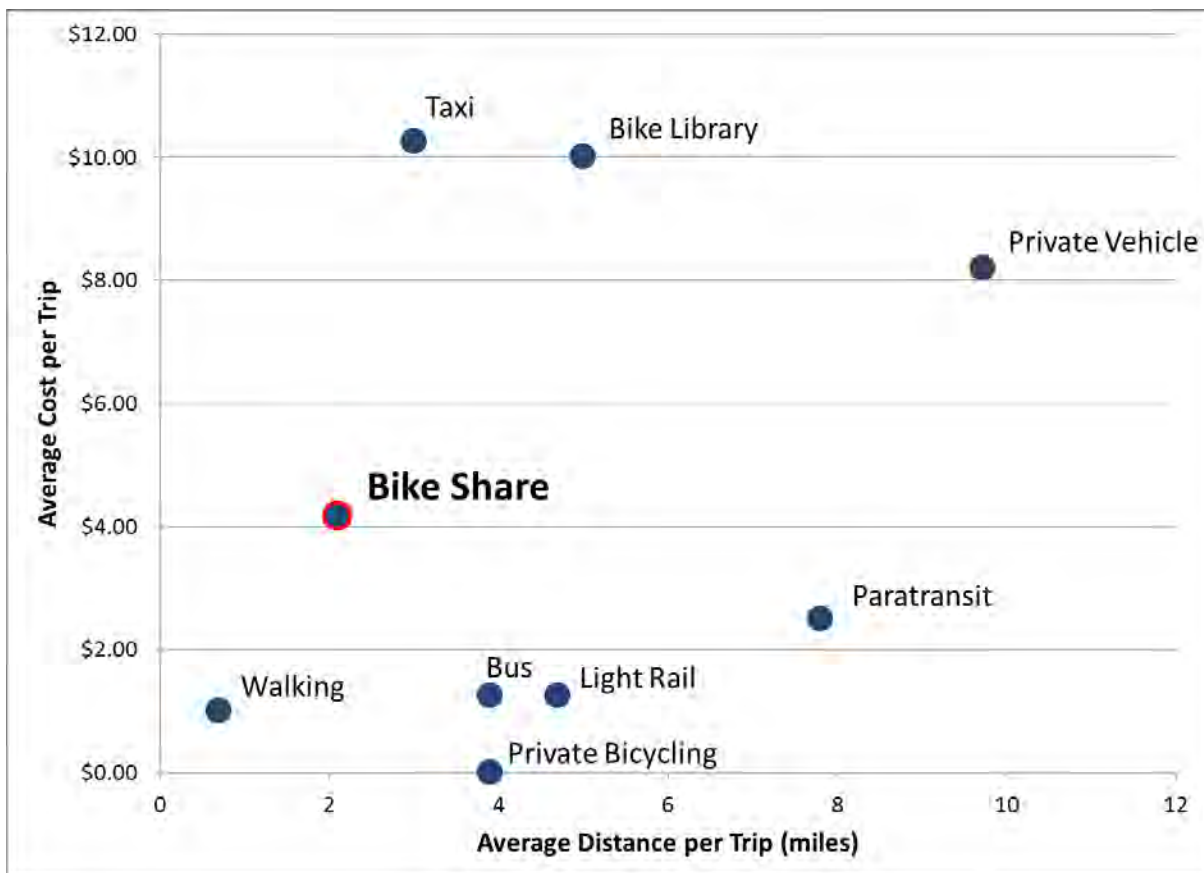


Figure 3.1: Urban Transportation Spectrum (Around Town)<sup>43,44,45,46,47</sup>

<sup>43</sup> FHWA. 2009 National Household Travel Survey - Summary of Travel Trends. <http://nhts.ornl.gov/2009/pub/stt.pdf>

One of the key questions to address is how an automated bike share system differs from the existing Bike Library or from private bicycling. An analysis was prepared that considered the characteristics of these different modes. The results are summarized in **Table 3.2**.

**Table 3.2: Comparison of Bicycling Modes in Fort Collins**

	<b>Private Bicycling</b>	<b>Automated Bike Share</b>	<b>Bike Library</b>
<b>Impetus</b>	Planned Trip	Spontaneous or Planned Trip	Planned Trip
<b>Accessibility</b>	Broad. Depends on planning - bicycle typically stored at home	Multiple stations located throughout core area	Single primary location
<b>Cost to Enter</b>	\$100 (approximate cost of bicycle and accessories)	\$50 - \$100 (annual) \$5 - \$10 (24-hours)	\$0 - \$10
<b>Maintenance Requirement</b>	Owner responsible for regular servicing	System operator	System operator
<b>Risk of Theft</b>	High – owner responsible for locking correctly	Built in to system	Owner takes some responsibility to lock correctly
<b>Length of Trips</b>	Many trips Various lengths	Many trips Short trips (typically <2-3 miles)	Few trips Longer trips (typically >3 miles)
<b>Type of Trips</b>	Commuter Run errands Recreation	Transit connection Lunch / errands Recreation	Recreation Special events
<b>Typical User</b>	Resident (access to a bicycle)	Residents and visitors	Visitors
<b>Other Benefits</b>	Carry bike on bus Recreational or sport cycling	Link with other options Removes need to purchase bike	Guest amenity, visitor information
<b>Trips:</b>			
<b>MAX to Office</b>	✓	✓	✗
<b>Work to Meeting</b>	✓	✓	✗
<b>After Work Drinks</b>	✓	✓	✗
<b>Hotel to Restaurant</b>	✗	✓	✓
<b>Workout</b>	✓	✗	✗
<b>Explore the Trail</b>	✓	✗	✓
<b>Campus to campus</b>	✓	✓	✗
<b>Hotel to Bike Library</b>	✗	✓	✓

<sup>44</sup> 2002 National Survey of Pedestrian and Bicyclist Attitudes and Behaviors, Highlights Report

<sup>45</sup> American Public Transportation Association (APTA), Public Transportation Fact Book - 2011. p.13.

<sup>46</sup> Hampshire, R.C. and Gaites, C. An Analysis of Person-to-Person Car Sharing. TD&I Congress 2011, ASCE 2011, p.938.

<sup>47</sup> Bike rental rates based on rates from Full Cycle bike shop, taxi rates based on Yellow Cab rates, car rental rates based on average rates for a “standard” vehicle from Denver International Airport. All rates as per February 17, 2014.

Some of the potential users of a potential bike share system may include:

- Commuters looking to ride the first or last mile of their trip to connect to MAX or bus services.
- Commuters who only want to bike at the start or end of their day, and who will use another transportation mode at other times.
- Visiting friends and relatives parking Downtown and taking a bike to restaurants or to the breweries.
- Visitors staying at a midtown hotel riding downtown to the Bike Library to check out a bike for a longer period.
- Business travelers travelling from their hotel to a business meeting.
- Conference and meeting attendees going out for lunch or drinks.
- International and out-of-state students of CSU that don't bring a vehicle to campus.
- CSU families conducting campus tours or exploring campus.
- Employees that have parked in high demand locations and want to run errands through the day without losing their parking space.
- Local residents trying to get to events (e.g., at the proposed new stadium).

From discussions with Bike Fort Collins, the operator of the Bike Library, users of the Library are primarily (and increasingly) visitors. However, other users of the Bike Library include families and larger groups attracted by the variety of sizes and types of bicycles offered, as well as residents that temporarily don't have access to their own bicycle. Rentals tend to be multiple hours long and the most popular uses of the bicycles are the brewery tours and riding on the extensive trail network throughout Fort Collins.

There are several reasons why some users would use an automated system rather than the Bike Library. These include:

- The type and condition of bikes offered.
- The convenience of multiple locations and 24-hour access.
- The shorter time for check-in/check-out (compared to Bike Library).

*Opportunities:*

- The market analysis shows that there are sufficient enough differences between bike share and the Bike Library to add value in providing both services.
- Bike share may be able to provide a faster and more convenient transportation option for trips that are too far to walk but not long enough to wait for transit or pay for other modes. The primary bike share users are expected to be residents and visitors wanting to make short, spontaneous trips.

### “Typical User”

Although there is no one type of bike share or bike library user:

Washington D.C.'s **Capital Bikeshare** describes their typical annual member as someone who is “considerably younger, more likely to be male, more likely to be Caucasian, very highly educated, and slightly less affluent than the regional employee population”.

Usage data from Bike Fort Collins shows that the typical user of the **Bike Library** is a visitor to Fort Collins who is 25-45 years old.

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- The Bike Library may continue to provide a longer rental service focusing on visitors and residents looking to take primarily longer recreational rides as well as bike choices for families and those wanting specialty bicycles.

### 3.3 Community Analysis

The project team undertook a GIS-based demand mapping exercise (heat mapping) to understand where bike share is expected to be most successful in Fort Collins and conducted a review of how some of the physical, demographic, and cultural characteristics of Fort Collins might impact the potential usage of bike share. The heat mapping process included spatially analyzing several variables believed to influence bike share demand, including:

- Physical conditions, climate, and topography
- Population density and housing
- Employment density
- Colleges and student populations
- Visitors and Tourism
- Transportation, including transit, car share, and regional transportation
- Bicycling culture

The spatial analysis of each variable and the resulting heat mapping process are described below.

#### 3.3.1 Physical Conditions and Weather

Fort Collins is situated in the foothills of the Rocky Mountains and is located approximately 60 miles north of Denver. The city is generally flat and covers an area of approximately 54 square miles. The City began in what is now Old Town and grew south along College Avenue, Remington Street, and Shields Street to the University. This older part of town is generally developed with a grid-like street system that provides good connectivity for bicyclists. Since the 1950s the city has grown south along College Avenue. The newer parts of the city include curvilinear street development with cul-de-sacs and other barriers making connectivity for bicyclists more challenging.

Fort Collins exhibits the typical climate of a Rocky Mountain city with pleasant summers and cold winters often with heavy snowfall. Temperatures range from a summer average high temperature of 87° F and a winter average high temperature of 43° F.

Fort Collins is a year-round bicycle community and bike share is feasible year-round. Total precipitation is 15-16 inches per year, concentrated in the late spring and summer. Snow normally amounts to 54 inches per year but averages only 4-5 days with snow on the ground during the winter from November



Figure 3.2: Fort Collins is relatively flat despite being in the foothills of the Rocky Mountains.

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through April. Due to the climate and the flow of tourists it is anticipated that the summer months will see the heaviest use of bike share with temperatures during this time ranging from 62° to 87° F. The spring and fall seasons, with temperatures above 52° F in November and March will be quite active as well. December through February will likely see the least use of the system with average high temperatures above 42°F during this period.

*Challenges:*

- Winter months are expected to experience lower demands for bike share and bicycling in general. However given the relatively few snow days and average temperatures above 42° F, the program can likely be operated year-round.
- The mixture and density of land use outside Old Town and the traditional neighborhoods will be challenging and will need to strategically locate stations at major attractions and activity centers.
- Difficult connectivity between streets caused by curvilinear street development with cul-de-sacs can present a challenge to bicycle travel.

*Opportunities:*

- Old Town and other traditional neighborhoods offer a variety of medium to high density land uses. The street system is well-connected with a grid-like street pattern that encourages bicycling.
- Pleasant spring and summer temperatures will encourage ridership during these times.
- Generally flat topography.

### 3.3.2 Population Density and Housing

The success of bike share systems is dependent on attracting a variety of users. In addition, the areas being served need to have a critical mass of users, with higher density areas generally being more successful. **Figure 3.3** shows the distribution of population density by census block based on data from the 2012 U.S. Census. It shows that the highest population densities are located throughout the downtown core and west towards City Park, in addition to west and southwest of the CSU campus, which includes the majority of student housing stock. Densities are generally lower outside of these areas.

Experience in other U.S. bike share cities has shown that young, well educated, student, and/or wealthy populations tend to be early adopters of bike share.<sup>48,49</sup> Areas of Fort Collins meet several of these criteria.

#### **Fort Collins Snapshot**

(Based on 2010 U.S. Census)

**149,000** population (2012)

**52%** bachelor's degree or higher

**\$53,359** median household income

**2,653** persons per square mile

**33%** aged 20 – 35 years old

<sup>48</sup> Denver Bike Sharing, *2010 Annual Report*.

<sup>49</sup> LDA Consulting (2013). *2013 Capital Bikeshare Member Survey Report*. Accessed online at <http://capitalbikeshare.com/assets/pdf/CABI-2013SurveyReport.pdf> on December 13, 2013.



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Equally, providing access to the system for traditionally underserved communities such as low income and minority populations is important. **Figure 3.4** shows a map of population by income, with lower income areas shown in darker red. **Figure 3.5** shows the distribution of non-white populations. Lower income and minority populations are generally clustered in the northeast part of the City. Areas around the CSU campus are also considered low-income areas high with student populations.

*Challenges:*

- Population densities are generally low outside of the downtown and core areas and around CSU. Bike share stations will need to be more strategically located outside of these areas and focused around particular attractions or activity centers.
- Providing access to lower income and minority populations will be challenging as these populations are generally located in lower density areas that may not financially support bike share without additional funding and support.

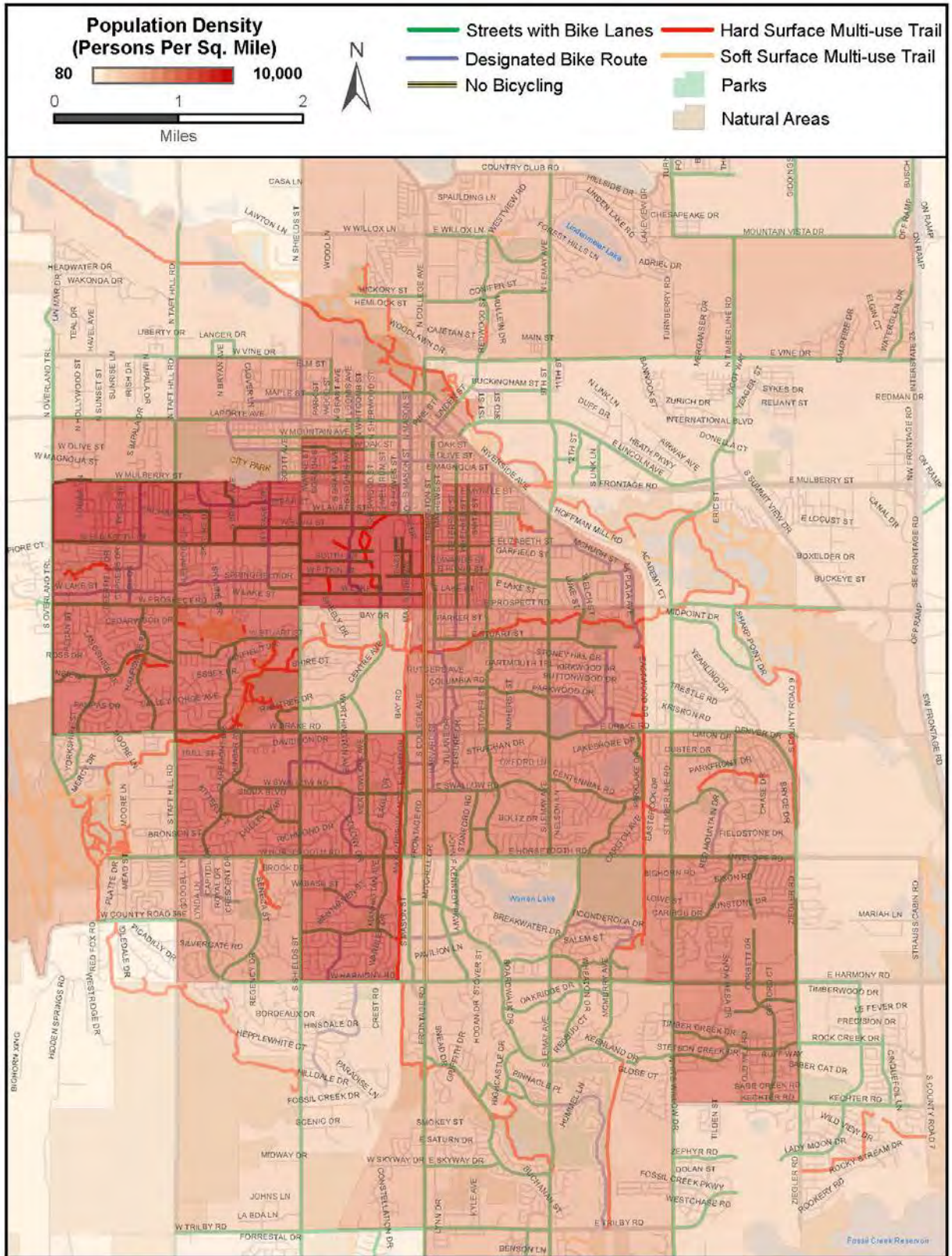
*Opportunities:*

- Relatively high population densities exist in the downtown core, west towards City Park and in close proximity to the CSU campus.
- Young, wealthy, and well-educated populations are likely to be early adopters of the program.

