Cincinnati Bike Share Feasibility Study

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Cover photo courtesy of Michael Providenti

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1 Introduction

The City of Cincinnati is committed to increasing the role of non-automobile transportation options in the city. The City's Bicycle Transportation Plan adopted in 2010 calls for almost 300 miles of on- and off-street bikeways and a streetcar line is planned for Downtown and Over-the-Rhine with potential expansion into Uptown. Bike sharing has been suggested to the city as a means of providing an additional highly visible, affordable, and easy-to-access mobility option for both residents and visitors.

A number of successful bike share systems have been implemented in the United States. The City of Cincinnati has commissioned this study to understand the characteristics that make those systems successful and to determine if bike sharing is feasible in Cincinnati.

The objectives of this study are to:

- Introduce bike sharing in a way that can be presented to decision makers, potential partners, and key stakeholders.
- Present experience from operating bike share systems in North America to identify key system parameters and understand potential demand in Cincinnati.
- Evaluate the preparedness of Cincinnati and identify the most suitable areas for bike sharing and any obstacles that could impact success.
- Identify an initial service area and size for a potential bike share system from which to forecast expected demand, costs and revenues.
- Present different funding options and operating models and recommend those most applicable to Cincinnati.

Although the suitability of the entire city has been considered, this report focuses on the most densely populated and mixed use environments in Downtown, Over-the-Rhine (OTR), and Uptown. These areas are most likely to have initial success and encourage expansion of the system into lower demand areas.

This report is organized as follows:

- Section 1 provides an introduction to bike sharing and the historical development of bike sharing technology.
- Section 2 summarizes some of the benefits being realized by other cities that operate bike share systems.
- Section 3 identifies potential market segments and user characteristics.
- Section 4 explores ownership and operating models that may be appropriate in Cincinnati.
- Section 5 presents a local context analysis that assesses the 'preparedness' of Cincinnati in a number of key areas thought to influence the success of bike sharing, such as land use and density, visitor

attractions, transit, and a supportive bicycling infrastructure and policy environment. A summary of the opportunities and challenges is included at the end of the section.

- Section 6 presents a preliminary system plan including an initial coverage area, system size, proposed station locations, and potential expansion of the program.
- Section 7 explores financial considerations including the expected cost of the system, potential funding sources, and expected user demands and revenues.
- Section 8 wraps up the report with a summary of the findings and a series of recommendations for moving forward.

1.1 What is Bike Sharing?

Bike sharing provides a cost-effective and elegant mobility option for trips too far to walk, but not long enough to take transit or drive. A bike share system consists of a network of stations placed throughout a city from where a bike can be taken from a station and returned to any other station. It is a relatively inexpensive and quick implementation extension to a city's public transportation offerings.

Over 300 cities worldwide including Denver, Boston, Miami, Chattanooga, Washington D.C., and Minneapolis in the United States, are investing in bike sharing (see Figure 1).

Figure 1 - Bike Share Systems of North America

1.2 Development of Bike Share Technology

The international community has experimented with bike share programs for nearly 40 years. Figure 2 tracks the historic development of bike share systems. Until recently, these programs experienced low to moderate success because of theft and vandalism. In the last five to ten years, innovations in technology to increase accountability, such as credit card transactions and RFID chips (radio frequency identification) have given rise to a new generation of technology-driven bike share programs.

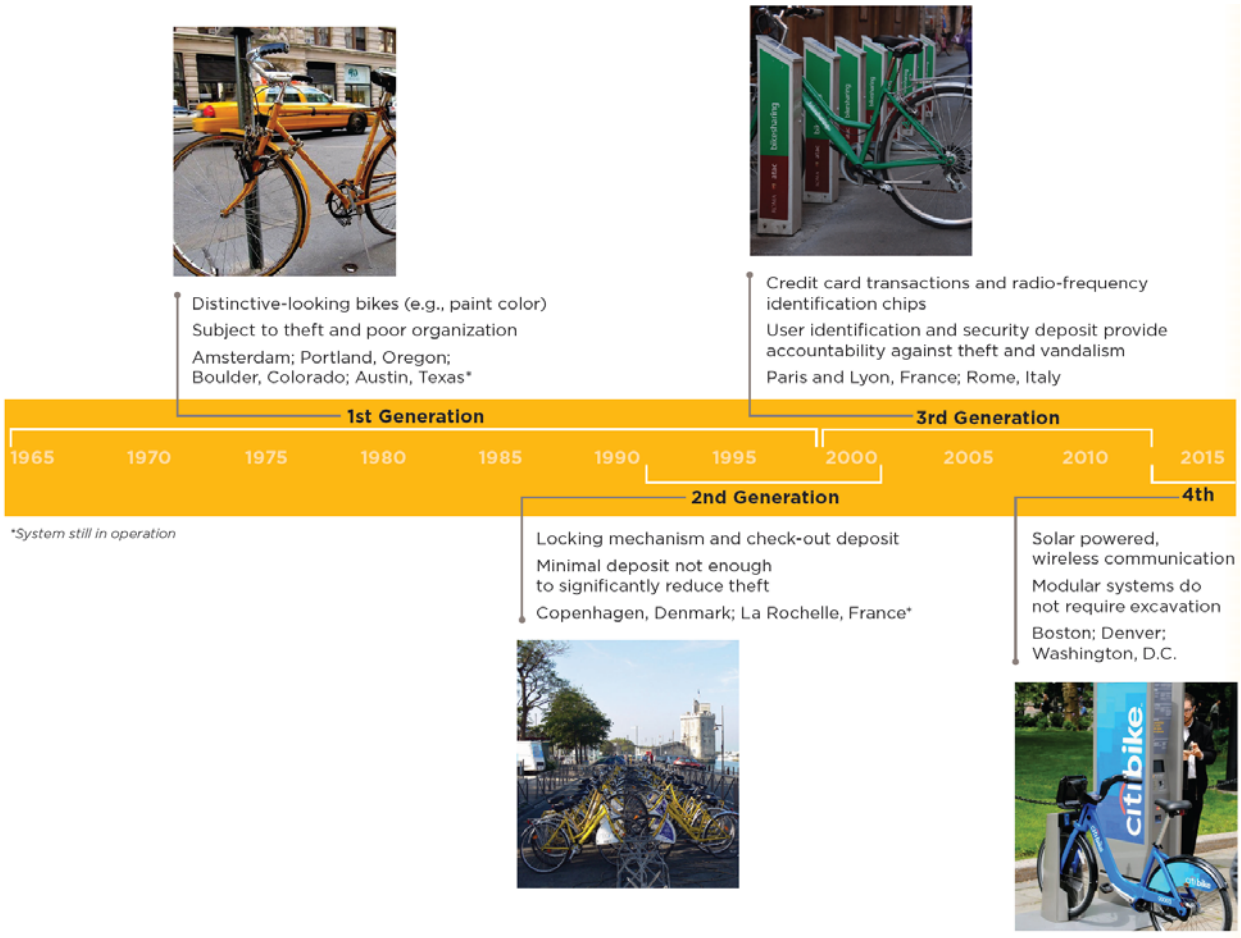

Figure 2 - Historic Development of Bike Sharing Technology

The most recent, "fourth generation" technology, includes modular stations that use solar power and wireless communications, as opposed to requiring hardwired installation. In this way, stations can be moved, relocated, expanded, or reduced to meet demand.

The components of a modern bike share system are described in Figure 3. The bikes are typically upright bicycles, which have the advantage of being "one-size-fits-all" and encourage movement at a slower pace. They typically include safety features such as puncture-resistant tires, reflectors and reflective tires, a bell, and a light that is powered by pedaling the bicycle.

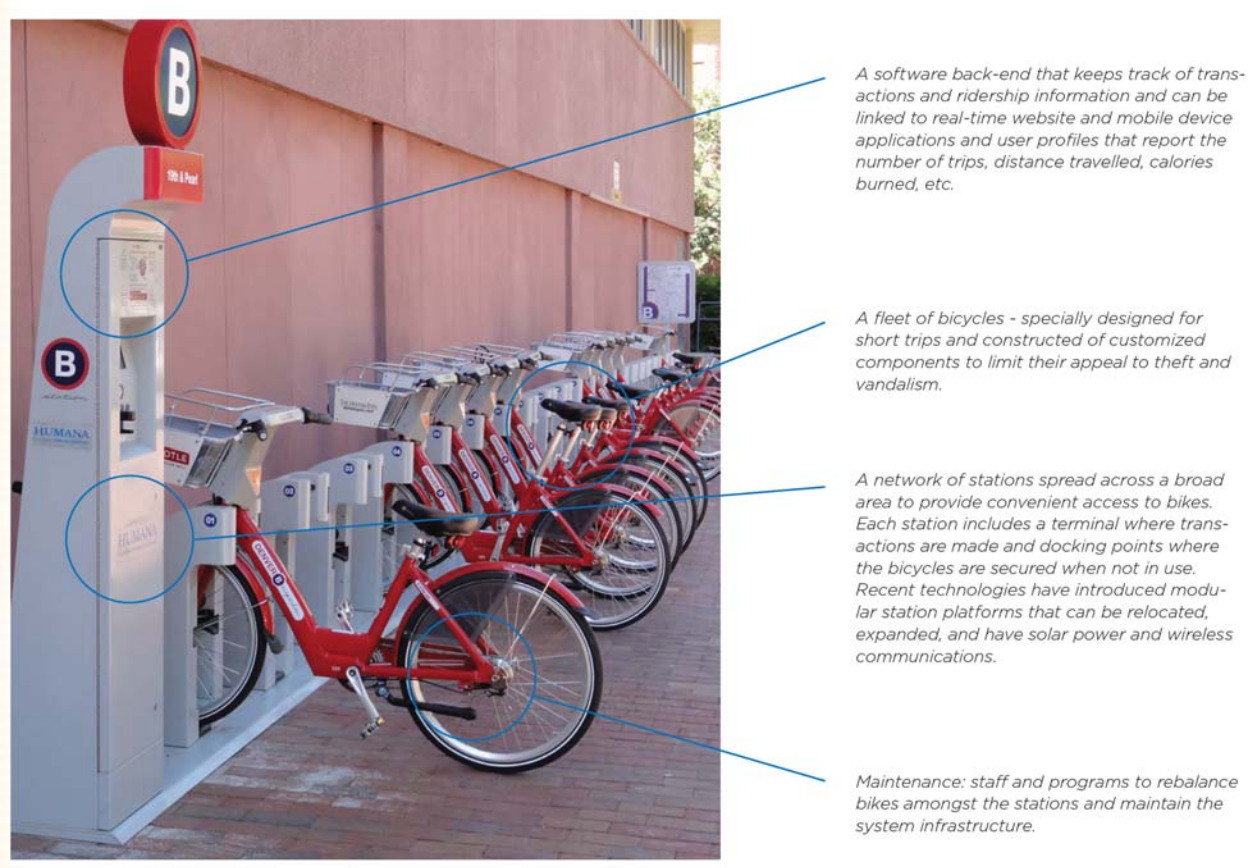

Figure 3 - Elements of a 4th Generation Bike Share System

2 Benefits of Bike Sharing

Other cities have found bike sharing transformative. Relative to its cost, bike sharing brings numerous benefits. This section provides a summary of some of the financial, health, environmental, and transportation / mobility benefits that support bike sharing.