### **3.3.3 Employment Density**

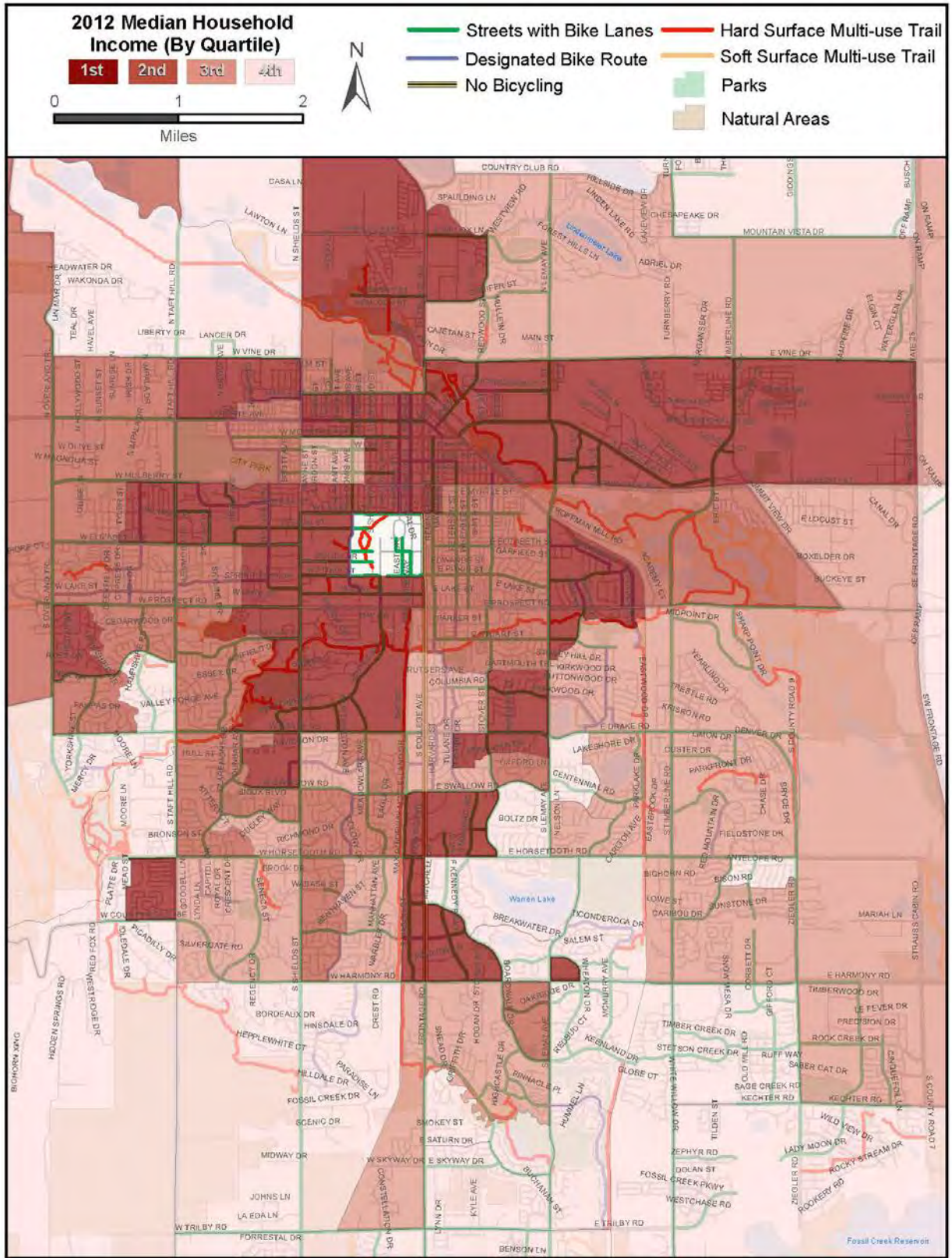
The highest employment sectors in Fort Collins are federal, state, and local government employees. High -tech industry employers (e.g., 3,000 employees at Hewlett Packard, 2,800 at Agilent, etc.) and the medical services field (e.g., 2,800 employees in the University of Colorado Health System, 800 at the McKee Medical Center, etc.) also make a large part of the employment cohort.

**Figure 3.6** shows the distribution of employment density by census block based on data from the 2012 U.S. Census. It shows that the highest employment densities are in Downtown and at the CSU campus with several other employment nodes outside of downtown at some of the larger business campuses such as Otterbox, Woodward, the Poudre Valley Hospital, the Foothills Mall at College Avenue and Horsetooth Road, the business park at Prospect Road and Timberline Road, and the Hewlett Packard campus on Harmony Road.



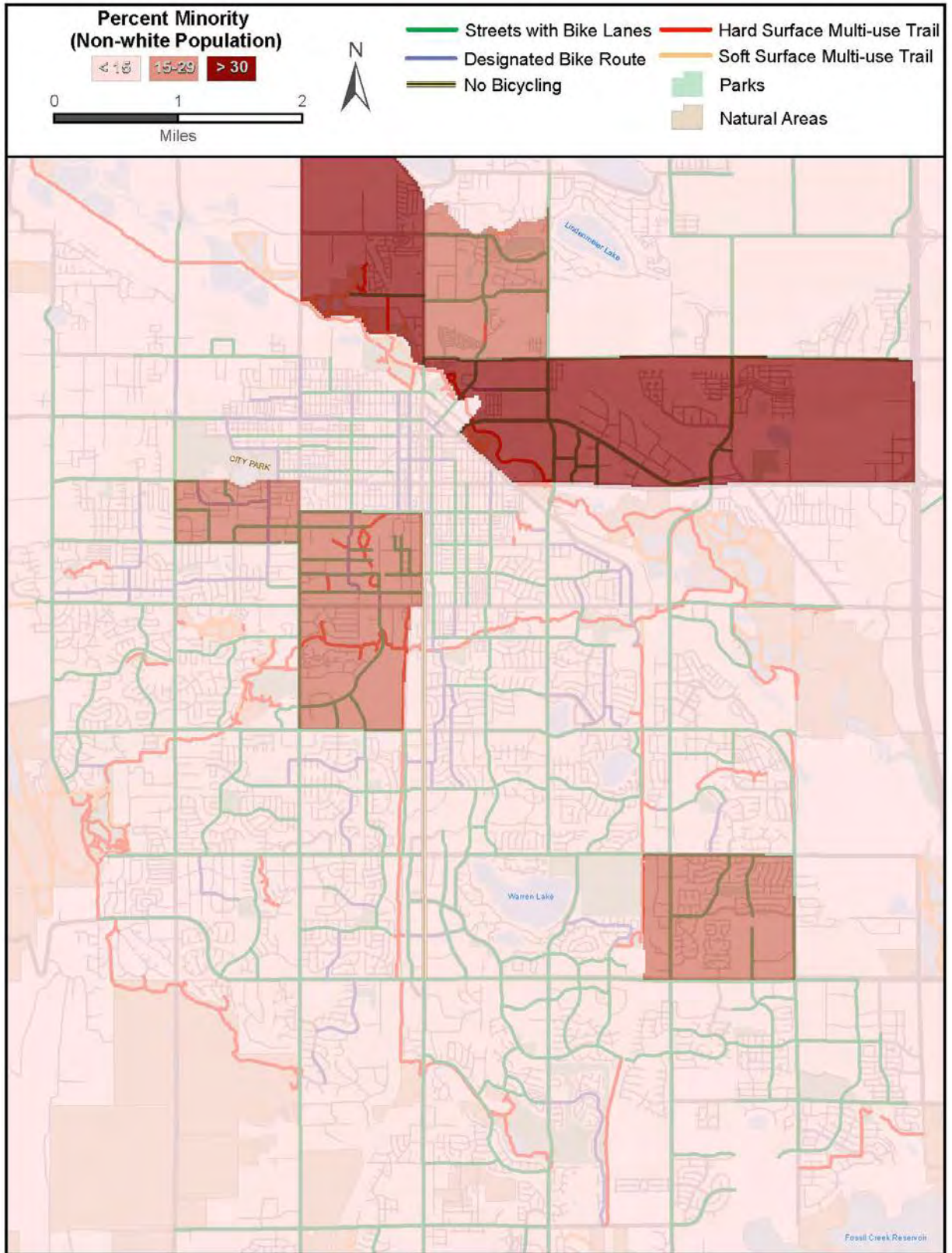
Source: US Census Bureau, 2012 American Community Survey

Figure 3.3: Population Density in Fort Collins.



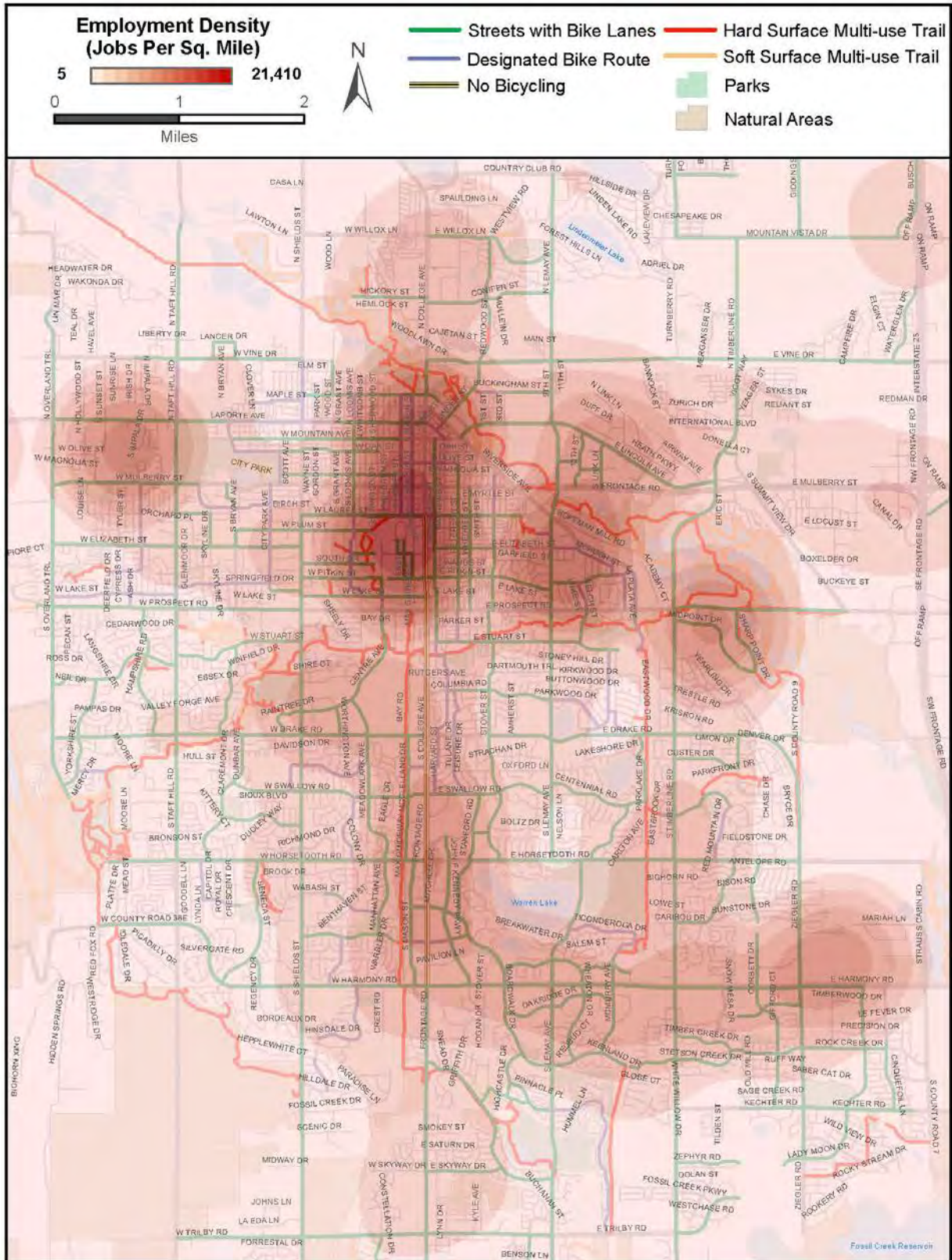
Source: US Census Bureau, 2012 American Community Survey

Figure 3.4: Income Distribution in Fort Collins.



Source: US Census Bureau, 2012 American Community Survey

Figure 3.5: Percentage of Non-White Population in Fort Collins.



Source: US Census Bureau, 2012 Longitudinal Employer-Household Dynamics Survey.

Figure 3.6: Employment Density in Fort Collins.

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*Challenges:*

- Some of the larger employment nodes, such as the Hewlett-Packard campus are isolated or some distance from other attractions and land uses. These locations may be difficult to serve or may need to be part of a future phase.

*Opportunities:*

- Downtown and the CSU campus both have high densities of employment.
- There are several employment nodes and local attractions that may serve successful bike share stations.

### **3.3.4 Colleges and Student Populations**

Fort Collins is home to Colorado State University (CSU) which plays a large role in the size of the community with 27,000 students and 7,000 faculty, staff, and employees and plans to grow to 35,000 students in the near future. The main campus is located approximately 1.5 miles southwest of Downtown on the west side of College Avenue and the new MAX line between W Laurel Street and W Prospect Road. The School of Veterinary Medicine and Veterinary Teaching Hospital is located on a separate campus two miles south at W Drake Avenue. The Foothills Campus is located four miles west of the main campus off of LaPorte Avenue. In addition, the Front Range Community College (FRCC) hosts up to 18,000 students annually with most being local residents that study full- or part-time. The FRCC campus is located approximately five miles south of Downtown and one mile west of the MAX line.

College students tend also to be early adopters of the program and it is expected that a significant percentage of early users would come from the student, staff, and faculty of CSU. Bike share could be used to increase connectivity between the main and secondary campuses, link student housing to various locations within the university, and to provide an easy connection to MAX and Downtown Fort Collins.

*Challenges:*

- There are some restrictions to riding bicycles within the CSU campus that will need to be considered in placing stations.

*Opportunities:*

- CSU is expected to be a big supporter of a future bike share system. Students, staff and faculty are expected to be early adopters of the program. The program could be used for short trips within the main campus, between campuses, or to connect students, faculty, and staff to MAX, student housing and other parts of the city.
- Bike share could serve a connection between MAX and the Front Range Community College campus along Harmony Road.
- Because CSU is currently developing a Bicycle Master Plan, bike share could be integrated into network, policy, and programmatic recommendations.

### 3.3.5 Visitors and Tourism

Over 1 million people visit Fort Collins each year. For bike share, visitors are typically the most profitable user group of the system. They tend to purchase 24-hour or 3-day passes, take fewer trips, and have tended to be more willing to exceed the “free ride period” and incur additional trip fees. In other cities, casual trips make up anywhere between 40 and 60 percent of all bike share trips.

The major visitor attractions in Fort Collins are located in Old Town with its mix of shops and restaurants. Fort Collins is also recognized for its breweries and other attractions that tend to be located in lower density neighborhoods.

Visitor accommodations vary from small bed & breakfasts to large-scale hotel chains. The majority of major hotels are located in Old Town, Midtown, or near the highway interchanges. Old Town and Midtown hotels may be good locations to coordinate with bike share stations so as to provide visitors with a quick and easy way to move around town without needing a vehicle. A map of major hotels and visitor attractions is included on **Figure 3.8**.

#### *Challenges:*

- Fort Collins attracts a relatively small number of tourists compared to other U.S. cities with existing bike share programs. This may result in fewer casual members and lower user revenues.



**Figure 3.7: Shopping District in Old Town.**

#### *Opportunities:*

- Bike share could provide a means for hotel guests to move about the City without the use of an automobile.
- Bike share could provide a unique means of conducting Fort Collins’ well known brewery tours.

### 3.3.6 Transportation

Fort Collins offers a diverse transportation network that includes miles of dedicated bikeways, bus services operated by Transfort, private automobile, and car share on the CSU campus. Transit in Fort Collins includes an extensive bus system shown on **Figure 3.9**. In addition, the City’s first bus rapid transit (BRT) line, MAX, will open in May 2014. MAX will run north-south along the Mason Corridor with buses at 10 minute frequencies between 5 a.m. and midnight from Monday to Saturday. MAX station locations are shown on **Figure 3.10** and will connect employment and activity centers, existing bus services, the City’s trail system, and park-and-ride lots in Midtown, the CSU campus and Downtown. Bike share provides an opportunity to extend the reach of the MAX service and in particular provide a first- and last-mile transit option east-west to and from the MAX stations. Bike share could provide an opportunity to:

- Supplement existing transit services and provide a link to and from the new MAX stations

- Be used along with other modes to reduce dependency on automobile travel
- Provide people using transit and carpooling another means to move about during the day

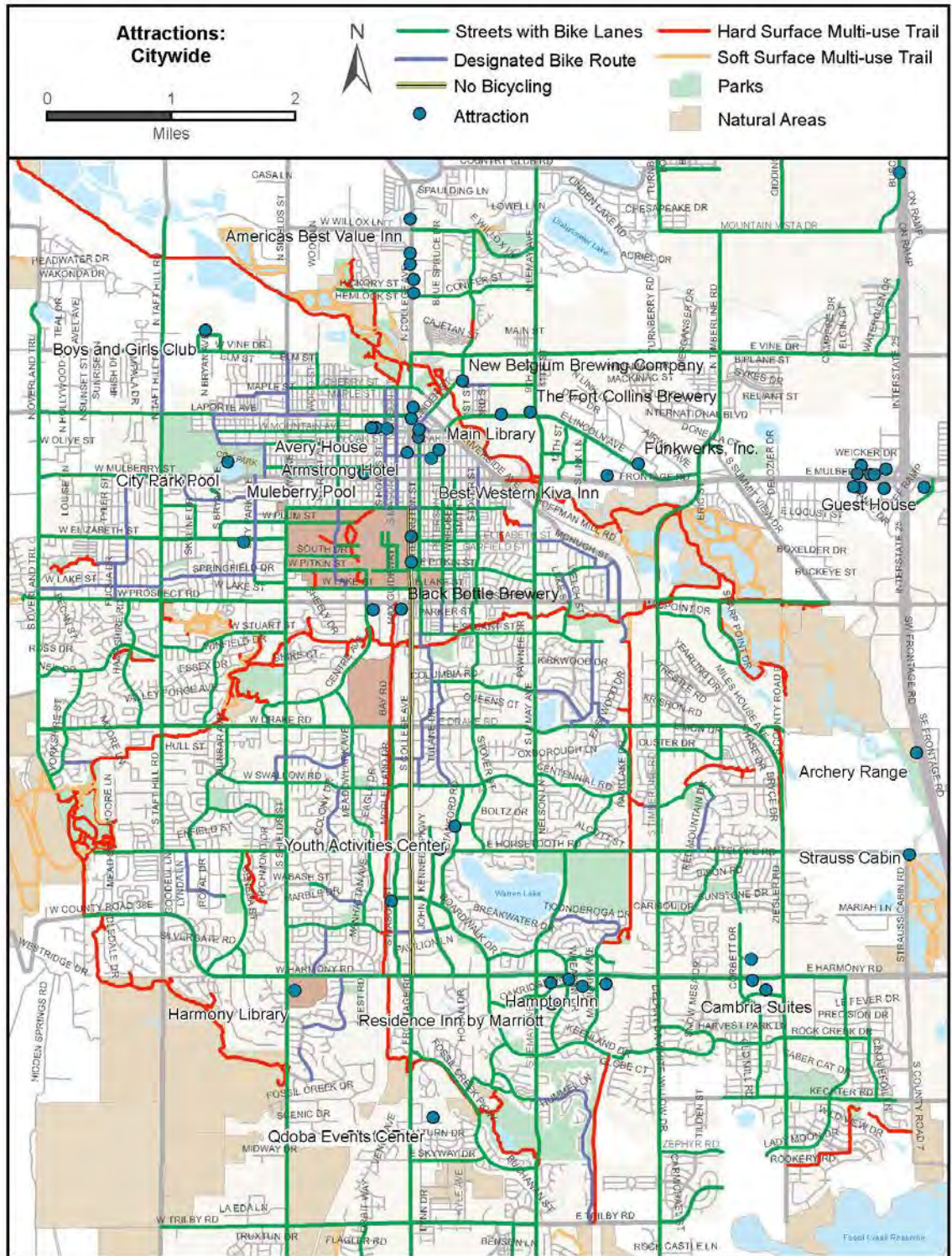


Figure 3.8: Hotels and Attractions in Fort Collins.



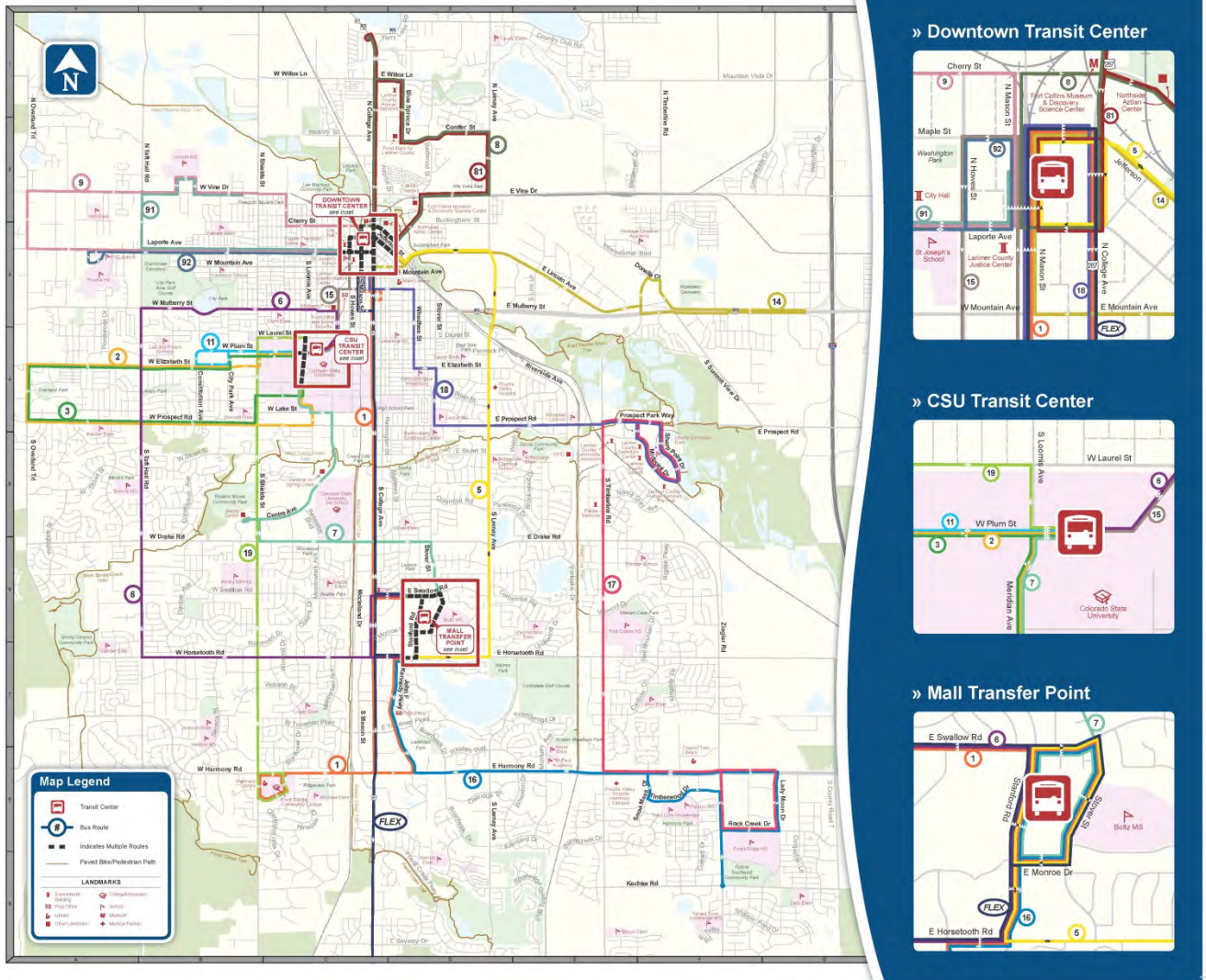


Figure 3.9: Existing Transfort Bus Service Map.

Boarding and alighting data by transit stop is not currently available for the bus system in Fort Collins. To understand the areas of highest transit use in the City, the project team mapped “bus stop density”, a measure of how many routes serve each bus stop. The results are shown on **Figure 3.11** and as expected, the highest density of routes is in Downtown and along east-west routes leading into Downtown. The project team also mapped expected MAX ridership (based on forecast provided by Transfort). This is shown on **Figure 3.12** with ridership expected to be highest in Downtown and near the CSU campus.

Bicycling is a popular and effective way to get around town. In 2012, 7.9 percent of workers 16 years and older commuted to work by bicycle.<sup>50</sup> Fort Collins was recognized by the League of American Bicyclists as a Platinum Level Bicycle Friendly Community in 2013 and features approximately 170 miles of bike lanes and nearly 35 miles of shared multi-use paths. A map of bike facilities in Fort Collins is included on **Figure 3.13**.

<sup>50</sup> 2012 American Community Survey.

As explained above, the City is also home to the Fort Collins Bike Library, which is currently located in Old Town and provides residents and visitors a free service to check out bicycles for up to three days. The Bike Library has checked out almost 20,000 bicycles to over 15,000 riders since opening in 2008.

*Challenges:*

- Single occupant vehicle travel is still a high portion of trip-making in the region. Parking is generally low cost or free and provides little disincentive to driving.
- There is a lack of east-west protected bikeways, as well as a number of high-speed "barrier" roads (e.g., Harmony) and railroad lines that could impact access to some destinations.

*Opportunities:*

- Bike share provides an additional mobility option that can be coupled with other transportation options to reduce reliance on automobile travel.
- Bike share offers a first- and last-mile connection to and from transit and in particular should be provided as an option at MAX stations and major transit connection points.
- Linked with regional travel options and car share services, bike share completes a realistic set of transportation options that will allow residents and visitors to move around the city without the need for a private automobile.
- Fort Collins has a strong bicycling culture and an extensive bikeway system that can be used to provide bike share users with a comfortable and safe way to move between stations.

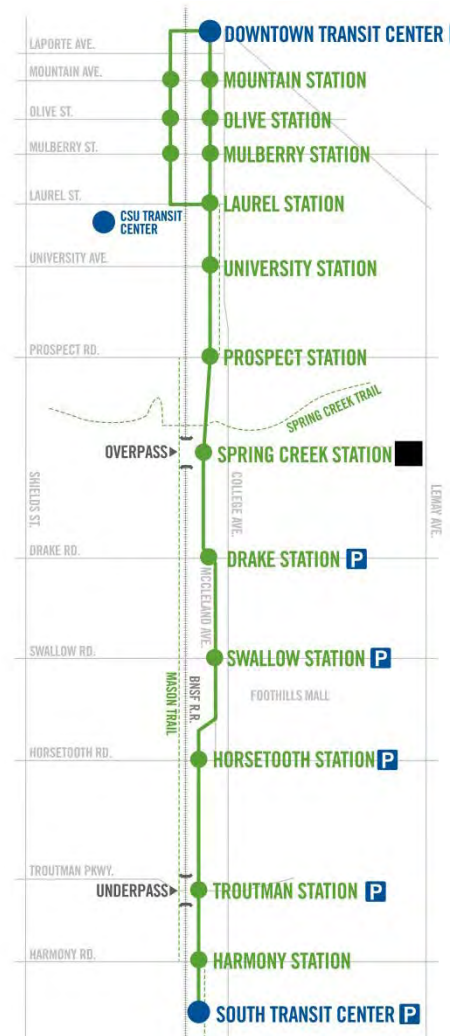
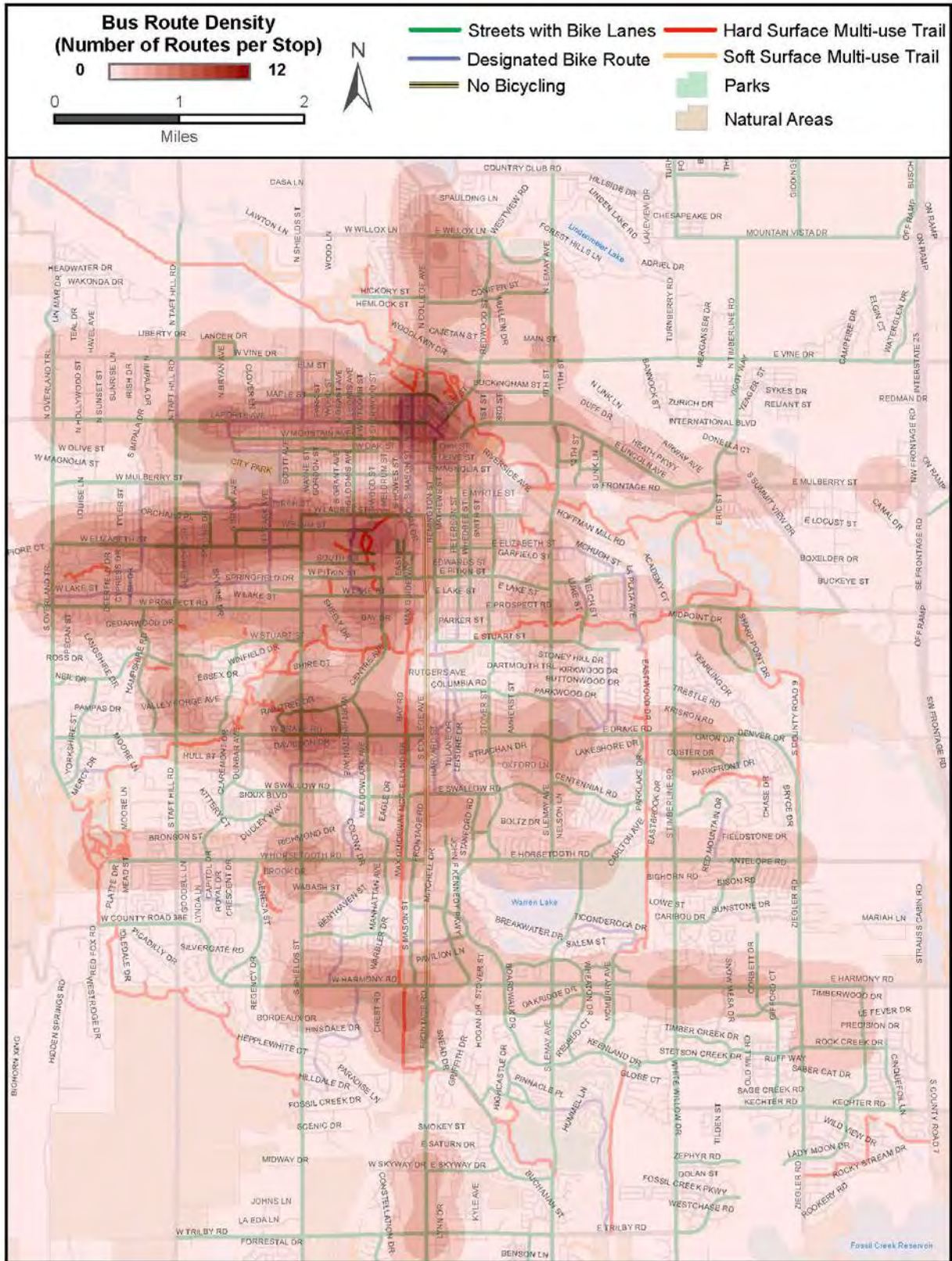


Figure 3.10: Proposed MAX Route.



Source: Transfort, 2014

Figure 3.11: Existing Bus Route Density in Fort Collins.

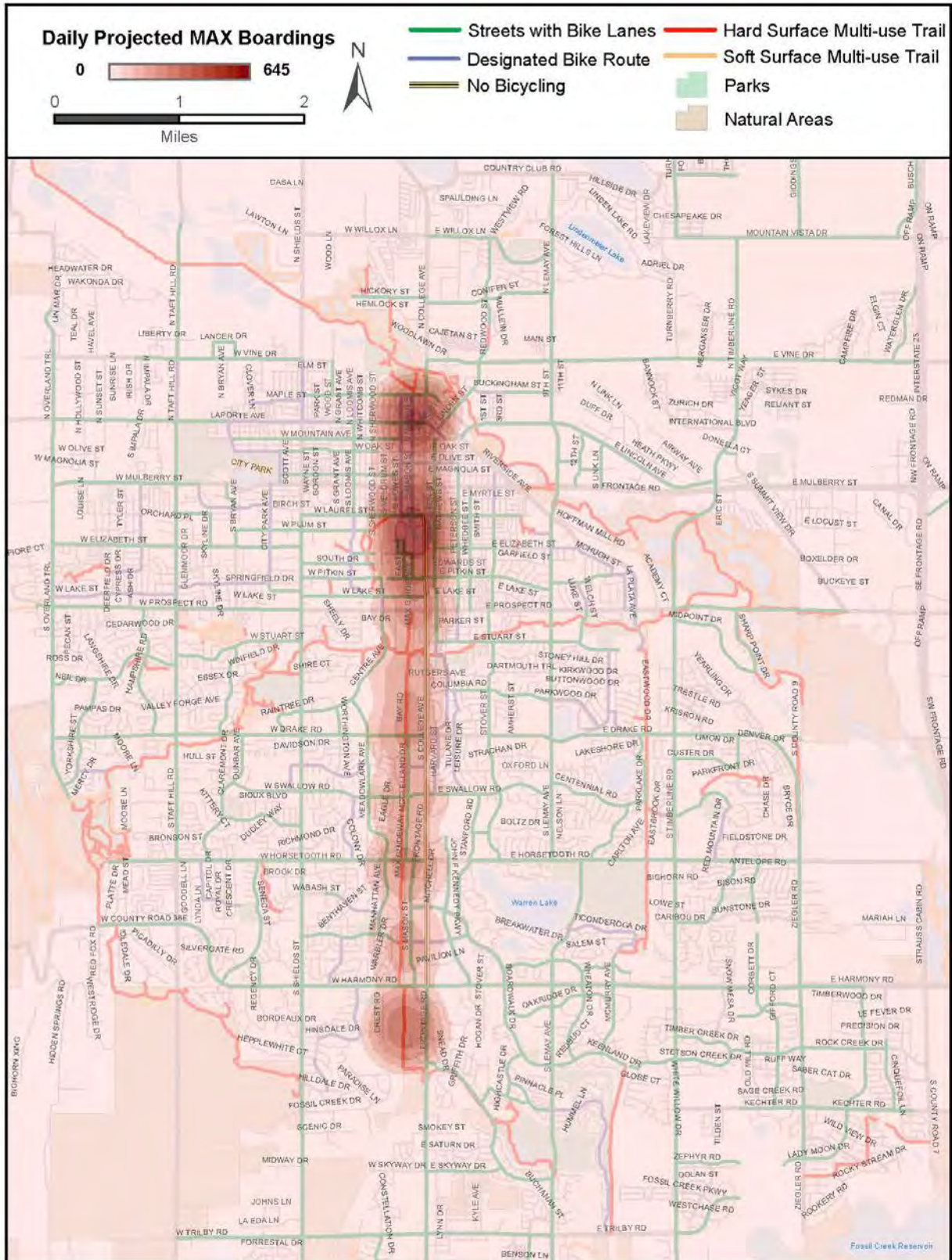


Figure 3.12: Forecast MAX Ridership.

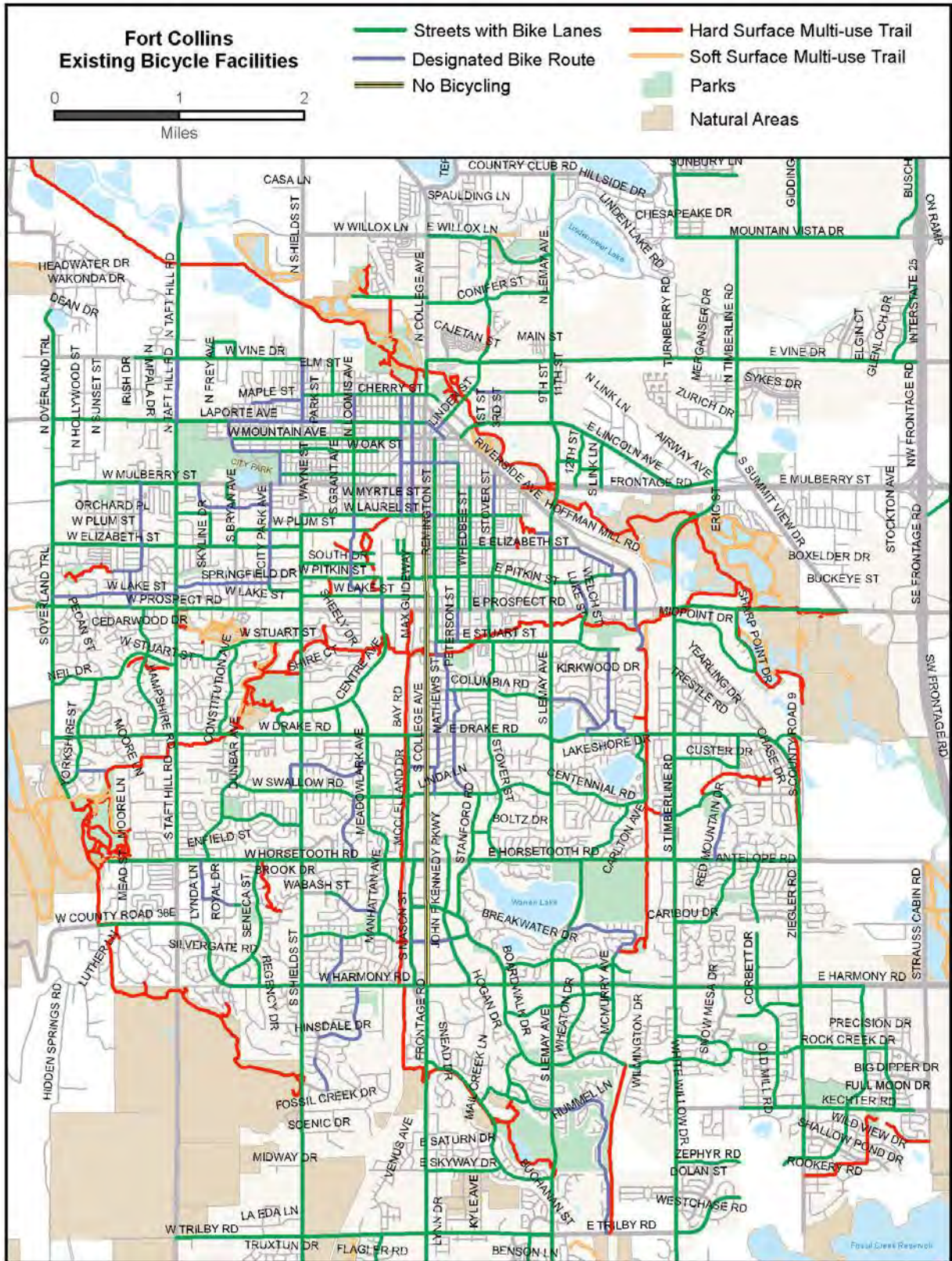


Figure 3.13: Existing Bikeways in Fort Collins.