2.1 Financial Benefits

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

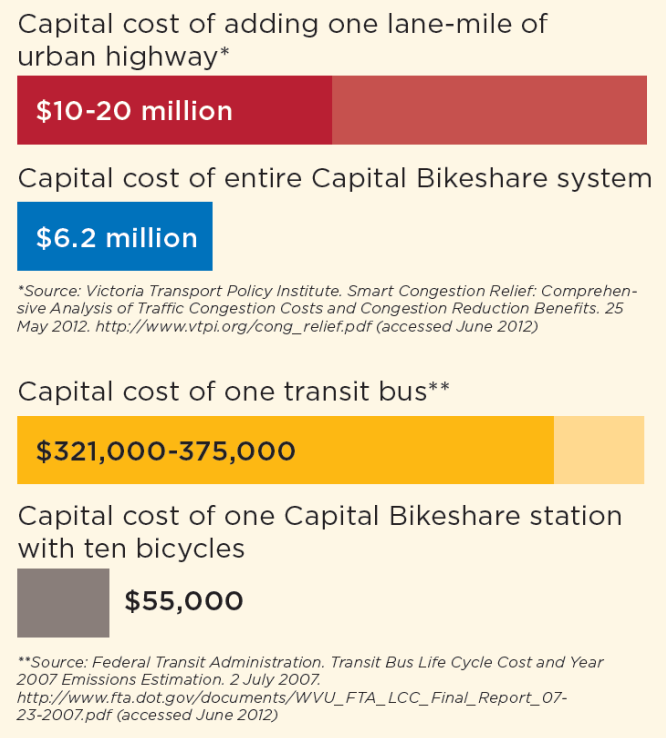

Figure 4 – Relative costs of transportation investments

Unlike other transportation modes, North American cities have generally used little to no local public funding for the ongoing operation of their bike share systems, rather relying on a combination of user revenues and private sponsorship. Other US cities have reported "farebox recoveries" (i.e. the percentage of operating cost recovered by user revenues) ranging from 36% (Boulder) to 97% (Capital Bikeshare[1]). This is compared to traditional rail and bus transit systems in the U.S. that operate with farebox recoveries around 35 percent (Metro). Full farebox recovery may or may not be possible in Cincinnati.

[1] Pedestrian and Bicycle Information Center. (2010). Economic Benefits: Money Facts. Retrieved 1/20/2010 from www.bicyclinginfo.org/why/benefits_economic.cfm

Bike share systems are also:

- High-profile additions to a city that in themselves become an attraction for visitors and tourists and generate positive national and international media exposure that would otherwise be difficult or costly to generate.
- Create "green" jobs with on-going positions for managing and operating the system. The size of system being considered in Cincinnati (approximately 35 stations) could generate around 8 full-time jobs.
- Provide existing businesses an additional way to get customers to their front door or to provide employees with an inexpensive transportation option for commuting to work and running errands during the day (bike sharing could form part of a business' Travel Demand Management toolbox).
- Provide businesses of all sizes an opportunity for brand development through station / bike sponsorship. Bike sharing also represents a positive "community amenity" contribution for many companies and property developers.
- Household budgets can benefit from bike sharing by reducing transportation costs. In some cases, bike sharing can eliminate the need for an extra vehicle.
- The wireless and modular nature of stations provides a number of benefits over other transportation infrastructure. The system can be installed quickly and inexpensively and stations can be expanded, reduced, or moved to optimize demands.

Transportation is second to housing as a percentage of household expenditure and often the largest expense amongst low income families. According to the Bureau of Labor Statistics Consumer Expenditure report, residents in the Midwestern U.S. spent an estimated 16 percent of their household budget on transportation (2009-2010 fiscal year). Bicycling, and in particular bike sharing, is an affordable form of transportation. The cost of using a bike share bicycle for a year can be as low as the annual membership fee, typically between $70 and $100 per year, compared to $8,000 to $9,000 to operate a car over the same time period.[2] Bicycling will likely become an even more attractive transportation option as gas prices continue to rise.[3]

[2] Pedestrian and Bicycle Information Center. (2010). *Economic Benefits: Money Facts*. Retrieved 1/20/2010 from www.bicyclinginfo.org/why/benefits_economic.cfm

[3] King, Neil. (2/27/08). The Wall Street Journal: Another Peek at the Plateau

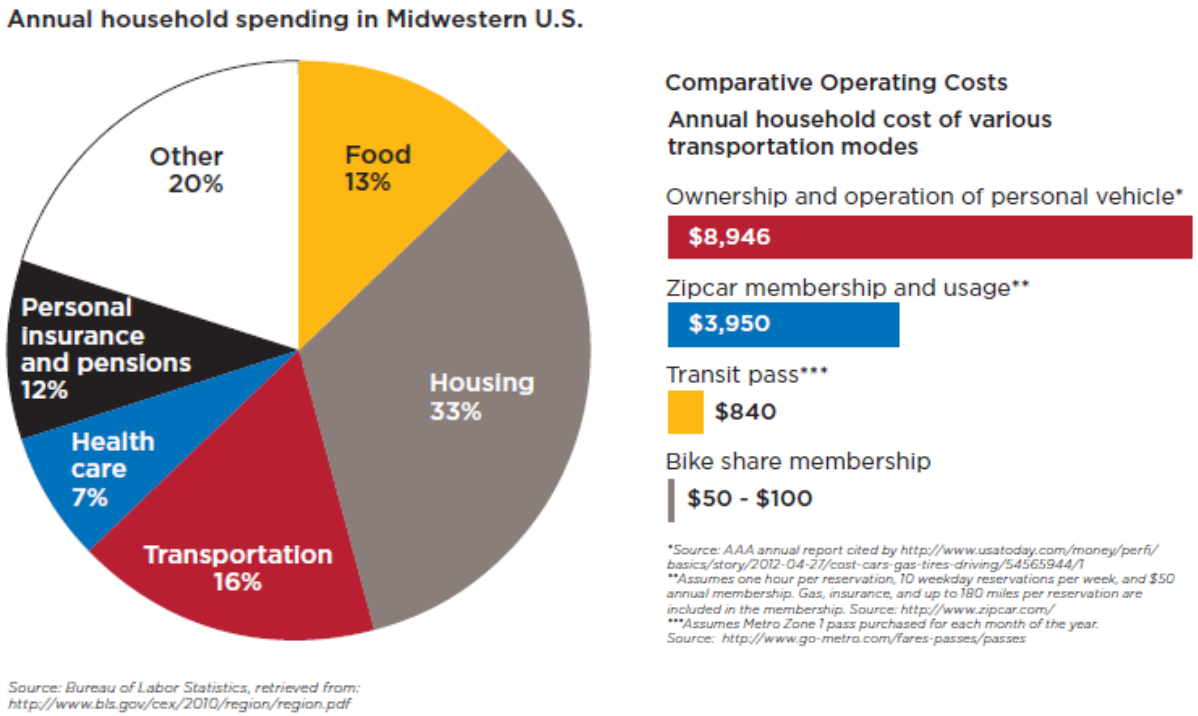

Figure 5 – Household spending on transportation in the Midwest and the relative cost of different transportation modes.

2.2 Health Benefits

The health benefits of bicycling are well-recognized. An accessible, low-impact form of physical activity, bicycling has the potential to reduce obesity, heart disease, and other sedentary lifestyle diseases. Approximately 65% of adult Cincinnatians are overweight or obese according to a recent community health assessment by Xavier University[4]. Additionally, only 50% of adult Cincinnati residents met recommended guidelines for physical activity in 2010, down from 55% in 2005.

Organizations in greater Cincinnati are increasingly aware of this public health challenge, and acknowledge that bicycling has a role to play in combating obesity and physical inactivity. Hamilton County is one of a select number of communities nationwide participating in Communities Putting Prevention to Work (CPPW), an initiative funded by the Centers for Disease Control to help prevent community obesity[5]. Go Vibrant is a local non-profit with the goal of making Cincinnati one of the 10 healthiest cities in the country in the next decade[6]. The organization promotes healthy events and activities around Cincinnati, including bicycling events in partnership with Queen City Bike.

[4] http://www.xavier.edu/community-health/Obesity.cfm

[5] http://www.cdc.gov/CommunitiesPuttingPreventiontoWork/communities/profiles/obesity-oh_hamilton-county.htm

[6] http://www.govibrant.org/

The synergies between bicycling and health have attracted considerable interest in other cities where health care providers are major sponsors of bike sharing systems in Minneapolis (Blue Cross and Blue Shield of Minnesota) and Denver (Kaiser Permanente). This potential also exists in Cincinnati with the number of medical institutions, especially in Uptown.

2.3 Environmental Benefits

Bike sharing is practically carbon neutral. The stations are solar powered and environmentally friendly facilities and equipment can be chosen for operations (such as cargo bikes or electric vehicles for bicycle redistribution). North American cities with bike sharing report that approximately 25 percent of trips replace a vehicle trip, reducing emissions, fuel use, and the need for hard space taken up by automobile parking.