### 3.3.7 Demand Analysis / Heat Mapping

A demand (or “heat mapping”) analysis was performed using GIS data provided by the City and from publicly available sources. Bike share tends to work best where there are a variety and density of land uses and activities, and as such the bike share demand map was created by aggregating various population, employment, housing, attraction and proximity data. This included:

- Population density
- Employment density
- Community and tourist attractions (e.g. libraries, community centers, hotels, breweries, etc.)
- College enrollment
- Transit ridership and stops
- Equity and socio-economic accessibility: measured using median household income and non-white population data
- Topography

The heat mapping methodology includes a point-scoring system where points are allocated for an area based on its performance in each of the above categories. These are then summed to give a total “suitability” score. The weighting and methodology used for each variable is described in **Table 3.3**.

**Table 3.3: Heat Mapping Scoring and Methodology**

Variable	Max Points	Methodology
Population Density	20	Census blocks grouped into quartiles based on their population density. Census blocks assigned scores based on which quartile they fall, e.g. top quartile = 20 points, bottom quartile = 5 points.
Employment Density	20	Census blocks grouped into quartiles based on their employment density. Census blocks assigned scores based on which quartile they fall, e.g. top quartile = 20/ points, bottom quartile = 5 points.
College Enrollment	7	College campuses assigned scores based on enrollment, e.g. CSU = 27,000 student enrollment = 7 points, FRCC = 18,000 student enrollment = 4 points, etc. Points assigned to the entire campus area.
Community and Tourist Attractions	15	Point locations based on information from the City and publically available maps. These locations include: <ul style="list-style-type: none"> <li>• Breweries (15 points)</li> <li>• Community centers and libraries (15 points)</li> <li>• Tourist attractions (10 points)</li> <li>• Major hotels (10 points)</li> <li>• Restaurants (5 points)</li> </ul> Scores graduated from the maximum score within a ¼ mile radius from the point location and decreasing out to ½ mile radius from the point location.
Transit	20	Transit stops grouped into quartiles based on annual ridership data. Stops assigned scores based on which quartile they fall, e.g. top quartile = 20 points, bottom quartile = 5 points. Scores graduated from the maximum score within a ¼ mile radius from the point location and decreasing out to ½ mile radius from the point location.
Socio-economic accessibility	9	Census blocks grouped into quartiles based on their median income. Census blocks assigned scores based on which quartile they fall, e.g. lowest income quartile = 9 points, highest income quartile = 2.25 points.
Social Equity	9	Census blocks grouped into quartiles based on the percentage of non-white population.

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<b>Variable</b>	<b>Max Points</b>	<b>Methodology</b>
		Census blocks assigned scores based on which quartile they fall, e.g. highest quartile = 9 points, bottom quartile = 2.25 points.
Topography	(-5 points)	Negative points assigned to areas with steep topography. Areas with >3% average slope = -5 points; areas with >5% average slope = -10 points.
<b>TOTAL</b>	<b>100</b>	<b>Combined total of above scores</b>

Note that bicycle infrastructure is not included in the heat mapping analysis as it is not an origin or a destination in itself. Nevertheless, it plays a critical function in providing bike share riders a comfortable place to ride and as such will be used at the station planning level to locate stations as close as possible to bike infrastructure.

The results of the heat map are shown on **Figure 3.14**. As expected, the major concentrations of activity are around Downtown and Old Town with its concentration of employment, shopping, attractions, and transit; around CSU with its population of students, faculty and staff; student housing along Plum and Elizabeth Streets; and around the breweries along Lincoln Avenue. There are other activity zones along College Avenue and Harmony Road.

The outputs from the heat map were combined with public and stakeholder input to define the bike share service area and develop a phasing plan.

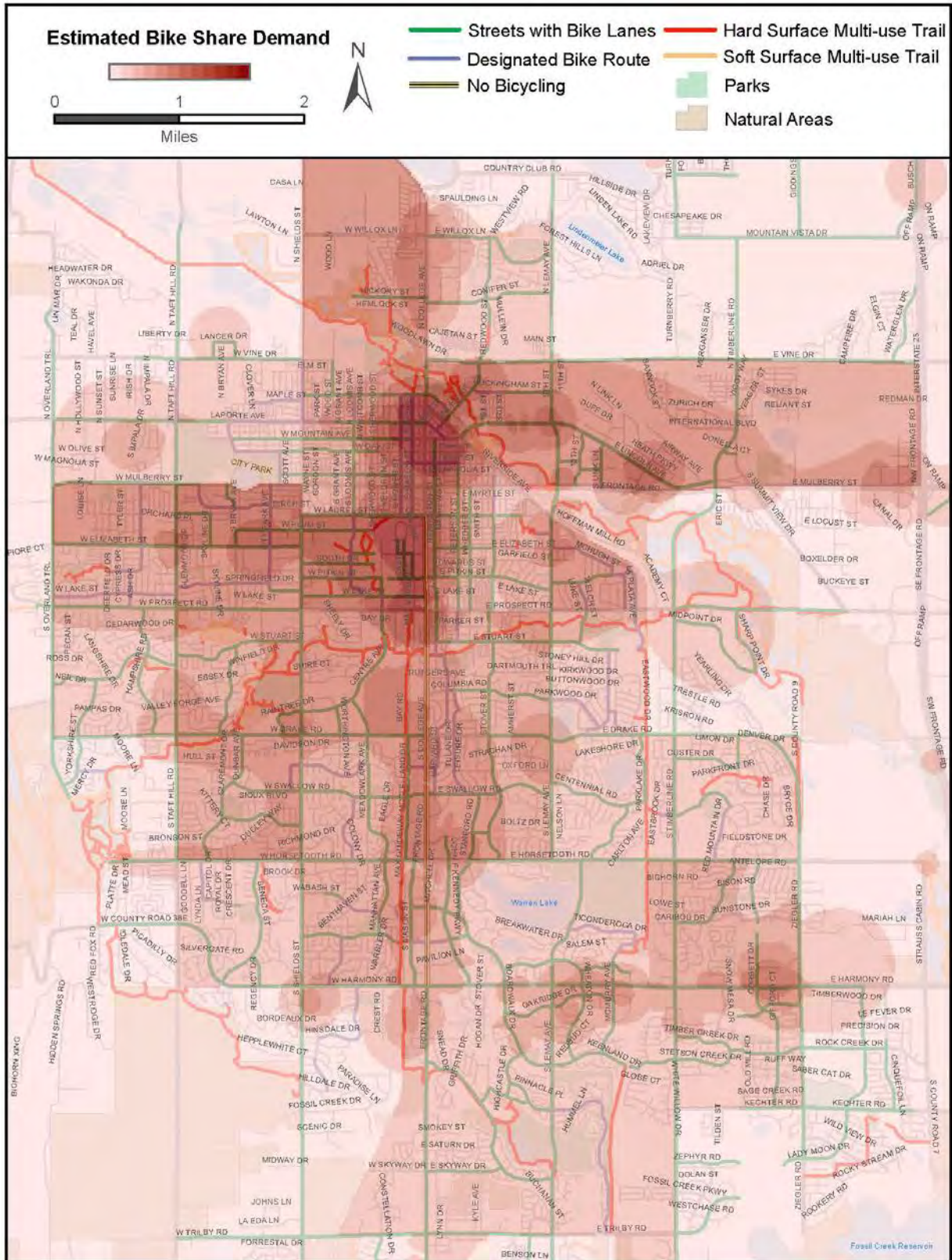


Figure 3.14: Bike Share Demand Analysis Results (Heat Map) for Fort Collins.



### 3.4 Public Input

This study included a number of opportunities for the project team to get input from the public about bike share in Fort Collins. Public outreach included a public meeting and an interactive web-based mapping tool.

#### 3.4.1 Public Meetings

On March 12, 2014 an Open House was conducted for the Fort Collins Bicycle Master Plan. The Open House included a station dedicated to the Bike Share Business Plan, where City staff presented information about bike sharing and its benefits, information about this project, a summary of comparable cities and their bike share systems, and locations for potential bike sharing locations in Fort Collins. Nearly 250 people attended the public meeting. Attendees were able to place dots on a map indicating where they would like to see bike share stations. Feedback received at the Open House showed that attendees are interested in bike share stations at high school locations, trailheads, retail hubs, and major transit/park and ride locations, with trailheads and trail connections to major streets being the most popular.

#### 3.4.2 Online Map

The project website ([www.fcgov.com/bikeshare](http://www.fcgov.com/bikeshare)) included a link to an interactive web map for the public to suggest locations for bike share stations. Users could suggest new locations or support an existing location.

More than 43 station locations were submitted using the mapping tool, with many locations being endorsed by multiple users. All suggested locations (and supporting comments) were exported as a GIS shapefile and added to the input received at the public meeting. This information was used to create the crowd-sourced map of suggested station locations shown in **Figure 3.15**.

### 3.5 Stakeholder Engagement

Input was gathered from numerous organizations during the course of the feasibility study. The bulk of the stakeholder engagement was conducted through a series of workshops conducted on February 27 and 28, 2014 in Fort Collins. Given the number of stakeholders, workshops were conducted in smaller groups representing transportation, public health, economic development and tourism, and community interest. Participants were asked to help identify opportunities and challenges and to provide a summary of how they thought their organization could be involved in bike share in Fort Collins.

Attendees were generally supportive of a bike share system in Fort Collins. In particular, organizations believed that bike share could help to encourage more bicycling, provide an important extension of the MAX transit service, and strengthen the brand of Fort Collins as a bicycle-friendly city to residents, businesses, and visitors. A summary of the key themes from these workshops is below:

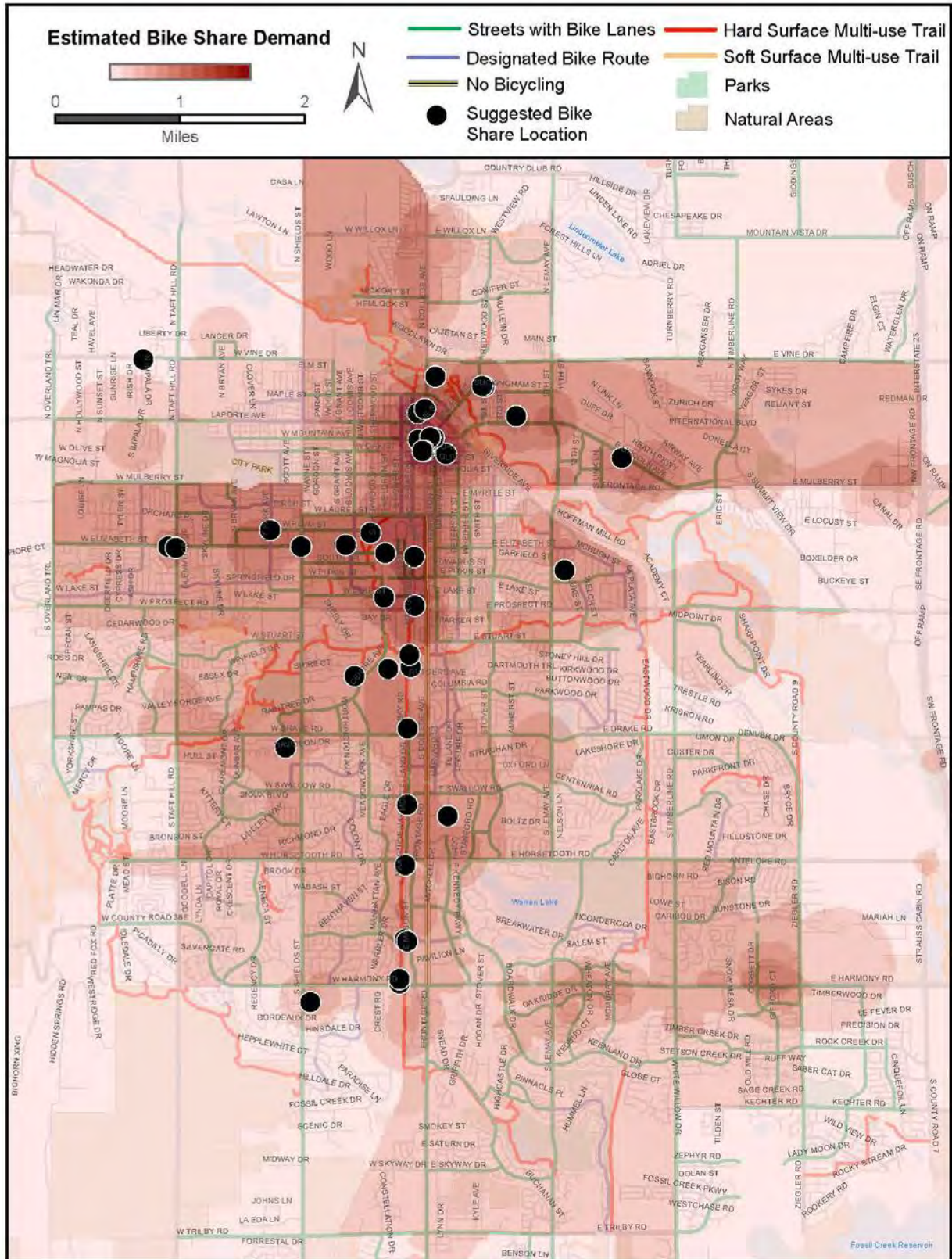


Figure 3.15: Crowd-Sourced Map of Publicly Suggested Bike Share Station Locations.

### **System Planning:**

- An initial system in Downtown, Old Town, on the CSU campus, and along the Elizabeth, Plum, and Lincoln corridors was well supported by stakeholders. The Harmony Road corridor was identified as a potential future phase, but may need to be preceded by more comfortable and safe bicycling infrastructure.
- A “financially-realistic” initial system is preferred with the potential for future phases through infill or geographic expansion.
- Serving lower income areas is an important goal but needs to be balanced with the financial realities of the system. Strategies to serve lower income areas (e.g., North College) should be a high priority.
- Although helmets are not required throughout Fort Collins, encouraging the use of helmets is important.
- Linking a potential bike share system to the MAX service is critical.
- Bicycling is an important part of the City’s brand to businesses, potential residents, and visitors. Bike share could be a way to further promote this brand.

### **Funding Plan:**

- Seeking sponsorship can be difficult and complicated. The sponsorship ask will need to promote the benefits and the assets of the system (e.g., visibility). The effort required for fundraising and sponsorship acquisition needs to be accounted for in the business model.
- Long-term financial sustainability needs to be considered. There is a need for contingency mechanisms under a possible sponsorship model, if sponsors do not renew in the long term (when bike share is no longer new).
- There is a need to get creative about funding and sponsorship. Innovative strategies like linking parking and bike share, crowd-sourcing, and other tools should be investigated.
- A contingency plan needs to be developed for if the full initial system can’t be funded. There is a need to come to a consensus as to what the minimum size of the system can be for it to be effective.

### **CSU:**

- CSU is a likely funding partner with potential funding sources including:
  - Parking and transportation revenues
  - ASCSU student fee
  - External relations for advertising revenue
- CSU is an important partner and will bring a high number of potential users. There are numerous locations on- and off-campus that could support bike share stations.
- CSU has a restriction of no advertising/sponsorship allowed on campus. However, the University does have existing “product partnerships” to provide exclusive use of these products on campus. Further, the University itself may be interested in taking up sponsorship of the bikes or other system infrastructure.

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### **Bike Library:**

- The Bike Library is an important community asset and should be integrated into an automated bike share system. The final proposed pricing structure for a potential bike share system should reflect the needs of the community and should help promote both systems.
- An automated bike share system is an opportunity to increase and improve the current services of the Bike Library.

### **Transportation/Permitting:**

- The City's regulations provide a number of barriers to advertising and sponsorship. For stations in the public right-of-way the City does not allow private advertising in general; however Transfort has an existing contract with advertising agencies that allows advertising on bus benches and shelters and on buses. It might be possible to expand these opportunities to include advertising (or sponsorship) of the bikes and stations of the bike share system. For stations not in the public right-of-way, the City's Sign Code does not allow off-premise advertising, and a variance would need to be requested from the Zoning Board.
- On-street stations would be considered in the right context by the Engineering Department, e.g., considering the type of street, speed and volume of traffic, presence of a bicycle facility, etc.

## **3.6 Preliminary System Plan**

The results of the previous sections were used to plan the initial bike share system service area. In particular, the results of the community analysis and feedback received from the public and local stakeholders were used to define the boundaries of the first phase of the system, as well as the number of potential stations and bicycles.

**Figure 3.16** shows the proposed Phase 1 boundary overlaid on the heat map and the station crowd-sourcing map. The proposed service area includes Downtown, Old Town, CSU, the Lincoln Corridor, and the Elizabeth Street corridor. In total, this represents an area of 4.4 square miles. The system is divided into five "deployment zones" described in **Table 3.4**. The size of each zone (i.e., the number of stations and bicycles), was developed based on:

- Typical station densities observed in peer cities which range from 4 to 6 stations per square mile (see **Table 2.1**).
- Capital funding capacity, which requires that a phase not be so large that it could not be realistically funded.

The proposed phasing does not preclude future expansion into other areas, and in particular future phases would logically include creating east-west connections from the Midtown and southern MAX stations, connecting the Harmony MAX Station and South Transit Center with Front Range Community College and the hotels and business parks along Harmony Road.

Expansion depends on a number of factors and should only be considered after an initial operating period when operation of the system is better understood and can generate interest for supporting expansion. The phasing of

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bicycle infrastructure improvements that will be recommended as part of the City’s Bicycle Master Plan update should also be considered in developing future phases.

In addition, the phasing does not preclude more stations being included in Phase 1 so long as there is a sustainable funding plan in place to support these additions. For example, CSU may be interested in increasing the number of stations on its campus in the initial phase.

**Table 3.4: Proposed Phase One Station Density**

	<b>Downtown/ Old Town</b>	<b>Lincoln Corridor</b>	<b>CSU Main Campus</b>	<b>CSU Veterinary Campus</b>	<b>Elizabeth Corridor</b>	<b>Other</b>	<b>TOTAL PHASE 1</b>
Area (square miles)	1.1	0.8	1.0	1.0	0.5	-	4.4
Stations	7	2	5	2	2	2	20
Station Density (stations/sq.mi.)	6.4	2.5	5.0	2.0	4.0	-	4.5

General station locations were identified for the initial phase of the system to within a 2 to 3 block area and station sizes were determined based on the demand analysis. Potential station locations include:

Downtown / Old Town / Breweries

- Downtown Transit Center
- Library
- Discovery Museum
- Old Town Square
- Mountain MAX Station
- Lincoln Center
- Olive & College
- New Belgium Brewing
- Odell Brewing
- North College
- Poudre Valley Hospital

CSU and Surrounding areas

- Laurel MAX Station
- University MAX Station
- CSU Transit Center
- South Campus
- Moby Center
- CSU Veterinary Hospital
- The Gardens on Spring Creek
- Campus West
- West Elizabeth

Specific station locations will need to be confirmed and the appropriate permits obtained prior to deployment.

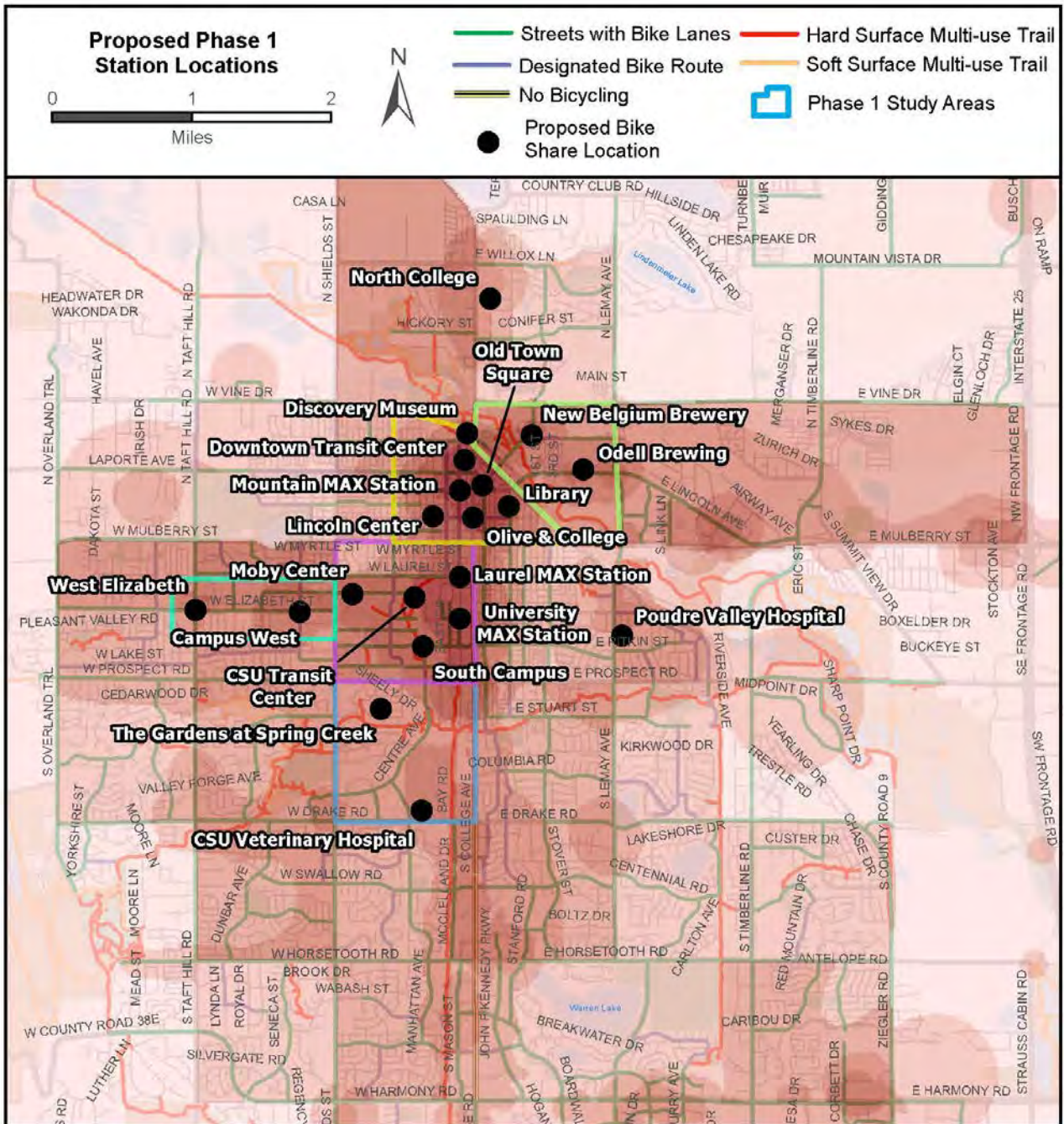


Figure 3.16: Proposed Phase One Stations for a Bike Share System in Fort Collins.



# Business Model

## 4 Business Model

One of the key decisions of the Bike Share Business Plan is to select a business model for the program. In general, the following functions are required to mobilize and operate a bike share system:

- Obtain political, public, and financial support
- Fundraising for initial capital and early operating costs, e.g., one year of operating funds
- Procurement of the equipment vendor and the operator. These decisions could be made together or separately
- Contract administration
- Ownership of the system and its assets
- Operations
- Evaluation and expansion decisions

These functions could be undertaken by one or more organizations. Existing U.S. bike share programs operate under different business models depending on the jurisdiction's funding environment, institutional capacity, and local transportation needs. The relationship between system owners and system operators in U.S. bike share systems is shown on **Figure 4.1**. The most common models are those owned by cities and operated by a private contractor, non-profit owned and operated, and privately owned and operated.

The role of the city, non-profit, and private sectors in owning and managing a potential bike share program in Fort Collins is evaluated in **Table 4.1** in terms of key operating criteria (such as funding and implementation) and local priorities identified by regional stakeholders at the first TAC meeting. The evaluation criteria included:

- Who will own the system and be responsible for fundraising capital funding?
- Who will operate the system and be responsible for fundraising operations funding?
- What potential funding sources are available under this business model?
- What is the organizational capacity and interest for this model?
- Does the model allow for quick and nimble mobilization?
- How does the model meet local priorities including:
  - Bike share complementing and extending transit services
  - Introducing new riders to bicycling and increasing the importance of bicycling to Fort Collins
  - Ensuring the system is accessible and affordable to all socio-economic groups

The role of these same organizations in operating a potential bike share system in Fort Collins is evaluated in **Table 4.2**.



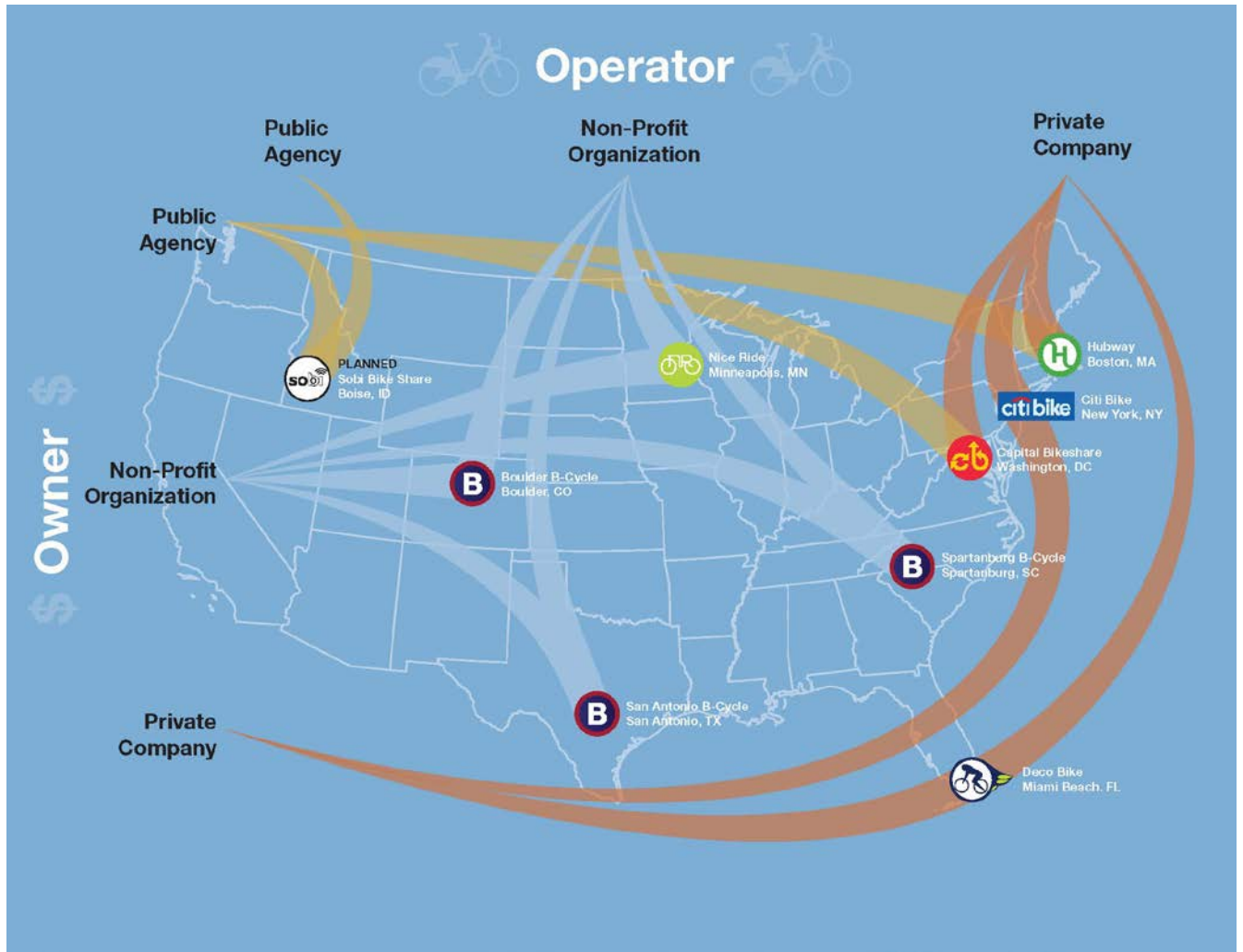


Figure 4.1: Relationship between System Owners and System Operators in U.S. Bike Share Systems

Table 4.1: Evaluation of Potential Ownership Models in Fort Collins

Model	Capital Fundraising Responsibility	Operations Fundraising Responsibility	Potential Funding Sources	Organizational Interest / Capacity	Speed / Nimbleness	Priority #1: Complement Transit	Priority #2: Promote Bicycling	Priority #3: Affordability and Accessibility	Other	Examples
<b>Existing or New Non-profit</b>	Non-profit with City support	Non-profit	● City, state, federal, private, foundations.	● Interest or capacity may already exist or could be created with a new non-profit.	◐ Existing non-profit (such as Bike Fort Collins) already has many of the necessary structures in place.	◐ Important to the success of the system, but not a primary mission. Wider transit decisions out of the control of the non-profit.	◐ Important to success of the system, but not a primary mission. Wider decisions on bicycling out of the control of the non-profit.	● Pricing structure can be controlled. Social equity is consistent with the community responsibilities of a non-profit.	◐ Broad community support for non-profit partnerships.	Aspen WE-Cycle, Boulder B-Cycle, Denver Bike Sharing, Madison B-Cycle, Nice Ride Minnesota (Minneapolis).
<b>City</b>	City	City	◐ City, state, federal, private.	◐ City has proven interest in similar programs, e.g., Bike Library. Would need to add staff.	● Fastest because no agreements / contracts required.	● Transfort housed within agency structure. Transit decisions could include consideration of bike share.	● City places high priority on bicycling infrastructure. Bicycling policy decisions could include consideration of bike share.	◐ Fee structure can be controlled. Social equity is consistent with agency goals and responsibilities.	◐ Maximizes transparency of financing and decision making.	Chattanooga Bike Transit System, Capital Bikeshare (Washington D.C.); Hubway (Boston)
<b>Private</b>	Private Contractor	Private Contractor	◐ Private.	◐ Interest will depend on financial performance evaluation and fundraising capacity. Staff capacity can be created.	◐ Procurement will be required to select contractor. Capacity can be determined through this process.	◐ Important to success, but not primary mission. Wider transit decisions out of the control of the contractor.	◐ Important to success, but not a primary mission. Wider decisions on bicycling out of the control of the contractor.	◐ Price structure may need to reflect financial performance. Expansion likely to be demand-driven.	● Private sector brings established skills and experience.	DecoBike (Miami); Citi Bike (NYC)

Legend: ○ least favorable for this category   ◐ Somewhat favorable   ◑ Average   ◒ Favorable   ● Most favorable for this category

Table 4.2: Evaluation of Potential Operator Models in Fort Collins

Organization	Ownership and Capital Funding	Operations and Operations Funding	Potential Funding Sources	Organizational Interest / Capacity	Speed / Nimbleness	Priority #1: Complement Transit	Priority #2: Promote Bicycling	Priority #3: Affordability and Accessibility	Other	Examples
<b>Existing or New Non-profit</b>	City or non-profit	City or non-profit	● City, usage revenues, sponsorship, private foundations.	● Interest or capacity may already exist or could be created with a new non-profit.	◐ Existing non-profit (such as Bike Fort Collins) already has many of the necessary structures in place.	n/a	n/a	n/a	● Broad community support for non-profit partnerships.	Aspen WE-Cycle, Boulder B-Cycle, Denver Bike Sharing, Madison B-Cycle.
<b>City</b>	City	City	◐ City, usage revenues, sponsorship.	◐ City has little interest in operating the program. Would need to add staff.	◐ Would need to build capacity and skills.	n/a	n/a	n/a	● Maximizes transparency of operating decisions.	Boise (planned 2014)
<b>Private</b>	City, non-profit, or private	City or private Contractor	◐ City, usage revenues, sponsorship.	● Interest will depend on financial contract. Staff capacity can be created (or in some cases exists).	◐ Procurement will be required to select contractor. Staff capacity can be built. Skills already established.	n/a	n/a	n/a	● Private sector brings established skills and experience.	Capital Bikeshare, DecoBike (Miami); Citi Bike (NYC)

**Legend:** ○ least favorable for this category   ◐ Somewhat favorable   ◑ Average   ◒ Favorable   ● Most favorable for this category

## 4.1 Non-Profit Organization

A non-profit organization is a solid candidate to own the bike share program, operate the program, or both. The selection of or creation of a non-profit organization specifically charged with managing bike share has been a popular way for small- to medium-sized cities to implement bike share programs. Funding for equipment typically comes to the non-profit in the form of public, private and philanthropic sources. The ongoing financial liability for operations and additional equipment falls to the non-profit organization. As a result of the constant fundraising need, a large percentage of staff time may be committed to this activity.

While non-profit organizations tend to be nimble and adaptive, the creation of such an entity may require organizational and possibly financial support from a local government agency in its first few years. There are also some issues with organizational capacity as the non-profit will often also be responsible for operations and potential expansion as well as fundraising and sustainability.

It is important to note that all other bike share programs in Colorado (i.e., Denver, Boulder, and Aspen) are owned and operated by non-profit organizations.

*Advantages:* fundraising diversity, community-oriented mission of the non-profit organization aligns with many of the goals of bike share, transfers risk and ongoing financial responsibility from the City, maintains some level of transparency through board representation and public reporting requirements, profits are reinvested into the system.

*Disadvantages:* financial and operating performance are not the only priorities, skills and experience will need to be learned over time, typically no performance standards for operations, long timeframe for non-profit organization creation and capacity building.

## 4.2 City

Another popular business model in U.S. bike share systems is for the City (or other agency) to own the program and administer a contract with a non-profit or private organization to operate the system. This is similar to how the City currently manages the Fort Collins Bike Library. Cities have typically not been involved with operating bike share programs in the United States, however that may change with several systems proposed to follow this model.

Under city ownership, a local public agency owns the system infrastructure, including the stations and bicycles, and is responsible for fundraising. The agency can decide which other functions it takes responsibility for and which it contracts to a third party (e.g., marketing and promotions, operations, etc.).

The City can access and program various sources of federal funding including CMAQ funds, health related grants (such as the Centers for Disease Control), as well as other Surface Transportation funds. Furthermore, with its existing relationships with local stakeholders, funders, and sponsors, the City may be able to access additional private funds.

By directly managing the program, the agency would maintain full control over setting performance and operating standards as well as making decisions on where the program expands. Staff capacity (more than likely a dedicated full time position) would be required to manage the program. In many ways, this model is similar to

transit in Fort Collins with Transfort being a part of the City structure. Examples of agency owned and managed programs include Capital Bikeshare (Washington, D.C.) and Hubway (Boston).

*Advantages:* maximizes agency control and transparency, offers fundraising diversity, organizational goals align with promoting greater use of bicycling and transit and supporting broader transportation goals, profits can be reinvested into the system, and makes use of the established skills of private operator.

*Disadvantages:* risk and ongoing financial responsibility are taken on by the City, financial and operating performance are not the only priorities, some difficulty in spanning jurisdictional boundaries.

### 4.3 Private Organization

The private sector tends to bring established skills and experience to both ownership and operation of a bike share program. However, except in financially viable markets (e.g., New York and Miami have large visitor and tourist markets) the private sector may not be interested in owning the system.

In a privately owned bike share system, the City would need to be involved in the initial procurement and contracting process and in initial planning and permitting of stations within the public right-of-way. Some cities have also included some sort of profit-sharing arrangement. The private company is responsible for all fundraising including for capital and operations as well as for implementing and operating the system, however funding sources are more limited under this arrangement (e.g., grant funding and private foundations may not be eligible funding sources).

The private sector brings established skills in fundraising, marketing, and operations that would need to be learned in a city or non-profit operated model. This model will depend entirely on the interest of a private company and the potential financial performance of the system. In many smaller and mid-sized communities, this interest has not materialized.

*Advantages:* removes risk and financial responsibility from the City if the private sector is interested in owning the system, private operator motivated to ensure visible success of the program (e.g., high ridership and profitability), makes use of established skills in the private sector.

*Disadvantages:* minimal agency control and less transparency than other models, traditional funding options may be limited or difficult to obtain for a private company, agency has less control over use of profits, typically oriented to market-driven expansion of the system making it difficult to achieve accessibility goals.

### 4.4 Integration with Fort Collins Bike Library

Fort Collins is in the unique position of having a very successful Bike Library that has recorded over 20,000 check-outs since it was started in 2008. The Bike Library is prized in the community for its role as a visitor attraction/amenity. For this reason, the City extended funding for the Bike Library beyond 2012, when the latest CMAQ grant funding was completed.

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The City recently commissioned a study to determine the role of bike share in Fort Collins and in particular, whether both an automated bike share system and the Bike Library may be able to operate. The study concluded that an automated bike share system should be established and should be complemented by the Bike Library which should remain open until a determination can be made on whether the two systems can coexist.

One possible option is for the City to leverage the current operating model and integrate operations of the Fort Collins Bike Library with a new automated bike share system. There are some advantages to combining these functions including:

- An existing structure and relationship with the City that would simplify contracting and expedite implementation
- Existing partners and membership base that could be interested in expanding their involvement to the bike share program
- An established presence in the community and a single organization to represent bike share offerings in the City
- Existing face-to-face customer interaction
- Staff, skills, and existing programs that could be utilized or built upon
- Economies of scale, e.g., expanding the existing operating space, utilizing maintenance staff, tools and equipment, marketing and advertising, etc.