In 2010 Cincinnati received an "F" grade for air quality and has been allocated CMAQ funds that will be used towards the streetcar project. Bike share can integrate with streetcar (and other transit) to increase its reach and provide a last mile option.[7]

2.4 Transportation / Mobility Benefits

Bike sharing provides an additional mobility option for short urban trips for residents and visitors. Figure 6 illustrates how bike sharing fills an existing gap between trips too long to walk, but not long enough to justify waiting for transit or the cost of driving or catching a taxi. Bike sharing can also:

- Reduce reliance on the private automobile. Initial experience in North American cities has shown that approximately 25 percent of bike share trips replace a vehicle trip.
- Extend the reach of transit by providing a first- and last-mile transportation solution or providing service to currently under-served areas.
- Introduce people to cycling and encourage more bicycling. In Paris, for example, consumers bought more than 2 million bicycles since the city launched its Velib bike share program[8]. Approximately 66 percent of surveyed users in Minneapolis (2010) and 82 percent in Washington DC (2011) stated that they bicycle more since subscribing to bike share.
- Reduce barriers to cycling such as the need to own and store a bike or the concern of theft at the end of a trip.

[7] http://www.wcpo.com/dpp/news/local_news/Cincinnati-Air-Quality-Flunks-Again

[8] http://www.ecf.com/4575_1

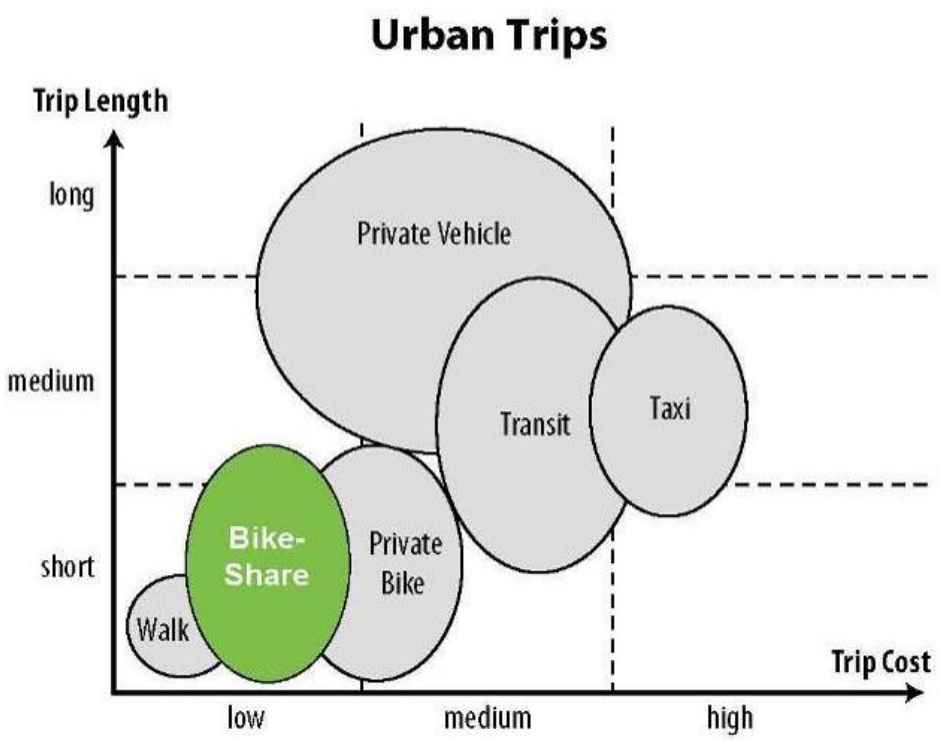

Figure 6 – Urban Transportation Spectrum

2.5 Safety Benefits

Bike share systems have to date observed a solid safety record. In North American systems, few serious injuries and no fatalities have been reported, and in Washington DC a total of 14 crashes were reported in the first year of operation, of which only one was serious in nature. Approximately one million trips were made during this same period – an injury crash rate of 0.83 injuries per million miles (the average trip length was approximately 1.2 miles per trip), which is lower than the injury rate of 7.3 injuries per million miles ridden for private bicycling.[9]

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

- The "safety in numbers" effect and increased driver awareness due to increased media, increased numbers of cyclists on the street, and because many drivers now use the bike share system or own a bicycle. Many cities have seen an increase in bicycling associated with a reduction in bicycle crash rates, as shown on Figure 7.
- The safe design of the bicycle as a visible, slow-speed, upright bicycle fitted with internal safety features such as lights and bells. Further, the bikes are regularly inspected to ensure that all safety features are in proper working order.

[9] http://bicycleuniverse.info/transpo/almanac-safety.html

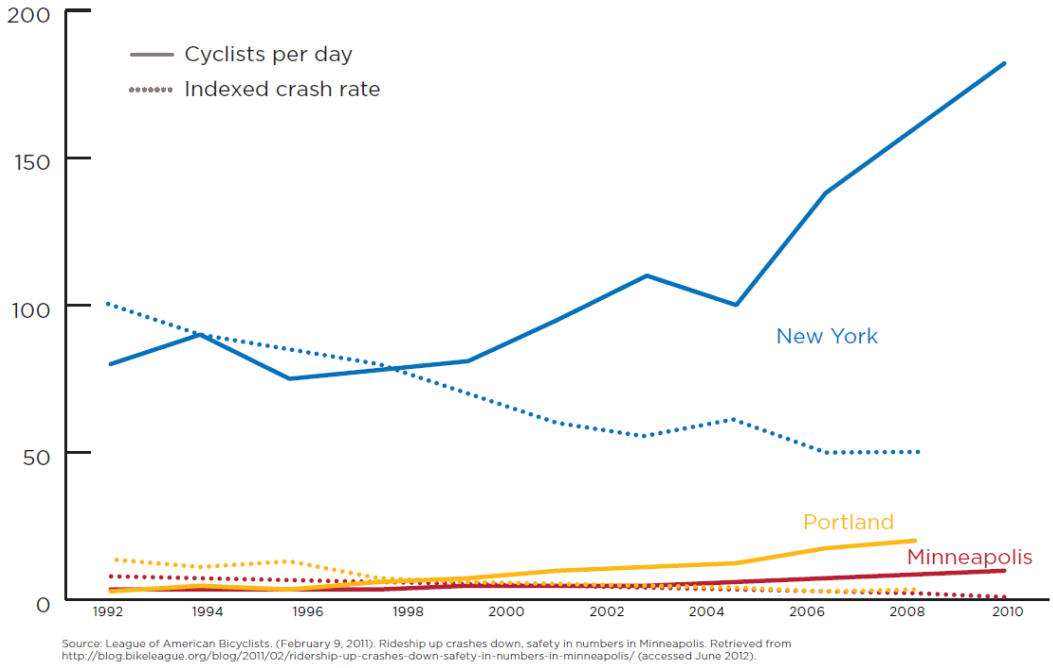

Figure 7 – Safety Benefits

2.6 Insurance and Liability

The contractor obtains an insurance policy that covers almost all liability (e.g. general liability, workers compensation, auto, etc.) except theft and vandalism of the bikes, which is covered by a replacement fund (note: insurance can be obtained for coverage of bikes while they are in stations or in storage). The contractor typically indemnifies related agencies, private property owners who host a station, and other stakeholders. Although this has not yet been mandated by cities, insurance that protects against force majeure is strongly recommended.

3 Expected Users

Cities interested in bike share systems now have the opportunity to learn from a number of established North American programs. The technology of modern bike share systems allows for automatic collection of trip data and many systems have followed up with surveys of their membership to understand more detailed travel and user characteristics. Key statistics are summarized in Figure 8 and show that:

- **Bike share trips are relatively short.** The average trip length in Hubway (Boston) and Captial Bikeshare (Washington D.C.) is just over a mile. Denver B-cycle trips are longer at approximately two miles.

- **Annual members make shorter trips than casual users.** Most North American bike share systems have price structures designed to encourage short trips and typically include a free-ride period of 30 to 45 minutes. As indicated in Table 1, annual members tend to keep their trips short and within the free-ride period, whereas casual members, including visitors, are usually willing to take longer trips and pay the associated overage fees.

- **Usage on a per bike basis varies.** The number of trips per bike is indicative of overall system use and also impacts revenue. As expected, the larger and more densely populated cities experience more usage on a per bike basis. However, usage also tends to increase as the system matures and more people have the opportunity to try bike sharing.

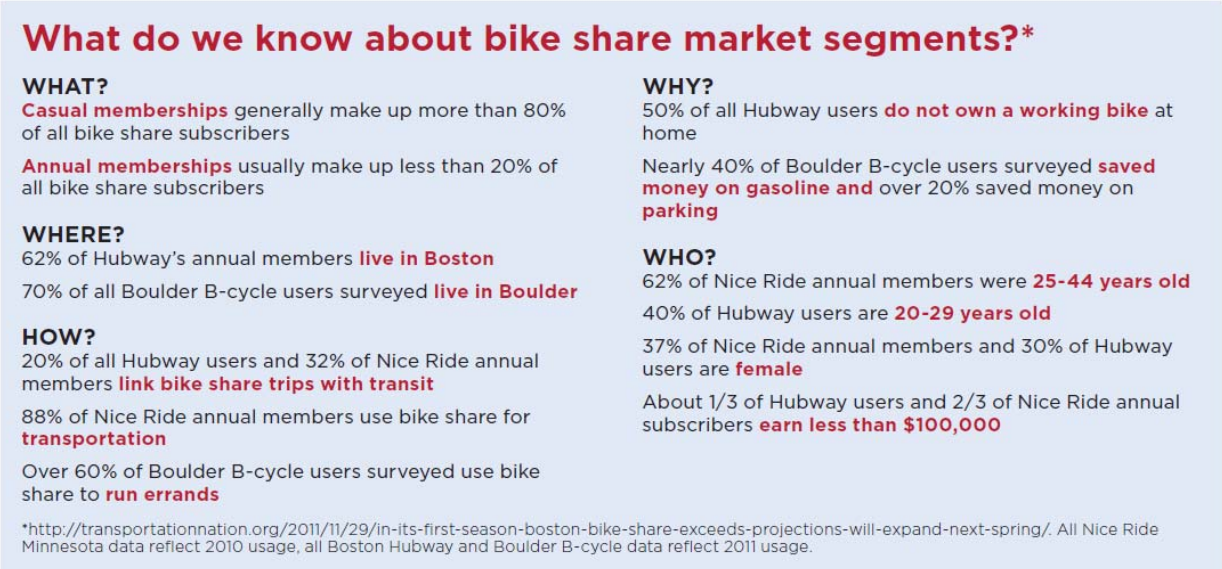

Figure 8 – Market Segments by the Numbers

Table 1 - Trip Characteristics of Sample Bike Share Systems

System	Average Trip Distance	Average Trip Duration	Trips/Bike/Day	Most Popular Station
Boulder B-cycle	-	<30 minutes	0.62	15th & Pearl Street (Downtown parking garage)
Hubway[10]	1.13 miles	70 minutes (casual user) / 17 minutes (annual member)[11]	1.95	Boston Public Library
Capital Bikeshare	1.33 miles	44 minutes (casual user)/20 minutes (annual member)	2.67	Dupont Circle
Denver B-cycle	2.05 miles	-	1.44	16th & Market Street

Source: http://transportationnation.org/2011/11/29/in-its-first-season-boston-bike-share-exceeds-projections-will-expand-next-spring/

In Cincinnati, bike sharing would provide an additional mobility option for:

- Local residents in the area covered by the bike share program (the "service area"), including to get to work, connect to transit, or to reach recreational / entertainment destinations. As a future phase of the system, this could include stations in Covington and Newport.
- Employees and commuters travelling to the service area via transit or other transportation. The system can:
    - Offer a "last mile" option to/from transit hubs, parking garages, and future Streetcar stops.
    - Allow users to run errands throughout the day such as going to meetings, lunch, appointments, personal business, etc.
- Students, faculty, and staff of the many college and higher learning campuses, in particular the University of Cincinnati campus in Uptown. These populations are typically young, well educated, and environmentally conscious and are often "early adopters" of the system.
- Staff of large Downtown employers as well as the many hospitals and medical campuses located in Uptown.
- Connecting visitors from their hotels to local destinations including tourist attractions, entertainment districts, convention and meeting facilities, and restaurants.
- Short recreational trips, e.g. along the Ohio River Trail.