Operating the two programs together would require the operator of the Bike Library to introduce the necessary skills and capacity to operate both programs. To be consistent with bike share, and to generate additional revenue for the Bike Library, consideration should be given to charging a fee for Bike Library rentals.

#### 4.5 Recommendation

There are advantages and disadvantages to all of the business model types. However, the evaluation included in this study shows that a **City owned and managed system with a non-profit or private operator** would best meet the needs of the community and the priorities identified by local stakeholders. Further, an automated **bike share program should be an expansion of the offerings of the Fort Collins Bike Library**. In determining the operator, the City should encourage all proposals through an open Request for Proposal process and evaluate each proposal on its merits.

Initial discussions with City staff indicate that the City has the organizational interest and could create the capacity to undertake this model. This will require dedicated staff to fundraise, navigate the procurement process, undertake contract negotiations, administer the operating contract, and evaluate and set the direction of the program. However, this is consistent with how the Bike Library is currently managed and the expanded range of services could be operated utilizing the existing contractor or another non-profit or private contractor selected through an open RFP process.

##### *Challenges:*

- The City would need to increase its organizational capacity to take on responsibility for the program. This is likely to require an additional staff person that could be funded through the City's Budgeting

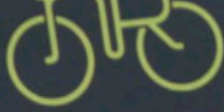
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for Outcomes (BFO) program. Initial budget programming requests are due in April 2014 for 2015/2016 allocations.

*Opportunities:*

- Transfort, as a part of the City of Fort Collins, provides access to funding mechanisms and existing relationships with advertisers and sponsors.
- A city-managed system provides the City full control over its planning, direction, brand and image, and an opportunity to incorporate and expand the services of the Bike Library.

change



WIDE MINNESOTA SYSTEM



Phase 1  
2012

# Financial Analysis

WH.



## 5 Financial Analysis

This section explores the financial needs and performance of a bike share program in Fort Collins and provides a funding plan for pursuing needed funds, based on the aforementioned recommendations.

A financial pro-forma was prepared to understand the capital, installation, and operating costs of the proposed bike share system and to forecast potential revenues. The pro-forma looks at a five year initial operating period, which is a typical contract length for bike share in the United States. It also considers the sensitivity of a number of assumptions, e.g., the impact of lower or higher than expected ridership.

The funding plan takes the results of the financial analysis to understand the level of funding that is expected to come from membership and user fees and explores what other funding sources are available to meet capital and operating funding requirements. This includes a review of possible federal and state funds as well as a review of the role that advertising or sponsorship might play in funding the program.

### 5.1 Financial Pro-Forma

The financial pro-forma includes a five year look at expected program costs and revenues and is built based on the system planning and business model recommendations established in earlier sections of this business plan. The pro-forma includes numerous inputs. Where these variables were unknown, information was gathered from membership, ridership, and financial data for 18 existing systems of various sizes across North America.

#### 5.1.1 System Size and Phasing Assumptions

The initial system size recommended in Section 3.6 was used to develop the financial pro-forma. This includes 20 stations / 200 bikes / 380 docks assumed to launch in August to coincide with the start of the academic year at CSU.

#### 5.1.2 Business Model Assumptions

The financial model assumes that the system is owned and managed by the City and operated by a third party (i.e., non-profit organization or private operator). The City would manage its role through a combination of a new full time Bike Share Coordinator staff position and existing staff taking on specific roles (e.g., procurement, permitting, financial administration, etc.). It is assumed that the following functions are outsourced to third party contractors:

- Site planning and implementation.
- Operations.
- Marketing and promotion.

#### 5.1.3 Capital and Installation Costs

The financial model assumes the system is a smart dock system and that each station includes 10 bikes and 19 docks. Based on an average of recent prices for the major bike share equipment vendors in the United States, a 10 bike/19 dock station represents a total cost of \$43,000 per station that includes the base equipment plus shipping and other fees, spare parts, system keys, stickers and a system map.

Each station costs approximately \$2,000 to install. This includes assembly and installation labor and equipment and administration. It is assumed the agency takes on site planning and permitting (a saving of approximately \$2,000 per station).

A sensitivity test of the impact of converting to a smart bike system is included in Section 5.1.10.

#### 5.1.4 Pre-Launch Costs

The financial model includes two types of costs during the pre-launch period:

- **Agency Administrative Costs, Pre-Launch:** this represents a cost of \$40,000 to the City for a new full-time Bike Share Program Coordinator to manage the program and administer the operating contract with salary and benefits for a period of six months in the lead-up to launch. Additional roles during the intensive startup effort, e.g., staff for equipment and operator procurement, contract negotiation, grants and sponsorship acquisition, inter- and intra-agency coordination, stakeholder outreach (City Council members, community groups), public outreach on station siting (residences and businesses near station locations), general public meetings and any outreach for low-income communities are assumed to come from existing staff positions.
- **General System Startup Costs, Pre-Launch:** these represent costs to the operating contractor for the startup of any system, regardless of size. An overall general system start-up cost of \$187,000 is included in the pro-forma and includes:
  - Six months' salary for senior management and administration including the General Manager, Operations Manager, Administration, etc.
  - Administrative costs such as insurance, legal and accounting.
  - Marketing costs such as hire of an agency to establish the name and brand of the system, website development, and marketing materials (brochures, collateral, etc.) and event staff.
  - Direct operational costs such as real estate acquisition for this period, vehicle costs, purchase of uniforms and equipment and employee training.

#### 5.1.5 Operational Costs

The pro-forma includes three types of operational costs after the "go-live" date:

- **General Operations Costs, Post-Launch:** these costs represent everything needed to keep the system operational, including rebalancing, bicycle maintenance, station maintenance, customer service, software support, reporting, insurance, and all other day-to-day operations. It should also be noted that the cost included in the pro-forma include system marketing. The operational cost is presented on a per-dock-per-month basis. This approach is taken for several reasons:
  - a) Docking points (docks) are the most accurate representation of a system size, and represent stable infrastructure, as opposed to a bicycle fleet, which varies on a daily basis due to repairs, rebalancing and seasonality.
  - b) Several system contracts include payment by this method, and data from several systems show ranges for this metric.
  - c) It is easily scalable as a system expands.

The pro-forma assumes a per-dock-per-month general operating cost of \$75. Systems operate anywhere between \$38 and \$120 per dock per month. The operating cost will ultimately be determined by (1) the negotiated price and agreed-to service levels with the operator; and (2) operational efficiencies that can result in cost reductions (e.g., use of City-owned property for operating space). A certain amount of spare parts replacement will be covered by warranty and/or equipment insurance and therefore is not included in the financial model. However, some annual spare parts and bike replacement has been included for theft, vandalism and regular wear and tear.

- **Agency Administrative Costs, Post-Launch:** after the initial launch period, the City will need a full-time Bike Share Program Coordinator to manage the program and administer the operating contract. A cost of \$80,000 per year has been included in the pro-forma and includes salary and benefits.

### 5.1.6 System Revenue

There are three basic drivers of system revenue – annual membership, casual membership, and usage fees. For revenue forecasting, the pro-forma assumes a similar pricing structure to other bike share system shown in **Table 5.1**. The model of a membership fee, free-ride period, and usage fees for longer rides, has some shortcomings and may not be the final price model, however for the purpose of the business pro-forma there is significant data about membership and ridership assumptions using this structure.

Table 5.1 Suggested Fee Schedule for Fort Collins Bike Share

Access Fee		Usage Fees		
		0-30 min.	30-60 min.	Additional Half Hours
Annual	\$65			
7-day	\$20	\$0.00	\$2.00	\$4.00
24-hour	\$7			

Revenue drivers and their related model inputs are outlined below:

- Annual Membership Revenues:
  - Annual Membership Fee: the model assumes a \$65 fee to become an annual member. This amount is in the range of current fees in the U.S. Opportunities for shorter time or discounted memberships are also possible, e.g., Boulder offers a discounted \$25 semester membership for students (or a discounted \$40 annual membership).
  - Members per 1,000 Population: the model assumes that the system will start out with 5.5 persons / 1,000 residents purchasing annual membership and growing 20% annually.

This represents similar membership rates to those in Madison and Boulder in Year 3 of operations (see **Table 2.2**).

- **Casual Membership Revenues**
  - Casual Membership Fee: the model assumes a \$7 daily fee to become a 24-hour member. This amount is in the range of current fees in the U.S.
  - Casual Members per Station per Year: casual members typically find out about a bike share system by seeing a station. Therefore, the pro-forma uses the metric of casual members per station to estimate casual members. The model assumes that Fort Collins will be slightly lower than its peer cities of Madison and Boulder (see **Table 2.2**) and attract 400 casual members per station.
- **Usage Fees: available data from other U.S. systems was used to estimate revenues coming from system usage fees.**
  - Rides per Member: data show a range of 15 to 30 rides per year per annual member amongst peer cities. The pro-forma assumes the average rate of 20 rides per year for Fort Collins. For casual members, data show a range of 1.3 to 2.6 rides per member. The pro-forma assumes 2.0 rides per casual member for Fort Collins.
  - Percent of Rides Incurring Usage Fees: data show that approximately 30 percent of casual trips and 2 percent of member trips incur usage fees. These numbers are consistent across the systems for which data is public.
  - Average Usage Fee Incurred: the average usage fee incurred by members ranges from \$4 to \$6 for annual member trips exceeding the free ride period and \$6 to \$10 for casual members exceeding the free ride period. The pro-forma assumes an average usage fee of \$5 for annual members and \$9 for casual members.

### 5.1.7 Impact of the Bike Library

The existing Bike Library has its own costs and revenues that need to be rolled into the financial pro-forma for the hybrid bike share/bike library model. There will be economies in being able to make use of existing staff, procedures, and equipment. Line items costs and revenues were taken from the Bike Library's proposed 2014 budget for operating at the Downtown Transit Center and include:

- **Program Expenses:** \$118,000 per year, including \$70,000 per year in staff time to open the kiosk for 24 hours per week (adjusted for seasonal demand) and 10 hours per week of support from Transfort staff.
- **Potential User Revenues:** \$41,000 per year in rental fees, which assumes 4,100 rentals per year (similar to existing demand with free bike rental) with a rental rate of \$10 per bike per day.

This does not include any expansion or changes to the existing service and that introducing a rental rate maintains the same demand for the service as currently.

### 5.1.8 Identified Funding

FC Moves has submitted an application as part of its annual Budgeting for Outcomes (BFO) process for funding to be allocated towards the combined Bike Library and automated Bike Share system in 2015 and 2016. The application included the following funding requests:

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- 2015 - \$475,000 broken down as follows:
  - Capital purchase and installation: \$250,000.
  - Bike Library operations: \$120,000.
  - New Bike Share Coordinator staff position (Q2-Q4): \$60,000.
  - First year operations contribution: \$45,000.
- 2016 - \$270,000 broken down as follows:
  - Continued operation of the Bike Library: \$120,000.
  - Bike Share Coordinator staff position: \$80,000.
  - Second year operations contribution: \$70,000.

This financial model assumes that the full amount of the request is granted for 2015 and 2016 and that in subsequent years, the request is renewed for the full amount of the Bike Share Coordinator's salary and benefits as well as the full amount required to continue operations of the Bike Library, but that the automated bike share contribution reduces by 10% each year as system revenues grow.

### 5.1.9 Forecast Results

Using the inputs above, the pro-forma was prepared to forecast membership, ridership, capital and installation costs, annual operating costs and system revenues for five-year operation of Phase 1. The output was checked against metrics from other systems to ensure consistency with actual results and then analyzed to understand the funding needs for capital and operations, and how this varies if some of the key cost and revenue drivers are varied. The forecast results are presented in **Table 5.2**.

Metrics from **Table 5.2** are summarized as follows:

- Membership and Ridership Metrics:
  - Trips / Bike / Day: used globally to measure system usage. The pro-forma predicts ridership of approximately 0.5 trips per bike per day in Year 2 (note that Year 1 is only a partial year of operations), growing to up to 0.7 trips per bike per day in Year 5. This compares to peer cities that range from 0.3 to 1.4 trips per bike per day.
  - Percentage of Casual and Annual Member Rides: the forecast output predicts a split of approximately 47% of rides made by casual users and 53% by annual members in Year 2, moving to 33% casual / 67% annual by the fifth year. This split is well within the range of other small to medium sized city systems.
  - Tourists per Casual Member: used as a metric to understand casual membership, the pro-forma expects approximately one casual membership for every 188 tourists. This is consistent with other small to medium sized cities.
- Financial Metrics:
  - Farebox Recovery: this factor is important in understanding the financial needs of the system. The pro-forma shows that approximately 39% of operating expenses will be recouped through membership and usage fees in Year 2, gradually improving to approximately 46% in Year 5. This is consistent with small to medium sized cities such as Boulder and Madison that operate at 35% to 45% (in their first few years of operation).

A summary of the five year funding need for implementing **Phase 1** includes:

- Capital and Installation Costs: Phase 1 requires funding of \$1.1 million, which includes capital, installation, system startup, and pre-launch agency administrative costs.
- Operating Costs: Phase 1 will cost \$2.6 million to operate for the first five years. This includes operating costs, system upkeep, post-launch agency administrative costs, and Bike Library operations.
- Revenue: Phase 1 will earn \$1.1 million in membership and trip fees during the first five years of operation (including new revenues from the Bike Library).
- Identified Funding: the FC Moves' BFO application includes a request for funding of \$750,000 in 2015/2016 and assuming future renewal of these requests, the City's contribution could be up to \$1.5 million over five years.
- Fundraising Need: \$850,000 is needed for capital for Phase 1. This may come from a combination of public and private sector funds. **The fundraising need for operations is approximately \$300,000. This is the amount that would be required from sponsorship or other funding and on an annual basis represents \$60,000 per year or \$300 per bike per year.** This is a reasonable expectation for sponsorship based on rates achieved in other cities (see Section 5.2.3).

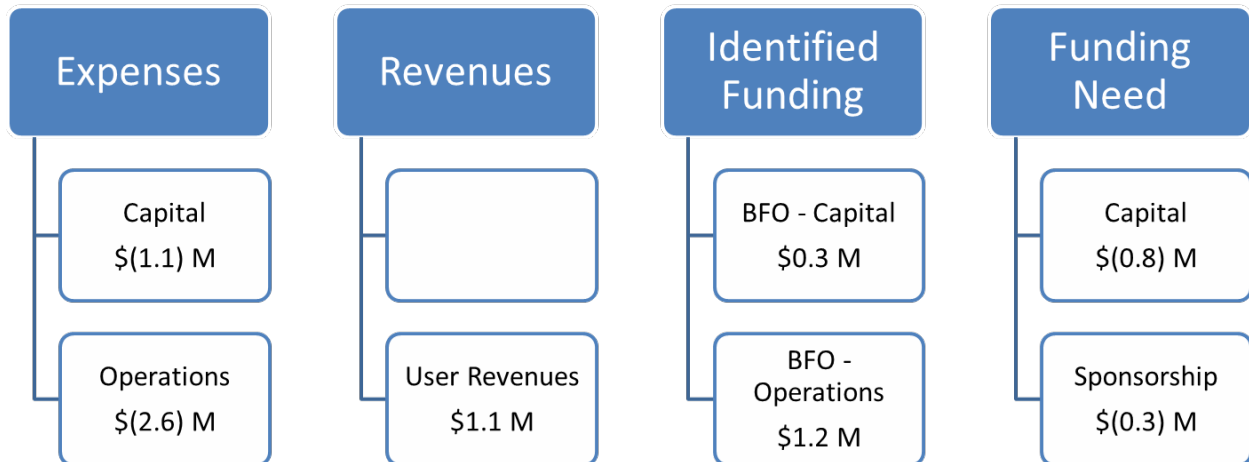


Figure 5.1: Summary of Bike Share Funding Plan.

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Table 5.2 Forecast Membership, Ridership, and Financial Performance for Phase 1 of the Fort Collins Bike Share Program

	Year 1	Year 2	Year 3	Year 4	Year 5	5-Year Total
<b>Stations</b>	20	20	20	20	20	20
<b>Bikes</b>	200	200	200	200	200	200
<b>Docks</b>	380	380	380	380	380	380
<b>Capital</b>						
Capital Purchase and Installation	\$(900,000)	-	-	-	-	\$(900,000)
System Startup	\$(187,000)	-	-	-	-	\$(187,000)
Agency Administrative Costs, Pre-Launch	\$(40,000)	-	-	-	-	\$(40,000)
<b>Total Capital and Administrative Cost</b>	<b>\$(1,127,000)</b>	-	-	-	-	<b>\$(1,127,000)</b>
<b>Identified Capital Funding</b>						
City Budget Capital	\$250,000	-	-	-	-	\$250,000
City Budget Administrative, Pre-Launch	\$40,000	-	-	-	-	\$40,000
<b>Total Identified Capital Funding</b>	<b>\$290,000</b>	-	-	-	-	<b>\$290,000</b>
<b>Capital Fundraising Need</b>						
<b>Total Capital and Administrative Fundraising Need</b>	<b>\$(837,000)</b>	-	-	-	-	<b>\$(837,000)</b>
Per Station	\$41,850	-	-	-	-	\$41,850
<b>Membership and Ridership</b>						
<b>Annual Members</b>	670	990	1,190	1,430	1,710	5,990
<b>Casual Members</b>	6,500	8,000	8,000	8,000	8,000	38,500
<b>Annual Member Rides</b>	8,100	18,100	22,400	26,800	32,200	107,600
<b>Casual Member Rides</b>	13,000	16,000	16,000	16,000	16,000	77,000
<b>Total Rides</b>	21,100	34,100	38,400	42,800	48,200	190,000
<b>Operations</b>						
Agency Administrative Costs, Post-Launch	\$(25,000)	\$(80,000)	\$(82,000)	\$(85,000)	\$(87,000)	\$(359,000)
Bike Share Operating Costs	\$(257,000)	\$(328,000)	\$(338,000)	\$(348,000)	\$(359,000)	\$(1,630,000)
Bike Library Operating Costs	\$(118,000)	\$(122,000)	\$(126,000)	\$(129,000)	\$(133,000)	\$(628,000)
<b>Total Operating and Administrative Costs</b>	<b>\$(400,000)</b>	<b>\$(530,000)</b>	<b>\$(546,000)</b>	<b>\$(562,000)</b>	<b>\$(579,000)</b>	<b>\$(2,617,000)</b>
<b>Revenues</b>						
Bike Share Revenues	\$125,000	\$165,000	\$179,000	\$195,000	\$214,000	\$878,000
Bike Library Revenues	\$41,000	\$43,000	\$45,000	\$48,000	\$50,000	\$227,000
<b>Total System Revenue</b>	<b>\$166,000</b>	<b>\$208,000</b>	<b>\$224,000</b>	<b>\$243,000</b>	<b>\$264,000</b>	<b>\$1,105,000</b>
User Fee Recovery	38.1%	39.2%	41.0%	43.2%	45.6%	41.7%
<b>Identified Operations Funding</b>						
City Budget Administrative, Post-Launch	\$20,000	\$80,000	\$82,000	\$85,000	\$87,000	\$354,000
City Budget Operations	\$45,000	\$70,000	\$63,000	\$57,000	\$51,000	\$286,000

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	Year 1	Year 2	Year 3	Year 4	Year 5	5-Year Total
City Budget Bike Library Operations	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000	\$600,000
<b>Total Identified Funding</b>	<b>\$185,000</b>	<b>\$270,000</b>	<b>\$265,000</b>	<b>\$262,000</b>	<b>\$258,000</b>	<b>\$1,240,000</b>
Operations Fundraising Need						
<b>Total Operating Fundraising Need</b>	<b>\$(49,000)</b>	<b>\$(52,000)</b>	<b>\$(57,000)</b>	<b>\$(57,000)</b>	<b>\$(57,000)</b>	<b>\$(272,000)</b>
Per Bike Per Year	\$245	\$260	\$285	\$285	\$285	\$272
Total Fundraising Need						
<b>Total Fundraising Need</b>	<b>\$(886,000)</b>	<b>\$(52,000)</b>	<b>\$(57,000)</b>	<b>\$(57,000)</b>	<b>\$(57,000)</b>	<b>\$(1,109,000)</b>



### 5.1.10 Sensitivity Analysis

The financial model shows that there is a difference between the cost of the system and user-generated revenues and already identified funding. One-time costs such as initial capital and installation lend themselves to one-time funding sources such as grants or private donations. Nevertheless the choice of equipment (i.e., smart dock versus smart bike) may reduce the capital funding burden (or purchase more equipment for the same price).

Ongoing operating costs are more difficult to fund and typically rely on user-generated revenues and sponsorship. Therefore, reducing operating costs and/or increasing revenues will reduce the amount of funding required from these sources.

A sensitivity test was conducted on the effect of varying certain assumptions in the financial model and the resulting impact on the five year capital or operating commitment. For example, reducing the equipment cost by 25% (e.g., using a lower cost vendor or a smart bike system) reduces the five year capital commitment by approximately 19%. This is the variable with the most impact. However, the result of decreasing other variables similarly is shown on **Figure 5.1**.



**Figure 5.1: Impact on Capital Funding Commitment with Variation in Capital Cost Assumptions.**

For operational funding needs, a similar sensitivity test was undertaken varying operational cost assumptions and testing the impact on the five year operational fundraising need, e.g., increasing the uptake of annual membership by 25% (which could be achieved through targeting marketing, etc.) would reduce the operating funding need by approximately 12%. The result changing other variables is shown on **Figure 5.2**.

The factors that most influence operational funding need are:

- The operating cost per dock per month: shown to decrease funding need by 43% for a 25% decrease in costs.

- The attraction of casual members (i.e., the number of casual members per station): a 25% increase in casual membership results in a 14% decrease in funding need.
- The uptake and price of annual membership: increasing the number of members or raising the cost of membership by 25% results in a 12% and 11% decrease in funding need. This assumes no offset in demand from raising the price.

These tests show that there may be value in exploring smart bike technology, which is typically lower cost per bike (although may be more costly to operate), finding ways to reduce operating costs (potentially through using existing City staff and resources to fulfill certain functions), and placing extra emphasis on casual and annual member recruitment.

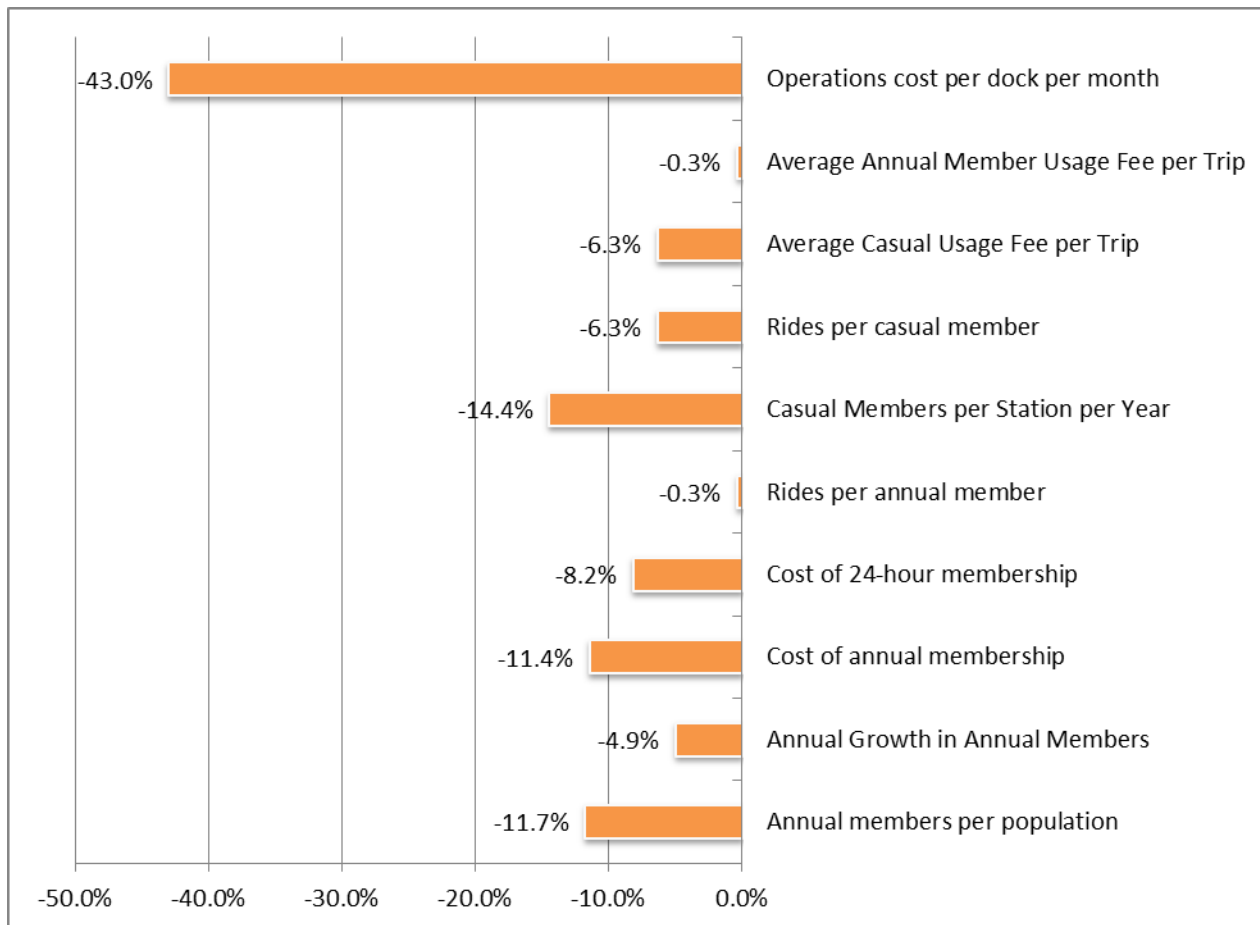


Figure 5.2: Impact on Operational Funding Need with Variation in Operating Cost Assumptions.

## 5.2 Funding Plan

Beyond membership and usage fees, bike share systems in the U.S. have generally used three other types of funding: public, private, and advertising/sponsorship. While most programs use a combination of funding sources, generally, public funds and private foundation grants are used towards capital costs whereas membership and usage fees and advertising/sponsorship revenues are used towards on-going operational costs.

### 5.2.1 Public Funding

Public funding sources include federal, state, and local funds such as transportation, health, and sustainability grants from agencies such as Federal Highways Administration (FHWA), Federal Transit Administration (FTA), Centers for Disease Control (CDC), Department of Health and Human Services (HHS), and the Department of Energy. There are often additional requirements to the use of these funds such as use only for fixed equipment, “Buy-America” provisions, NEPA requirements, etc. These funds are often less flexible in terms of timing. Approximately two-thirds of current bike share systems in the U.S. have used federal funding for capital costs.

The Federal Highway Administration has established a web page for addressing the U.S. DOT position on Federal Funding and Bike Share.<sup>51</sup> Bike share program capital costs are eligible under several Federal-aid highway program categories. **Table 5.3** reflects FHWA guidance that was updated June 13, 2013, to incorporate programs authorized under the Moving Ahead for Progress in the 21<sup>st</sup> Century Act (MAP-21).

**Table 5.3 Bike Share Eligibility by Federal Program (capital and equipment costs; operations not eligible)**

Program	Fund	Eligibility for Bike Share
FTA	Federal Transit Administration Capital Funds	YES
ATI	Associated Transit Improvement	YES
CMAQ	Congestion Mitigation and Air Quality Improvement Program	YES
HSIP	Highway Safety Improvement Program	NO
NHPP	NHPP/NHS: National Highway Performance Program (National Highway System)	YES
STP	Surface Transportation Program	YES
TAP	TAP/TE: Transportation Alternatives Program / Transportation Enhancement Activities	YES
RTP	Recreational Trails Program	NO
SRTS	Safe Routes to School Program	NO
PLAN	Statewide or Metropolitan Planning	NO
402	State and Community Traffic Safety Program	NO
FLH	Federal Lands Highway Program (Federal Lands Access Program, Federal Lands Transportation Program, Tribal Transportation Program)	YES
BYW	National Scenic Byways Program	NO
TCSP	Transportation, Community, and System Preservation Program	YES

Fort Collins has previously used CMAQ grant funding for operating the Bike Library. Advice from the MPO suggests that the next call for CMAQ and Transportation Alternative Program projects is not until 2015-2016.

<sup>51</sup> [http://www.fhwa.dot.gov/environment/bicycle\\_pedestrian/funding/faq\\_bikeshare.cfm](http://www.fhwa.dot.gov/environment/bicycle_pedestrian/funding/faq_bikeshare.cfm)

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The Colorado Department of Transportation's (CDOT) Division of Transit and Rail distributes grant money to local transit agencies as part of the Transit Grant Program of the Funding Advancement for Surface Transportation and Economic Recovery (FASTER) legislation. The Transit Grant Program is also responsible for administering FTA funds to station and local agencies for transit projects. Bike share is eligible for both programs with funds typically awarded every two years and requiring a 20% local match.

It is also advantageous to consider more localized public funding sources such as city or county capital improvement or community development programs. The City of Columbus used 100 percent local funds to cover the \$2.2 million needed for system infrastructure and launch of their 30 station/300 bike system that launched in July 2013. The city considered utilizing possible state and federal funding through the CMAQ program, but opted otherwise, as it would not have been able to receive the funds until 2016, therefore electing to utilize local funds to expedite the system launch.

The "Keep Fort Collins Great" sales tax may be a potential source for some funding towards bike share.

### 5.2.2 Private Funding

Private funding sources include grants from private foundations, private gifts and donations from individuals, and private investment. These sources are used in many U.S. cities, e.g. private funding makes up approximately 5 to 10 percent of funding in Boulder and Denver.<sup>52</sup>

Some other ways the private sector could get involved include large membership commitments and programs offered by employers, CSU, and the City. The EPA study identified a number of examples including:

- Bike share membership tied to existing transit pass programs, e.g., discounted memberships could be offered to CSU students willing to add bike share to the CSU transit fee.
- Bike share membership could be added to the offerings available to city employees.
- Corporate membership programs can be used to build enrollment by offering reduced annual membership rates and the opportunity for employers to sponsor all or a portion of membership costs for their employees. The City is well positioned to encourage employer support of bike share (corporate memberships or sponsorship) through its ClimateWise Social Superstars program.
- Developer incentives and parking offsets could be used to create a mechanism for a development to contribute to capital funding for bike share (including as part of new campus related housing).<sup>53</sup>

Many local companies may also be interested in sponsoring stations (e.g., Woodward, OtterBox, a consortium of local breweries). Kaiser Permanente, which is building its presence in the city and has sponsored bike share in other communities, could possibly serve as a large presenting sponsor (i.e., major sponsor whose branding benefits extend beyond a single station).

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<sup>52</sup> Boulder B-Cycle 2012 Annual Report. Denver Bike Sharing 2012 Annual Report.

<sup>53</sup> United States Environmental Protection Agency. *Planning for Bike Share Programs, Fort Collins*. May 24, 2013.

### 5.2.3 Sponsorship/Advertising

Sponsorship and/or advertising are an important element of most U.S. bike share systems. This will be no exception in Fort Collins and will be required to help fund operations. There are several levels of sponsorship that other cities have been able to achieve. Examples for each of the different levels are shown on **Figure 5.3** and include:

- Title sponsorship: includes branding of all elements of the system including name, color, and representation on all sponsorship elements including at the station, on the bikes, on electronic media, and all other components. Title sponsorship has only been achieved in a few systems around the world – New York (Citibike) and London (Barclay’s Cycle Hire) – and garner values upwards of \$1,000 per bike per year in those markets.
- Presenting sponsorship: in this type of sponsorship, branding is already developed, e.g. the bright yellow bicycles and the name Nice Ride Minnesota in Minneapolis. A single sponsor (such as in Minneapolis or Boston) or multiple sponsors (such as in Montreal) purchase the right for system-wide logo placement, typically on all bicycle fenders or at all stations and may negotiate for other sponsorship elements. In Minneapolis, Blue Cross Blue Shield have their logo and colors on every bike fender as well as placement on the program website and other media. However, other sponsorship opportunities are available to other organizations and bike and station sponsors can augment larger presenting sponsors. Presenting sponsorship garners in the order of \$400 to \$600 per bike per year.
- Individual sponsorship offerings: in this model sponsorship offerings are broken into individual elements and sold off to many smaller sponsors. This is often the model followed in the interim prior to presenting sponsorship (such as in San Antonio), but may also suit markets with smaller capacity or a desire for broader community support (such as in Boulder).

Overall, sponsorship will be required to support the bike share system in Fort Collins. The amount that will be able to be generated will depend on the specific assets offered (e.g., whether or not it can include an advertising panel). Based on the business pro-forma, Fort Collins requires \$180,000 per year in sponsorship to launch and support the 200 bike first phase. This equates to approximately \$900 per bike per year. Therefore, it is important that the organization managing the bike share program seek a title sponsor or presenting sponsor(s) for the Fort Collins bike share system.

In Fort Collins, the city code prohibits advertising in the public street right-of-way. Although the bikes themselves could carry advertising under this policy, it will impact advertising on the stations and kiosks and reduce the income generating potential of the system. Further follow-up is required with the City’s legal department to fully understand the restrictions, however, it may be possible to use a small space on the kiosk to provide “sponsorship information”.<sup>54</sup>

There is a precedent in Fort Collins where Transfort has contracted with advertising agencies for advertising on transit benches and shelters and on buses. Bike share, being an extension of transit may be able to file for a similar exception or become an extension of these existing offerings. Anecdotally,

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<sup>54</sup> <http://www.businessweek.com/articles/2013-10-31/citi-bike-citibanks-new-york-marketing-coup#p1>

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the average rate for advertising on a bus shelter or bus in Fort Collins is \$300 per month, with approximately half of this going to the City. Cities such as Seattle have successfully changed local ordinances to allow for sponsorship and advertising at streetcar stations and at future bike share stations.









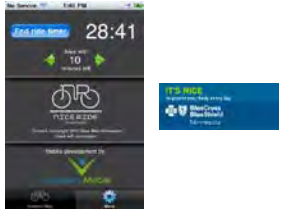






	Station	Bike	Bike Detail	Website / App	Membership Key
<b>Title Sponsor</b> New York City					
<b>Presenting Sponsor(s)</b> Minneapolis					
<b>Individual Sponsorship Offerings</b> San Antonio					

Figure 5.3: Sponsorship Examples.

Sources: Citibike, Nice Ride Minnesota, San Antonio B-Cycle, Denver Bike Sharing.

## 5.2.4 Potential Funding Plans

If the City's BFO offers for the Bike Library and Bike Share are funded, then the 20 station/200 bike first phase of a bike share system in Fort Collins will require an additional \$850,000 for start-up capital costs and an additional \$60,000 per year to cover ongoing operating costs. Capital funding could come from grant funding, other public funding or private contributions. The timeline for seeking and obtaining federal or state grant funding could push the project at least two years away. As a result, two possible funding plans have been developed – a “fast launch” scenario and a “long launch” scenario.

### Fast Launch

The fast launch scenario assumes that large federal and state grants will take time to materialize and if the goal is to launch a program by August 2015, then other sources of capital need to be found. FC Moves has applied to the City for capital funding of \$250,000 for 2015. This would purchase approximately 5 stations / 50 bicycles.

CSU is a critical funding partner and could be responsible for funding stations that are on or directly serving their campus. Based on the preliminary system plan in Section 3.6, this represents up to 10 stations (not all on University-owned property). The required \$450,000 capital investment for these 10 stations could come from parking and transportation revenues and opportunities for the University to advertise on these stations and an apportionment of bikes.

The remainder of stations could be funded through direct contributions from private foundations, large employers, business districts, large campuses (e.g., Poudre Valley Hospital), developers, and interested businesses. These arrangements will likely need to be incentivized with group or discounted membership for employees of these organizations, or providing sponsorship presence on the stations and bikes that they have purchased.

Smaller, more nimble health or social equity focused grants may be obtainable to fund stations where there are no obvious funding partners.

For operations, membership and usage fees are expected to cover approximately \$1.1 million over the first five years of the program leaving an approximately \$1.55 million operating funding shortfall. FC Moves has submitted a BFO application requesting City funding of slightly less than \$500,000 towards operation of the Bike Library and automated bike share system in 2015/2016. If this funding is approved and renewed (at slightly lower levels) beyond 2016, the City's total five-year contribution could be approximately \$1.25 million. This will leave a gap of approximately \$300,000 over five years or \$60,000 per year. Funding for this portion could come from an ASCSU student fee increase and/or sponsorship of the stations and bicycles not already committed to private entities that purchased stations.

### Long Launch

If the timing of launch is not critical, a more traditional funding approach can be taken where the City or other partners seek federal and state grants to raise capital. The local match (typically 20%) could come from FC Moves' BFO application to the City requesting \$250,000 in 2015. Experience in other cities has shown that



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federal and state grants can take up to two years for the funds to become available pushing launch out to August 2016 at the earliest.

All other funding sources would be put towards operating costs. Given the restrictions on advertising on the CSU campus, it would be critical that CSU fill in the revenue gap this creates by leveraging opportunities for parking and transportation revenues, ASCSU fee increases, and seeking the University's interest in sponsoring its stations and other stations.