[10]Source: http://transportationnation.org/2011/11/29/in-its-first-season-boston-bike-share-exceeds-projections-will-expand-next-spring/

[11] Source: Moskowitz, Eric. (November 28, 2011). Boston.com *Hubway to branch out next spring*. Retrieved from http://www.ct.gov/dep/lib/dep/p2/business_industry/hospitality/hubway_to_branch_out_next_spring.pdf (accessed June 2012)

4 Ownership and Operation

Many cities in North America are investing in bike share systems for the reasons outlined previously. Their success has dramatically increased the visibility of bicycling and increased activity and investment in bicycling.

Montreal was the first North American city to significantly invest in bike sharing and led the development of fourth-generation technology. Following the lead of Montreal numerous North American cities have since launched bike share programs, which has seen the introduction of new vendors and the creation of several innovative business models, which continue to develop.

Each system has identified a governance and organizational structure that fits the needs of the local market, the municipal and/or regional procurement offices, and the funding environment. A summary of North American bike share business models is included in Table 2.

Table 2 - Bike Share Operating Models in North America

Name	Stations / Bikes	Operations	Ownership of Capital Infrastructure
Boston New Balance Hubway	61 / 610	Public – private partnership; operator direct contract with the City of Boston, other municipalities to contract directly with operator (RFP issued by regional planning agency).	City of Boston (government agency)
Capital Bikeshare	179 / 1,560	Operator direct contract with both Washington DC and Arlington County.	DDOT and Arlington County (government agencies)
Capital Bixi (Ottawa / Gatineau)	10 / 100	NCC funding of $785,000 for equipment and launch. Operated by PBSC.	National Capital Commission (government agency)
Chattanooga Bike Share (2012 launch)	30 / 300	Public – private partnership; operator direct contract with local transit agency (which received federal funding).	Outdoor Chattanooga (government agency)
Chicago B-Cycle	6 / 100	Completely private system, privately owned and operated, concession agreement only.	Bike N Roll (private company)
Denver B-Cycle	50 / 500	Non-profit set up by city.	Denver Bike Sharing (non-profit)
Des Moines B-Cycle	4 / 18	Already existing local non-profit (Des Moines Bicycle Collective).	Des Moines Bicycle Collective (non-profit)
Ecobici, Mexico City	85 / 1,000	Private advertising-funded system.	Clear Channel Communications (private company)
Miami Beach DecoBike	100 / 1,000	Completely private system, privately owned and operated, concession agreement only.	DecoBike (private company)
Montreal	405 / 5,050	Owned and operated by Public Bike System Company (PBSC), a non-profit organization.	PBSC (non-profit)
New York City Bike Share (planned)	600 / 10,000	Completely private system; privately owned and operated.	Alta Bicycle Share (private company)
Nice Ride Minnesota	116 / 1,200	Non-profit set up by city.	Nice Ride Minnesota (non-profit)

Name	Stations / Bikes	Operations	Ownership of Capital Infrastructure
San Antonio B-Cycle	14 / 140	Governed by non-profit set up by city – operated by bike rental company through tender.	San Antonio B-Cycle (non-profit)
Toronto Bixi	80 / 1,000	Program owned and operated by PBSC. City of Toronto provided a $4.8 million loan guarantee.	PBSC (non-profit)

Based on Table 2 and other examples globally, the core business models include:

- Operating non-profit (either pre-existing or established specifically) owns and operates the system.
- Administrative non-profit (either pre-existing or established specifically) owns and administers the system; operated by a private contractor.
- Privately owned and operated.
- Publicly owned; operated by a private contractor.
- Publicly owned and operated (no North American examples).
- Owned and operated as part of a street-furniture advertising contract.
- Transit agency owned and operated (no North American examples).

The decision for the appropriate model needs to consider: ownership of assets, transparency for agency and the public, share of profit and risk, operating expertise, fundraising ability, expansion potential and contracting (especially inter-jurisdictional expansion), and staff capacity / organizational interest. The advantages and disadvantages of each model are summarized in Table 3.

As shown in Table 3, it is recommended that the following models be explored further:

- Publically Owned / Privately Operated: dependent on the responsible agency, likely the City of Cincinnati (and other cities for future expansion) being interested in taking an administrative role and establishing a staff position for this role. This decision should be made before issuing an RFP as it has the greatest effect on a vendor's response to proposal.
- Administrative Non-Profit: the non-profit model provides a number of benefits over other models including fundraising flexibility and a public-oriented mission towards providing bike sharing services. This model has the benefit over an operating non-profit of using private sector experience for launch and operations.
- Privately Owned and Operated: this model has the least requirement for staff and agency responsibility and the benefit of turning over full risk to the private sector. However, it provides less control and flexibility to public agencies and is dependent on the private sector being able to raise the necessary funds for the system.

Table 3 - Advantages and Disadvantages of Typical Bike Share Operating Models

Model	Ownership of Assets	Transparency	Risk / Profit Share	Operating Expertise	Findraising Ability	Expansion Potential	Staff Capacity / Interest	Recommendation
Operating non-profit	Non-profit	Some transparency through representation on Executive Committee	Risk is taken on by non-profit. Non-profit reinvests profits back into growth of the system.	Non-profit lacks start-up and operating expertise, which can affect level of service.	Non-profit brings ability to raise funds from public and private sources.	Non-profit provides a central organization that other cities can contract with directly.	Staff dedicated specifically to the mission of bike sharing.	**Not Recommended:** launch and operations will be impacted by the lack of expertise in these areas, which could affect customer experience.
Administrative non-profit	Non-profit	Some transparency through representation on Executive Committee	Risk is taken on by non-profit. Non-profit reinvests profits back into growth of the system.	Makes use of private expertise to compliment non-profit mission.	Non-profit brings ability to raise funds from public and private sources.	Non-profit provides a central organization that other cities can contract with directly.	Staff dedicated specifically to the mission of bike sharing.	**Pursue Further:** non-profit administration brings a number of benefits in fundraising and public perception. This model also brings the expertise and skills of the private sector for operations.
Privately owned and operated	Private	Little control over operations – responsibility turned over to the operator	Risk (and profit) is entirely taken on by private sector. Profits not necessarily reinvested	Makes full use of private sector experience, often tried in other cities.	Private entity can be well connected with sponsors or has trouble attracting private sector sponsorship.	Private organization provides a central organization that other cities can contract with directly.	Makes full use of private sector experience, often tried in other cities.	**Pursue Further:** this model is highly dependent on an operator believing that they can maintain financial sustainability. This is a decision that is typically made at an RFP stage.
Public / Private Partnership	Private; public agency brings in-kind services, right-of-way, etc.	Agency maintains some control as a non-funding partner in the project.	Financial risk taken on by private sector; profits shared by agreement	Makes full use of private sector experience, often tried in other cities.	Public sector brings additional clout and ability to secure funding.	Cities would need to enter into agreements with each other to establish common operating parameters, profit share, etc. However, each city could contract directly with the operator.	Makes full use of private sector experience, often tried in other cities. Minimizes agency staff needs.	**Unlikely:** there is likely to be little interest from private operators to take on the financial risk of the system without full control of the system.
Publically owned – privately operated	Public agency	Large control. Agency sets the parameters and pays an operator a set fee.	Risk is taken entirely by public agency, typically higher level of scrutiny than other models.	Makes use of private expertise to compliment agency skills.	Has ability to leverage public and private dollars, but requires staff capacity and skills	Cities would need to enter into agreements with each other to establish common operating parameters, profit share, etc. However, each city could contract directly with the operator.	Requires agency staff capacity for administration, but makes use of private operator dedicated to bike share.	**Pursue Further:** model is dependent on agency commitment to provide a staff member to oversee and administer the system, but maintains agency transparency whilst utilizing private sector expertise.
Publically owned and operated	Public agency	Full control. Agency sets the parameters and operates the system.	Risk is taken entirely by public agency, typically higher level of scrutiny than other models.	Agency lacks start-up and operating expertise, which can affect level of service.	Has ability to leverage public and private dollars, but requires staff capacity and skills	Cities would need to enter into agreements with each other to establish common operating parameters, profit share, etc.	Requires agency staff capacity for both administration and operations.	**Not Recommended:** there is insufficient staff capacity, funding, or interest from local agencies to take on full responsibility for operating the system.
Advertising contract	Private	Little control over operations – responsibility turned over to the operator	Risk is taken entirely by private entity. User revenues can be retained privately or allocated back to public agency	Advertising company often has experience in other cities, however bike sharing is not their central mission.	Funding already secured, but at the expense of existing street advertising revenues or requires additional street advertising.	Cities would need to be comfortable with the same operating model and be willing to enter into agreements with the same advertising contractor, which may or may not be consistent with their existing contracts.	Bike sharing not the central mission of the organization, which can affect level of service.	**Not Recommended:** this model requires agencies to create more street space advertising or to give up some level of existing street furniture advertising revenue. Bike share is not central to these organizations, which can affect service levels.