Private partners could be sought, such as large employers, business districts, large campuses (e.g., Poudre Valley Hospital), developers and interested businesses to take part in group or discounted memberships and sponsorship opportunities.

These sources would need to cover the expected \$300,000 (five-year) or \$60,000 per year operating shortfall. Any additional revenues should be put towards operating a future system in areas of the city where user revenues and sponsorship revenues are expected to be lower. Federal and state grants would again be sought to fund expansion of the system into these areas of the city.

### **Other Strategies**

There are several ways to reduce the funding commitment. Capital costs can be reduced through consideration of different vendors and different technologies (note that there could be increases in operating expenses for reductions in capital cost) and operating costs can be reduced by looking for in-kind support or economies of scale (e.g., in utilizing the existing structure and capacity of the Bike Library, providing discounted or free operating space, etc.).



# Implementation

## 6 Implementation Considerations

This section addresses some of the common considerations that will need to be determined prior to or during implementation. Consideration and determination of a preferred direction for these and other characteristics should occur prior to the issue of an RFP to maximize the effectiveness of the responding proposals.

### 6.1 Policy Review

This section examined the following policies and regulations that might influence bike share implementation and operation in Fort Collins including:

- The City’s Municipal Code as it relates to right-of-way advertising.
- The City’s Sign Code as it relates to off-premise advertising on private property.
- The City’s policy prohibiting bicycle riding on College Avenue.
- CSU’s policy regarding bicycle licensing.
- CSU’s “dismount zone” on the CSU Mall.

#### **City Municipal Code and Right-of-Way Advertising Restrictions**

As previously noted, sponsorship will be required to support the bike share system in Fort Collins. The amount able to be generated will depend on the specific assets offered (e.g., whether or not a station includes an advertising panel).

In Fort Collins, the city code prohibits advertising in the public street right-of-way. Although the bikes themselves could carry advertising under this policy, it will impact advertising on the stations and kiosks and reduce the income generating potential of the system. Further follow-up is required with the City’s legal department to fully understand the restrictions - it may be possible to use a small space on the kiosk to provide “sponsorship information”. However, to maximize the income generating potential of the system, it may be necessary to seek a code change to allow sponsorship. There is a precedent for this in Fort Collins where Transfort has a contract with an advertising agency to sell advertising on city bus shelters. Bike share, being an extension of transit may be able to file for a similar exception. Cities such as Seattle have successfully changed local ordinances to allow for sponsorship and advertising at street car stations and at future bike share stations.

#### **City Sign Code**

For stations on private property, if signs are visible from the public right-of-way, the regulations of the City’s Sign Code come into effect. The sign code restricts the use of writing, illustrations, products, forms, and emblems placed on or near private property for the purposes of attracting attention, advertising, or announcement. Further follow-up is required with the City’s legal department to determine whether the restrictions extend to advertising / sponsorship on the bicycles themselves (given they are moving vehicles).

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Options for changing the Sign Code include going in front of the Zoning Board of Appeals for a variance, which may not be successful as it could set a precedent for relaxing the sign code, or to request a Code Change.

### **No-Riding on College Avenue**

The City currently does not allow bicycle riding on College Avenue. While this policy is still in place, this restriction should be shown on the bike share map, in safety messaging and in other education and outreach media.

### **CSU Bicycle Licensing Policy**

CSU currently requires every bicycle parked on campus to purchase and display a bicycle license. The bike share bikes are likely to be distinct designs and colors and could be exempted from this requirement.

### **No-Riding and Dismount Zones**

Currently, CSU requires that bicyclists dismount and walk their bike on the central mall. The dismount zone may be revisited in the update to the campus' Bicycle Master Plan, which should at the least consider allowing bicyclists to cross the mall on their bike at certain locations and provide an alternative north-south route for bicyclists to get between bike share stations. Restrictions (and alternative routes) should be displayed on the bike share system map and disseminated through other program media.

## **6.2 Station Siting**

This section addresses the station siting and permitting needs for implementing the first phase of the bike share system. General station locations were identified in the System Planning section of this report. As well, the project team worked with staff at the City of Fort Collins to understand the permitting process and station design considerations that will allow the future system operator to quickly work through the permitting process.

### **6.2.1 Permitting Process**

Station permitting can be a major time draw in the implementation of a bike share program. It is advised that a streamlined or bulk permitting process be established early in the project. It will be important to identify all the necessary forms and permits that need to be completed and establish the permitting and review process and timeline. It will also be important to get the necessary buy-in from all applicable agencies. This could include various departments of the City that may need to review the permit applications, public utility companies, fire and police departments, the local transit agency, Downtown Development Authority (DDA) for downtown locations, etc. Depending on location and funding conditions, additional agencies such as the state Department of Transportation or Historic Preservation Offices may need to be consulted. Public consultation and surrounding business outreach will also be an important part of the process to understand local conditions and concerns.

Based on conversations with the City of Fort Collins' Engineering Department, bike share stations would be subject to the City's encroachment permitting process.

## 6.2.2 Station Guidelines

The station locations identified in the System Plan will need to be verified in the field prior to deployment and may need to be relocated depending on right-of-way availability and ownership, physical space availability away from utilities and other obstacles, operating requirements such as solar and wireless communication access, and consultation with adjacent land owners.

Stations should generally be placed in safe, convenient, and visible locations and can be in the street, on sidewalks, or in parks and other public lands. They can also be located on private property through the use of a License Agreement with the property owner. In all instances stations should be available at all times to the public and to the operator for maintenance and bicycle redistribution. The following station guidelines are based on station siting guidelines developed in New York City.<sup>55</sup>

### General Requirements

- Sites should have unrestricted public access at all times.
- Sites should ensure maximum visibility and access.
- Sites must not impede any existing modes including sidewalks, traffic lanes, bus stops and emergency access.
- Sites need to meet the necessary solar (or non-solar) and cellular signal requirements specified by the equipment vendor.
- Sites should consider access for installation and for regular maintenance and rebalancing.

### Sidewalk Site Requirements

- Sites should not interfere with existing pedestrian travel patterns.
- Preferred minimum sidewalk width is 15-feet. However, sites with sidewalks less than 15-feet wide should consider the volume of pedestrians and existing travel patterns.
- Minimum clearances to objects such as bus-stops, building entrances, and utilities should be determined in consultation with the City's Engineering Department and other agencies as necessary.

### On-Street Site Requirements

- Guidelines for the use of on-street parking, in particular restricted parking areas, metered parking, no parking zones, no stopping zones, etc. should be developed in consultation with the appropriate City departments.
- Sites must be reviewed to ensure they meet appropriate safety criteria.
- Sites on lower volume and lower speed traffic streets are preferred. However, other streets can be considered where there is sufficiently wide space for a user to pull a bike from the station without encroaching into the traffic lane, or where there is a buffer provided between the station and moving traffic, e.g., a bike lane or painted buffer.
- Minimum allowable station width is 9-feet.

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<sup>55</sup> New York City DOT (2012). *NYC Bike Share – Designed by New Yorkers*. Report on Bike Share Outreach.

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- Stations may not be placed in bus stops, peak-hour driving lanes, clear zones, etc.
- Stations should be placed such that they allow drainage flow along existing curbs.
- Standard “safety treatments” should be developed in consultation with the City’s Engineering and Traffic Operations Department and may include street markings, bollards or other safety equipment.

#### Parks and Other City Property

- Sites may be placed on Parks Department or other City property at the discretion of the relevant agency.

#### Private Property

- Sites may be placed on private property at the discretion of the owner. If the private property is regulated by a City-approved development plan, an amendment to the plan may be necessary. The operator must secure a License Agreement to establish the terms of use, to transfer liability, and to ensure the site is accessible to the public at all times.

### **6.3 Performance Standards**

To achieve operational excellence, performance standards should be specified in a contract with an operator. However, the more stringent the performance standards, the more expensive contracted operations will cost. Therefore, the City must strike the right balance of operational excellence and affordability. These standards should include, but not be limited to, the following:

- System launch:
  - Delivery timeline
  - Site planning timeline
- System operations:
  - Bike redistribution metrics
  - Fleet size on street
  - On-street bike maintenance
  - Station cleaning (standard and graffiti)
  - Station technical maintenance
  - Station and docking point functionality
  - Customer service
  - System accuracy (station inventory, financial and ride reporting)
  - System and website functionality
- System marketing:
  - Membership
  - Ridership
  - Equity achievement

Basic performance level for each set of metrics should be defined, and the contract should include incentives to surpass the basic level, as well as liquidated damages for failing to meet that level.

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Reporting and evaluation will also be important. Each year, a summary report should be prepared that includes program highlights, operational performance metrics, and other system statistics including:

- System size
- Membership and ridership statistics
- Station performance
- Health impacts
- Economic impacts for users
- Economic benefit for the City
- Safety
- Operational efficiency
- Financial performance
- Emissions Reductions
- Impact on bicycle use
- Impact on transit use
- Impact on automobile use
- Shifts in transportation modes
- Impact on perception of cycling as a viable transportation mode

An annual survey of members should also be considered. This should include annual and casual members and if possible, non-members to understand why they don't join the program. The intention of the report is to evaluate system performance and make decisions about its future direction and emphases, e.g., the individual station performance statistics can be used to make decisions on expanding, reducing, or relocating stations to fine tune the performance of the system.

## 6.4 Implementation Timeline

The steps involved for implementation of a bike share system in Fort Collins are identified on **Figure 6.1**. These steps are generally categorized into:

- Procurement
- Funding
- Branding and Marketing
- Site Planning and Permitting
- Deployment
- Operations
- Launch

Funding is likely to be the critical path through the project with the timeliness of capital funding largely unknown and sponsorship needing to be obtained, often pieced together from various sources that require the attention of a dedicated staff resource.

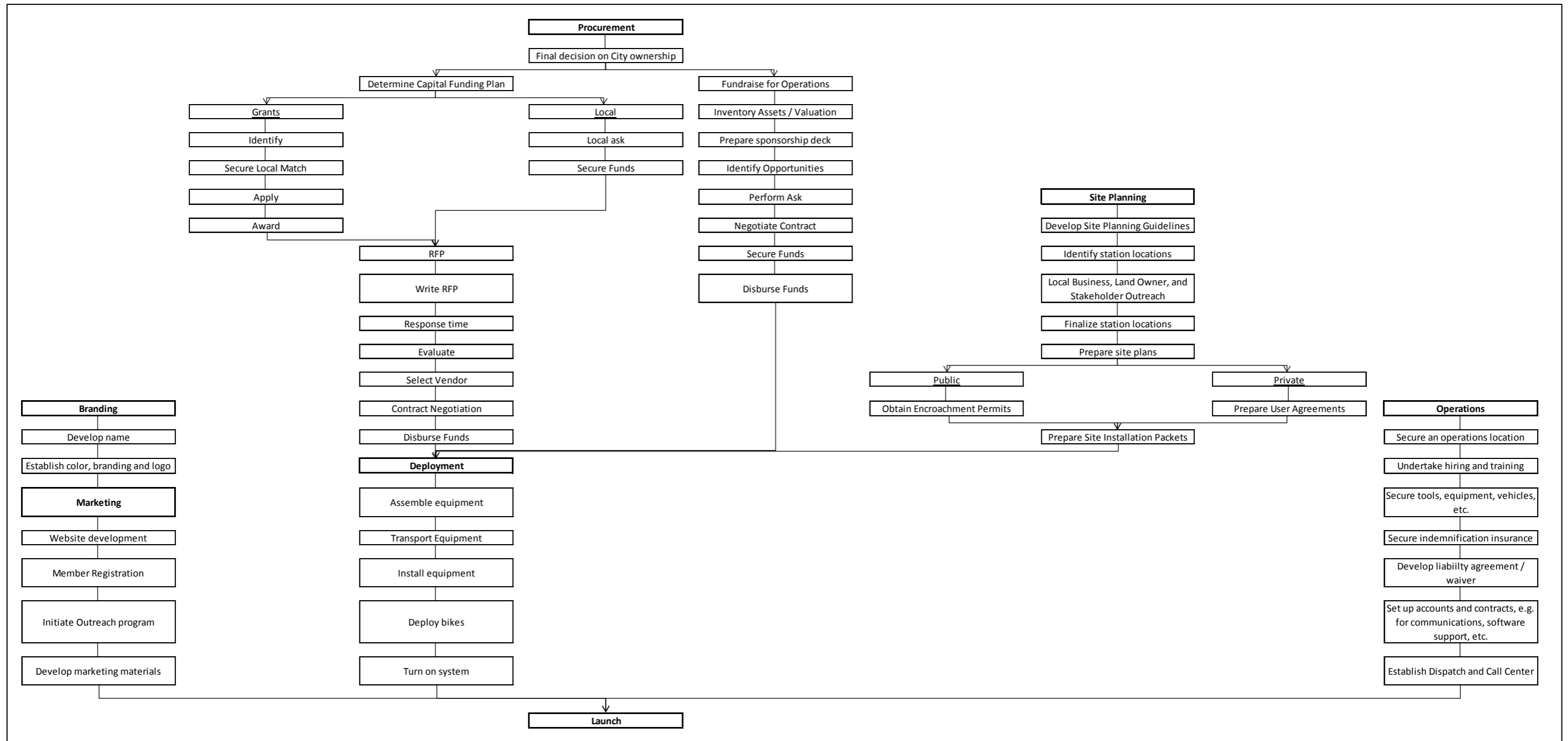


Figure 6.1: Implementation Flow Chart.





# Summary and Conclusion

## 7 Summary and Conclusion

The Fort Collins Bike Share Business Plan identifies the path to implementing a bike share system in Fort Collins, Colorado that will support existing and future transit services, connect destinations for visitors and residents and complement and potentially expand the services offered by the Bike Library.

An automated bike share system would help the City advance towards its goal of Diamond level Bicycle Friendly Community status, introduce new riders to the benefits of bicycling, and help promote the city as an innovative city to potential employers, residents, and visitors. An automated bike share system would augment existing services provided by the Fort Collins Bike Library and the two services together would offer a comprehensive set of options and fill an existing gap in the “bike rental / bike loan” market. It is recommended that the two programs be combined into a single operating contract for an “Enhanced Fort Collins Bike Library”.

Discussions with local stakeholders produced a number of anticipated goals for a bike share system in Fort Collins. Serving as an east-west connector for MAX transit was identified as a high priority. As well, although financial performance and sustainability was identified as a key priority, balancing this with providing access to the system for economically disadvantaged populations was also a high priority. With these considerations in mind, a “heat mapping” exercise was conducted to identify areas with the potential and areas with currently underserved populations. From this analysis, it was determined that an initial bike share system of approximately 20 stations should serve Downtown, Old Town, the CSU campus and the Elizabeth, Plum, and Lincoln corridors.

A number of business models were considered for an enhanced Bike Library and it is recommended that a City owned and managed system with a non-profit or private operator be pursued. This would provide the city with maximum funding flexibility as well as full control over the operation and direction of the program. New staff capacity would be needed to manage the functions of the system and in particular during the busy period leading up to system launch.

Information from comparable cities including Boulder, Denver, Aspen, Madison, Chattanooga, and Lansing was used to understand the opportunities and challenges associated with establishing an automated bike share system in a medium-sized community. Based on this data, it is expected that a bike share system in Fort Collins will attract approximately 1,000 annual members and 8,000 casual subscribers per year. Ridership is expected to be approximately 38,000 trips per year and the system is expected to recoup approximately 42% of its operating costs from membership and usage fees.<sup>56</sup>

A 20-station (Phase 1) system will require approximately \$1.1 million in funding for capital and installation, system start-up, and pre-launch administrative costs. Operating costs are expected to be in the order of \$2.6 million for the first five years of operations.

There are two possible funding tracks. The quickest is to secure capital through local public funding and through direct contributions from CSU and other interested organizations and businesses. Operating

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<sup>56</sup> Based on Year 2 numbers from the business pro-forma. Year 1 numbers are unreliable as they represent partial year numbers and ramp up of ridership and operations.

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funds would come from user revenues, local public funding, an increase in the ASCSU student fee, and sponsorship of any remaining stations.

The longer track involves obtaining federal or state grant money, along with local matching funds, to use towards capital. Grants can take up to two years for the money to become available, pushing the possible launch date into at least 2016. Under this scenario, operating funds would come from user revenues, CSU funding sources, and sponsorship of the bikes and stations.

System costs can be reduced by considering different vendors and technologies, e.g., “smart-bike” technology may be less expensive per bike (although these systems may increase operating costs), reducing the monthly operating costs, e.g., through making use of existing staff, services, and facilities in the City, and by placing an emphasis on annual and casual membership recruitment.

The City of Fort Collins currently prohibits advertising in the public right-of-way. Further, the City’s sign code limits what can be displayed on off-premise signage. Further follow-up with the City’s legal department is necessary to better understand these policies and to develop a course of action to allow advertising and sponsorship.

Implementation of an automated bike share system is a detailed process that will require dedicated staff to handle procurement, funding, branding and marketing, site planning and permitting, deployment, operations, and launch. Funding is likely to be the critical path with the timeliness of capital funding largely unknown and sponsorship being required and often pieced together from multiple contracts with participating organizations.

### **Next Steps**

Near-term action items include:

1. Work with potential funding and fundraising partners (e.g., CSU, Kaiser Permanente).
2. Conduct preliminary work on station siting.
3. Follow up on advertising regulations and sign code to develop a course of action to allow advertising and sponsorship on the bikes and at the stations.
4. Advocate for funding through the BFO process.
5. Integrate bike share into the 2014 Bicycle Master Plan, including policy and infrastructure recommendations, as well as ongoing outreach.
6. Monitor and pursue grant opportunities.
7. Begin scoping for a Request for Proposals (RFP).

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## **Appendix A**

### **Bike Share Technical Advisory Committee**

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**Fort Collins Bike Share Technical Advisory Committee**

Susan Beck-Ferkiss – Social Sustainability

Amy Lewin – FC Moves

Emma Belmont – Transfort

Seth Lorson – Planning Services

Megan Bolin – Economic Health

Elin Moorman – Visit Fort Collins

Stacey Clark – CanDo

Becky Moriarty – FC Bikes

Kathy Collier – ClimateWise

Nancy Nichols – Safe Routes to School

Todd Dangerfield – DDA

Katy Schneider – Visit Fort Collins

Aaron Fodge – CSU

Ashley Schwader – Poudre School District

Derek Getto – DDA

Michael Short – DBA

Tessa Greegor – FC Bikes

Paul Sizemore – FC Moves

Aaron Iverson – FC Moves

Garry Steen – Transportation Board

Mark Jackson – PDT

Nate Vander-Broek – NFRMPO

SeonAh Kendall – Economic Health