5 Local Context Analysis

This section reviews factors considered to be important to the success of bike sharing. Where possible, comparisons have been made to other U.S. cities that have operating bike share systems. Under-performance in any one of these areas does not exclude the feasibility of a bike share system but each factor influences the potential success of the system. A summary of the preparedness of Cincinnati for bike sharing is included at the end of the section.

5.1 Demographics

5.1.1 Population and Population Density

The city-wide population and population density of Cincinnati is compared to several US cities operating bike share systems in Table 4 and is summarized as follows:

- Population: the City of Cincinnati has a population of approximately 300,000 people and a regional population of over 2 million people (2008)[12]. This is similar in scale to Minneapolis that has an operating bike share system.
- Population Density: city-wide population density is approximately 3,800 persons per square mile. This is on the lower end of densities seen in other North American bike share cities, but compares with the city-wide density of Denver, CO.
- Downtown Population: based on the 2011 *State of Downtown* report (see Figure 9), the population living in Downtown, OTR, and Pendleton (generally the service area for an initial bike share system) is approximately 13,000 people and has increased each year since 2007. At 1.5 square miles, this area has a density of approximately 8,700 people per square mile.

Table 4 – Comparison of Cincinnati Population and Density with other Cities that have Invested in Bike Share

City	Population	Land Area (Sq. Mi.)	Density (Persons/Sq. Mi.)
Boston, MA	620,000	48	13,000
Washington, DC	605,000	61	10,000
Downtown, OTR and Pendleton	**13,000**	**1.5**	**8,700**
Minneapolis, MN	385,000	54	7,000
Denver, CO	605,000	153	4,000
Cincinnati	**300,000**	**78**	**3,800**
Chattanooga, TN	170,000	137	1,200

Source: ACS 2010 1-Year Estimates, B1003; Census QuickFacts (http://quickfacts.census.gov).

[12] Ohio – Kentucky – Indiana Regional Council of Governments *Annual Population Estimates (2000 – 2008)*.

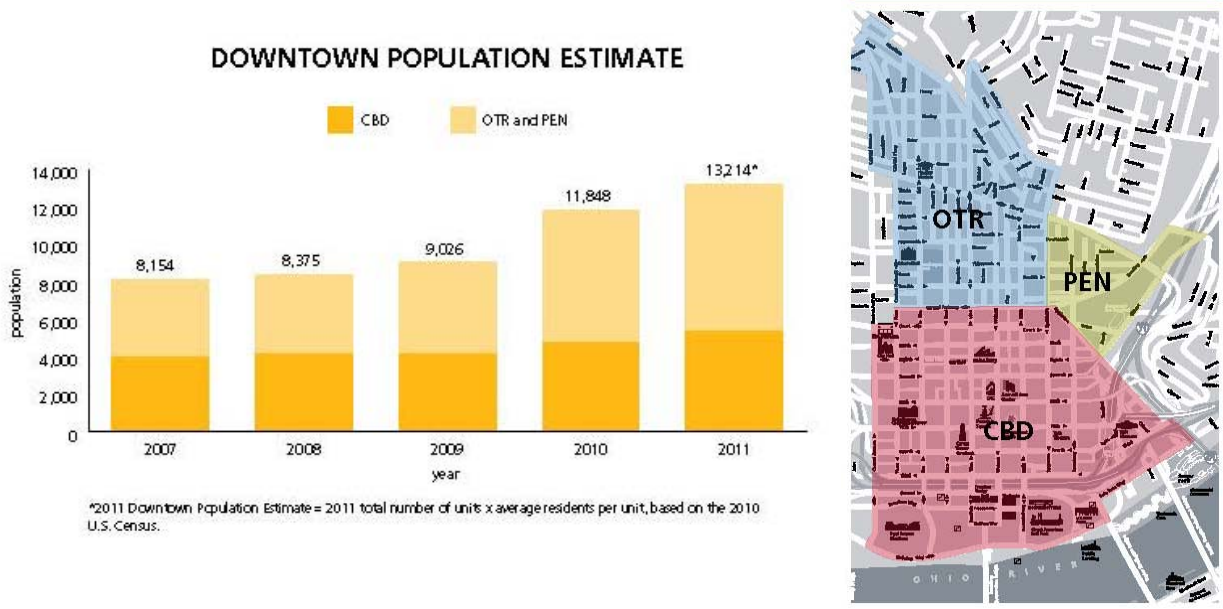

Figure 9 – Downtown and OTR Population Growth (2007 to 2011)
2011 State of Downtown Report

5.1.2 Age and Income

Other cities have found that 'early adopters' include young, urban professionals (e.g. the 25-34 year old age group and household incomes over $100,000 are the highest represented groups in other systems), although it is uncertain whether this is merely a result of the fact that these populations are over-represented in areas where bike share systems have been launched. Regardless, there is an opportunity in Cincinnati to tap into these populations – particular in OTR and Uptown.

Young, urban populations are also easy and inexpensive to market to responding strongly to word of mouth and social media and nearly one in eight Cincinnati residents (12.4%) is enrolled in undergraduate or graduate school (American Community Survey) – comparable to Washington DC (12.6%) and Minneapolis (14.8%).

OTR has recently seen significant redevelopment of much of its housing stock and an increase in retail and entertainment options, particularly along Vine Street, Walnut Street, and Main Street. This has attracted a population of young, urban professionals to move to the area.

The University of Cincinnati (UC) has a significant presence in Uptown, with an enrollment of approximately 31,000 full time and 12,000 part time students. The university also brings associated housing and supports nearby retail and commercial districts such as Calhoun / McMillan, Ludlow Avenue, and Short Vine. The UC campus would be an important part of any bike share system in Uptown.

5.1.3 Employment

There are a number of large employers, particularly in Downtown and Uptown that will provide a user base for an initial bike share system in Cincinnati. The City is the headquarters of ten Fortune 1000 companies and seven Fortune 500 companies (2011 State of Downtown Report) as well as a number of over 5,000 employee companies and institutions.

Approximately 55,000 people work in Downtown Cincinnati, which has an inventory of over 18 million square feet of office space. In 2011, a number of large companies relocated, renewed, or expanded their commitment to Downtown. The Uptown area has a number of significant employment nodes as well, which include the University of Cincinnati and the various medical campuses. A list of the top 10 employers in Cincinnati is included in Table 5.

Table 5 – Largest Employers in Cincinnati (2010)[13]

Employer	#of Employees	Industry
Kroger Co	17,000	National grocery retailer
University of Cincinnati	15,000	Public university
The Procter & Gamble Company	14,000	Consumer products company
Cincinnati Children's Hospital Medical Center	12,000	Pediatric medical center
TriHealth Inc.	10,000	Health care system
Mercy Health Partners	8,500	Health care system
Archdiocese of Cincinnati	8,000	Religious education
GE Aviation	7,500	Jet engine / components
Wal-Mart Stores	7,000	National retail chain
St. Elizabeth Healthcare	7,000	Health care system

5.1.4 Visitor Numbers

While Cincinnati is not a major tourist destination like some other cites with bike share systems, it is home to several major tourist and visitor destinations. According to the Cincinnati Convention & Visitors Bureau, 250,000 conference attendees visited the city in 2011, including events at the recently expanded Duke Energy Convention Center. The Cincinnati Bengals and Cincinnati Reds major league sports teams attract thousands of visitors annually.

Bike sharing can provide a connection between attractions and to major Downtown hotels. Visitors can cover more distance on a bike allowing them to explore more of the city than they would be able to by walking.

5.2 Bicycle Infrastructure

The existing bikeway network is shown in Figure 10. The City of Cincinnati has shown an increasing commitment towards bicycling in recent years. In 2010, the city adopted its current Bicycle Master Plan, which updated the previous 1976 plan. The current plan calls for almost 300 miles of on- and off-street bikeways to be installed between 2010 and 2025.[14] A comparison of existing and recommended bikeway mileage totals based on the Bicycle Transportation Plan is included in Table 6.

[13] Southwest Ohio Regional Transit Authority (2010), *Comprehensive Annual Financial Report.* http://www.go-metro.com/uploads/pdfs/CAFR%202010.pdf

[14] http://www.cincinnati-oh.gov/bikes/progress.html

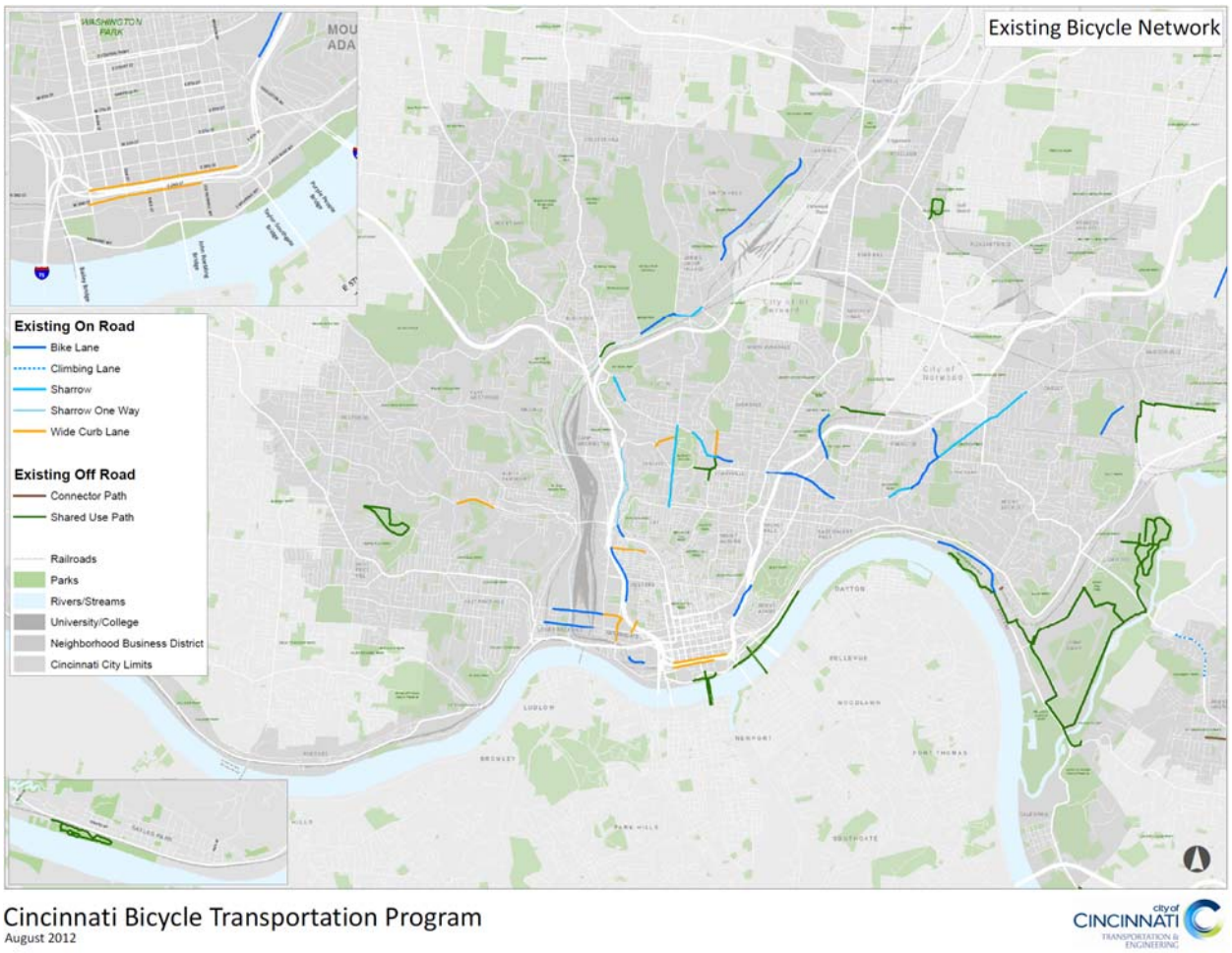

Figure 10 – Existing Bicycle Network in Cincinnati

Table 6 – Existing and Planned Bicycle Facilites (City-wide)

Bicycle Facilities	Existing (miles)	Total Planned (miles)
On-Street Bike Lanes	9.7	113.9
Shared Lane Markings (Sharrows)	5.2	105.3
Shared Use Paths (bicycle and pedestrian trails)	20.9	64.8
Cycle Tracks	0	5.9
Total	**35.8**	**289.9**

The City issues a "Biking Report Card", which in 2011 and based on the response of surveyed cyclists, gave the city a "C" grade for biking but did recognize the city's increased efforts and progress with a "B+" grade in that category.[15] The League of American Bicyclists has also taken note of the city's efforts, giving Cincinnati a Bronze-Level award for its commitment to bike infrastructure and advocacy.[16]

In terms of the proposed initial bike share launch area, bicycling in Downtown is generally comfortable, despite a lack of dedicated bicycle facilities, due to the well connected grid network of streets that provides a variety of route options and generally slower traffic speeds (controlled by signal timing). Notable bike facilities include segments of the Ohio River Trail as well as shared use paths across the Purple People Bridge and John Roebling Bridge. A few streets are marked with bike lanes including Gilbert Avenue, Winchell Avenue, Linn Street, and W 8th Street. Several other streets, including Central Parkway, are designated bicycle routes, but do not have dedicated lanes or other provisions for cyclists.

In Uptown, streets are generally wider and busier and less comfortable for cyclists. There are a number of routes that could provide comfortable options to connect a network of stations, but overall the lack of dedicated facilities may have an impact on the uptake of a bike share program in Uptown. In terms of bicycle facilities, there are shared lane markings (sharrows) on Clifton Avenue between Ludlow Avenue and Calhoun Street (adjacent to the University of Cincinnati), and on Jefferson Avenue between Ludlow Avenue and Vine Street. There is also a shared use path on segments of Martin Luther King Drive and Jefferson Avenue, connecting the east and west campuses of the University of Cincinnati.

The "cycling culture" in Cincinnati is still adapting. Currently, cyclists are often stereotyped as either "lycra-clad" commuter cyclists or hipsters or low-income populations dependent on bicycling for transportation. There are signs that bicycling is becoming more mainstream though with increased program attendance, increasing cyclist count numbers, increased use of bus bike racks, and the installation of increased bike parking and in-street bike "corrals."

5.3 Regulations and Ordinances

There are several ordinances and regulations that could have an impact on implementing bike sharing. These are not necessarily fatal flaws, but could require special attention to address.

5.3.1 Advertising Restrictions

The City of Cincinnati Municipal code places limitations on the use of advertising on items placed in streets or on sidewalks. Anything placed within the right-of-way requires a Revocable Street Privilege. Section 723-6 (Revocable Street Privileges Required) states:

> *(b) Except as specifically allowed herein, no structure governed by this chapter and permitted by a revocable street privilege shall contain any type of advertising[17] as defined herein. The standards set forth in this chapter [723 – Streets and Sidewalks, Use Regulations] apply to the use of streets, sidewalks and public rights-of-way and the placement of structures upon said streets, sidewalks and public rights-of-way, including, but not limited to: (a) Benches and other*

[15] http://www.cincinnati-oh.gov/transeng/downloads/transeng_pdf45646.pdf

[16] http://www.cincinnati-oh.gov/bikes/progress.html

[17] Per Section 723.1 (Definitions): Advertising shall mean all commercial and non-commercial messages whether verbal or non-verbal.

street furniture, (b) Planters, (c) Sandwich board signs, (d) Parcel drop-off boxes, (e) Newsracks, (f) Retail sidewalk displays, (g) Bus stop shelters, (h) Outdoor dining areas, (i) Informational kiosks, (j) Sidewalk vending, (k) Awnings, Marquees and Projecting Signs, (l) Mail boxes.[18]

The advertising restrictions have the potential to impact the use of sponsorship or advertising in funding the system. It is unclear whether advertising would be permitted on the bikes themselves (given they are "non-permanent", movable objects). However an exception will be required to allow advertising or sponsorship on the stations and other fixed infrastructure, as has been granted for streetcar.

5.3.2 Bicycle Ordinances

Some relevant local ordinances related to bicycling[19] include:

- A requirement for children 15 years and younger to wear a helmet – adults are not required to wear a helmet;
- A requirement that all bicyclists must have a bell or a similar device on their bike at all times (which is typically a standard piece of equipment provided by bike share vendors);
- Bicyclists are provided rights to the road, including riding with traffic whether a bicycle lane or other facility is present or not; and
- Bicycling on sidewalks is prohibited for people older than 15.

5.4 Physical Characteristics

5.4.1 Topography

Topography will have an impact on the use of bike share in Cincinnati. The area being considered consists of two generally flat areas separated by a long, steep grade. The Downtown and OTR areas are generally flat with some short grades heading towards the Ohio River. Uptown is more undulating, although most hills are within the tolerances of casual cyclists.

The most significant grade is the long steep slope separating the Central City and Uptown areas. The hill between these two areas would likely separate the system into two mini-systems although some users may choose to bicycle down the hill from Uptown and return using transit (or a future streetcar), which will require the operator to rebalance the system by taking bikes back up the hill.

5.4.2 Weather

Weather can influence bike share demand. Figure 11 shows the average monthly high temperature in Cincinnati. The city generally experiences warm to hot temperatures during summer months, with highs in the low to mid 80s, and moderately cold winters, with daily highs in the low 40s. The city averages 42.5 inches of rain annually, with monthly precipitation averages close to even across the year. Cincinnati averages 22 inches of snow per year, typically occurring between December and March.

[18] http://library.municode.com/index.aspx?clientId=19996&stateId=35&stateName=Ohio

[19] http://www.cincinnati-oh.gov/transeng/downloads/transeng_pdf42985.pdf

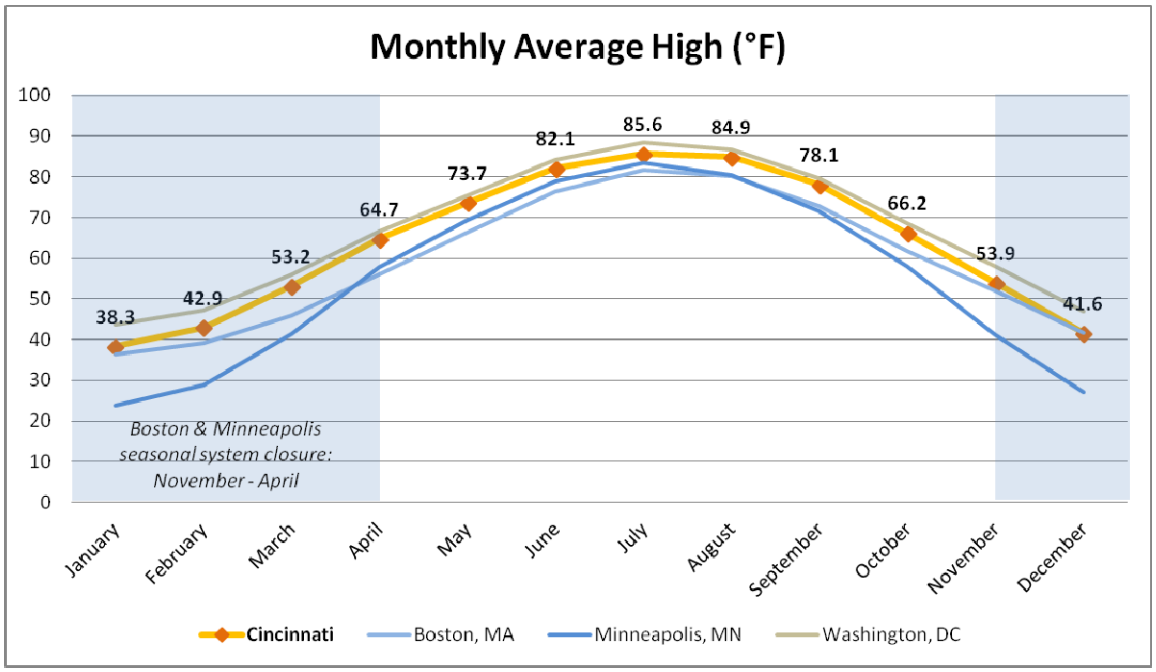

Figure 11 – Comparison of Weather in Cincinnati with other Cities that have invested in Bike Share

The highest demand months for bike share are typically from May to September, during the best riding weather and peak tourist season between Memorial Day and Labor Day. Demand will typically be lower on extremely hot days.

Systems such as Minneapolis, Montreal, and Boston shut down the system and store it during winter months – primarily due to the large amount of snowfall and number of days with excessively low temperatures. However, Washington DC sees similar temperatures and snowfall to Cincinnati and remains open for the winter. Closing the system for winter may also be an option for Cincinnati. This decision should balance:

- Snow clearance and maintenance: the operator would be responsible for clearing snow from the station, but in-street stations pose an obstacle for snow plough.
- Potential lost revenue: although demands will be lower in winter;
- Lost advertising exposure: even if demands are lower, a higher sponsorship value may be possible by keeping the infrastructure on the street and visible;
- Operating costs: closing the system would save on maintenance, e.g. snow removal, but would likely cost money to store; and
- Staffing: if the system employs full time staff, they will need to be kept busy on other tasks during winter.

5.4.3 Station Placement

Fourth generation station technology has the advantage of being modular, relying on solar power and wireless communications that do not require excavation or hardwiring. As such stations can be moved, relocated, or expanded to meet demand.

Stations locations should be visible and accessible and need to consider other modes of travel (e.g., they should not impede pedestrian circulation or be placed in bus zones or block building entrances). There may be opportunities to place stations under existing cover, although stations do require a certain amount of vertical clearance and solar access.

Examples of typical station placements are shown on Figure 12. In Cincinnati, station placements should consider:

- Sidewalks: many of the sidewalks in Cincinnati are generally quite narrow. Bike share stations are approximately 6 feet deep with bikes parked. The Engineering Department should be consulted to determine what width of sidewalk is considered appropriate to maintain sufficient pedestrian circulation. This may vary depending on the volume of pedestrians.

- On-street: many Downtown streets have peak hour parking restrictions to allow for an additional motor vehicle travel lane during peak times. Stations cannot be placed in 'on-street' locations on these streets, but could be placed on the sidewalk if there is space.

- Off-street sites: station locations in publically owned plazas, public spaces, or in parks would require consultation with the relevant city or agency department. Agreements would need to be negotiated between the owner / operator and the individual land owner for stations placed on private lands.

Figure 12 - Example Station Placements – Sidewalk (Melbourne Bike Share), In-Street (Nice Ride Minnesota), Public Plaza (Des Moines B-Cycle).

The dimensions of a 20-position (i.e. 19 docks plus the terminal / kiosk) station from Montreal's BIXI system are shown on Figure 13. Other vendors have similar dimensions with a station being approximately 6-feet deep with bikes parked (approximately 3-feet deep without bikes) and modules with every 10-feet in length representing about four docks.

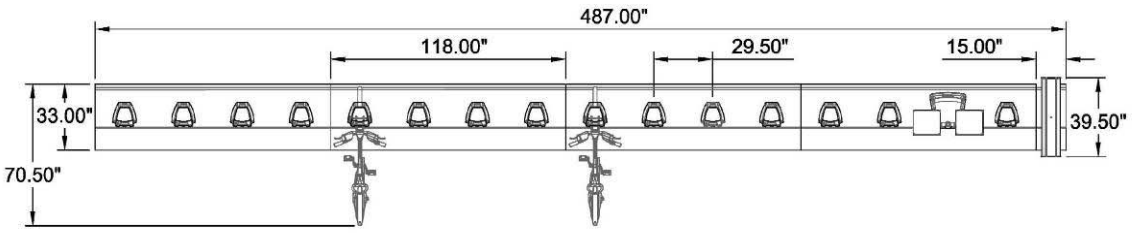

Figure 13 – Example Station Dimensions (Based on information from PBSC)

5.5 Transit Integration

Public transit in the Cincinnati region is composed primarily of two services: Metro, which is part of the Southwest Ohio Regional Transit Authority (SORTA) serving the greater Cincinnati area; and the Transit Authority of Northern Kentucky (TANK), which provides transit service to the areas of Northern Kentucky with connections to Downtown Cincinnati.

Metro operates bus service along the routes shown on Figure 14 and records approximately 17 million rides annually. The route network is a radial system with most services running through the major transit hub located at Government Square.

Metro recognizes that bicycling can extend and enhance its service and has already equipped the entire bus fleet with bike racks. Initial discussions show that Metro staff is supportive of the idea of bike sharing, particularly its potential to offer a last mile transit option.

In Uptown, Metro is currently conducting public outreach as part of *Way to go*, an update to the agency's plan for future transit service and investment. Preliminary plans propose to develop enhanced bus stops at four high ridership locations:

- Vine Street between McMillan and Calhoun;
- Jefferson/University;
- UC Hospital main entrance; and
- Clifton / Calhoun – McMillan intersection.

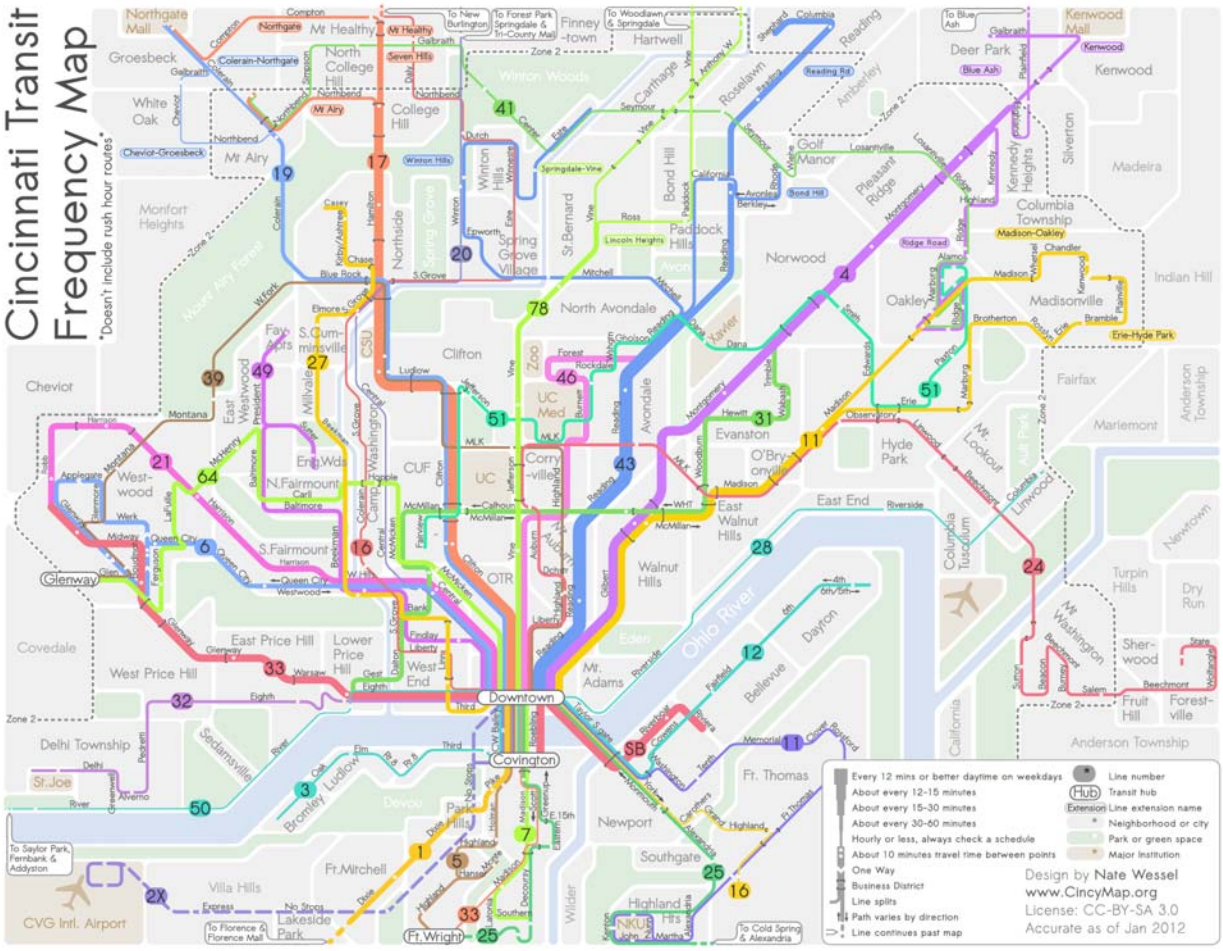

Figure 14 – Overview Transit map of Cincinnati (Source: http://www.cincymap.org/index.php)

TANK provides transit service to the areas of Northern Kentucky with connections to Downtown Cincinnati. The Southbank Shuttle Trolley is a key route traveling along the Covington and Newport waterfronts and crossing the Taylor-Southgate and Roebling Suspension bridges into Cincinnati.[20]

Cincinnati is also exploring a streetcar system with the initial phase to operate on a 4-mile loop around the city's urban core as shown in Figure 15. Future phases would connect to Uptown and the University of Cincinnati, hospital campuses and the zoo. Each streetcar will hold about 165 passengers and bicycle accommodations will be provided.[21]

[20] http://www.tankbus.org/routes-schedules/southbank-shuttle.aspx

[21] http://www.cincinnati-oh.gov/noncms/projects/streetcar/

Figure 15 – Proposed phase 1 streetcar loop
(Source: http://www.cincinnati-oh.gov/noncms/projects/streetcar/streetcar_travel.cfm)

There is a significant opportunity for bike share to complement existing (and future) transit services. A significant number of people arrive in Downtown, OTR, and Uptown via transit (e.g. approximately 20% of the Downtown workforce use Metro for their commute[22]) from which point a bike share bike could transport them the remainder of their trip or allow them to move around spontaneously throughout the day.

5.6 Jurisdictional Boundaries

Extending the bike share system across the Ohio River into Covington and Newport in Kentucky in the future would add destinations to the network as well as open up more options for recreational rides and a greater sense of inclusion for Kentucky residents.

New communities would be subject to many of the decisions made by Cincinnati but the system could be set up, as in Washington D.C. / Arlington or in Boston, to allow other cities to enter directly into a separate contract with the operator of the system. Although many system parameters would need to be consistent between cities, some flexibility would be possible, e.g. establishing independent service levels, having separate sponsors, different funding sources, etc. System parameters and the allocation of costs and revenues would need to be negotiated between cities.

[22] http://www.go-metro.com/about-metro/faqs

5.7 Issues and Opportunities Analysis

This section summarizes the results of the local context analysis and makes an assessment on the preparedness of Downtown, OTR, and Uptown for bike sharing.

Demographics

Although city-wide population density is low compared to other bike share cities, there are a number of enclaves of early-adopter populations including:

- Young, urban professionals, especially living in Downtown and OTR.
- Students living on or near the University of Cincinnati campus.

Employment

There are a number of large employers, particularly in Downtown and Uptown, that could deliver large numbers of members to the program. Opportunities to involve these organizations include:

- Corporate membership packages offered as part of company Travel Demand Management programs.
- Direct purchase of stations – this could be particularly relevant in Uptown where a joint initiative of the University and the health care / medical institutions could form the backbone of an Uptown bike share program.
- Potential sponsorship: either as individual station sponsors or for larger companies such as Kroger's, Proctor & Gamble, etc. involvement as an overall program sponsor.

Visitors

While not a major tourist destination, Cincinnati does have a number of visitor destinations (including arts and sporting venues) and a large annual convention and events calendar. Bike sharing should not rely on the same revenue contributions from visitors as in other cities, but would enhance connections between destinations / city landmarks and attract national and international recognition.

Bicycle Infrastructure

There is currently very little dedicated bicycle infrastructure in Cincinnati. This will not pose a major problem in Downtown and OTR, where bicycling conditions are relatively comfortable. However, it will require a more strategic deployment of stations in Uptown to promote use of more comfortable streets until the bikeway network catches up with demand. In other cities, bike sharing has accelerated investment in bikeway infrastructure.

Bike Culture

There is an increasing bike culture in Cincinnati as well as a movement of support from decision makers and the public. Bike sharing can help normalize biking away from its current stereotypes.

Regulations/ Ordinances

Existing advertising restrictions could impact the use of sponsorship or advertising revenues to fund the system. An exception, similar to that granted streetcar would be required.

Topography

Downtown and OTR are relatively flat and ideal for cycling, Uptown terrain is hillier, which could have some impact on system usage. The steep grade between Downtown / OTR and Uptown will physically separate the program into two mini-systems with little

ridership expected between systems (particularly uphill).

Weather Demand will be impacted by extreme temperatures (both hot and cold). Weather conditions are such that winter operations could be considered. This decision can be left to an operator to respond to in an RFP and should include how they would address snow removal and operations during inclement weather.

Physical Space Sidewalks are generally narrow and would need to ensure sufficient width for pedestrian circulation. On-street locations (provided in place of parking) would need to avoid the use of peak hour parking lanes. Additionally, the City would need to decide if they are prepared to accept lost revenue from metered parking replacement (as an "in-kind" contribution to the program). Off street sites on public or private lands would make good sites, but would need consultation and agreement with the relevant land owners.

Transit Bike sharing has natural synergies with transit. It can extend the reach of the system and offer a last-mile option. Stations should be located close to (visible, where possible) major transit hubs such as Government Square in Downtown and the high ridership stops identified by Metro in Uptown. The location of stations near future streetcar stops will need to be considered at that time.

In general, there are enough positive indicators to suggest that bike sharing is feasible in Cincinnati including a density and mixture of land uses that offers a variety of potential users, a supportive policy environment seeking to increase the role of bicycling, and a trend for investment and reinvestment in the health and vibrancy of the urban core. There are no fatal flaws, although a smaller dependency on visitors and ordinances restricting advertising would need to be overcome to make the system financially viable.

The Downtown / OTR area makes for a logical first deployment of bike sharing in Cincinnati. It provides the highest density and mix of land uses including a number of significant employers, several entertainment and retail districts, tourist accommodations and attractions, and significant transportation hubs serving transit and drive-in commuters. The well connected streets, relatively slow speeds, and generally flat topography make for a relatively comfortable cycling environment. Redevelopment in these areas has also shown a commitment to healthy and active lifestyles.

The Uptown area also has a number of features appealing to bike share. A system could be developed focused on stations at the University of Cincinnati and the health care / medical campuses. These could be linked to major transit hubs and commercial / retail districts in Uptown. However, destinations are more spread out than those in the central city and the hillier topography and faster traffic speeds make for a less comfortable cycling environment. Stations would need to be strategically located to promote the use of more comfortable streets until such time as infrastructure catches up with demand.

6 System Planning

This chapter considers the extent, size, and phasing of a potential bike share system in Downtown/OTR and Uptown and defines parameters for the system such as the spacing of stations, the number of bikes per station, and the number of extra docks. It also identifies typical station placements and identifies considerations for expanding the system in the future.

6.1 Service Area

Areas with high potential demand for bike share were identified through a heat mapping exercise that allocated "points" to where people live, work, shop, play, and take transit. Launching the system initially in the highest demand areas will accelerate visible success and maximize the chance of the system being profitable.

The heat map shown on Figure 16 confirms that the Downtown and OTR areas have the highest demand potential and therefore would make the most logical first phase. The Uptown area also scores well and, anchored by the University of Cincinnati, large hospital campuses, and several mixed-use commercial areas, would be a logical expansion to the system.

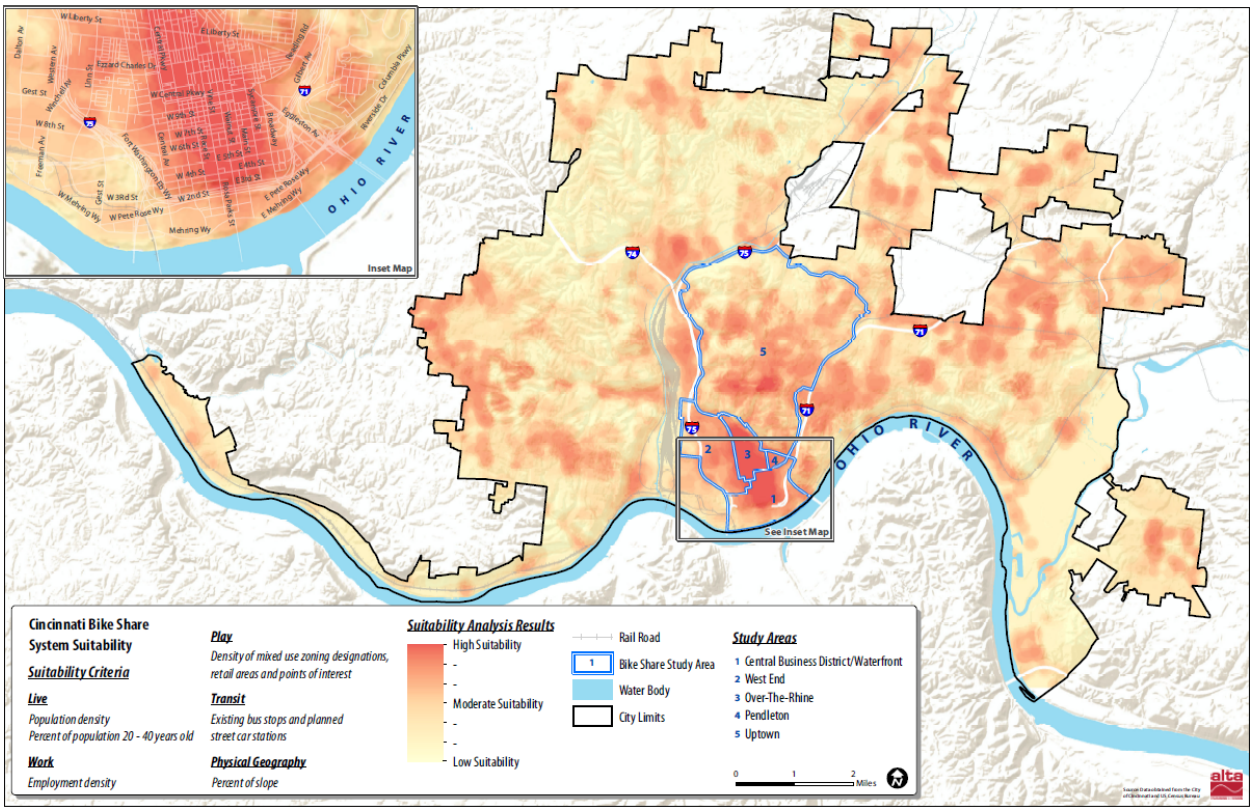

Figure 16 – Suitability Analysis for Cincinnati

The decision to expand beyond Downtown/OTR and Uptown will depend on initial system success, typically measured in terms of visible achievements such as high ridership, positive public response, neighborhood and corporate requests for service area expansion, and on-going financial performance and available funding. Future phases could include Northside, Xavier University, Cincinnati State Technical and Community College, areas Northeast of Downtown such as Hyde Park Square, and Covington and Newport in Northern Kentucky.

6.2 System Parameters

Key considerations in system planning include: providing stations at an appropriate spacing so users can easily access bikes; ensuring that the system is not too small to be effective; and identifying an appropriate dock-to-bike ratio to balance capital and rebalancing costs.

6.2.1 Station Density

The size of the system is a function of the coverage area and the desired spacing / density of stations. State-of-the-practice in other North American bike share systems suggest that stations should be spaced no more than 1,000 feet to 1,300 feet apart on average. This range provides access to a bike within a short walk of anywhere in the service area and provides a nearby alternative to return a bike if the destination station is full.

Based on this rule of thumb, the Downtown / OTR area, approximately 1.4 square miles, could accommodate approximately 20 stations. Uptown is geographically much larger at 6.8 square miles, but the area has a number of activity nodes (such as the University and medical campuses) that will determine station locations rather than providing stations at an average density. A system of approximately 15 stations would be sufficient to serve Uptown.

6.2.2 Minimum System Size

A system that is too small limits its effectiveness. A system of 10 stations is considered the absolute minimum to provide an effective mix of trip origins and destinations and to justify the cost of operations. The following should be considered when planning the system:

- The coverage area at which bicycling becomes a more attractive option than walking. The median walking trip is approximately five minutes, in which time a person can walk approximately ¼ of a mile, but can cycle approximately ¾ of a mile.
- The system must provide a variety of trip origins and destinations or there is no reason to use the bikes.
- The system should provide a reasonable station density so that users can easily access a station. If stations are too far apart, users will consider they have to walk too far to access a bike and will not make the trip or will take a different mode.
- The system needs to be a reasonable size to justify the cost to operate the system. There are some economies of scale in terms of operating the system.

6.2.3 Station Plan

Preliminary recommendations for bike share station locations were determined based on the results of the heat map, from public input gathered via an online web-mapping tool, and considering major destinations such as:

- Tourist attractions, landmarks, civic facilities;
- Higher density housing and employment centers;
- Key transit stops;
- Tourist accommodations and hotels;
- Neighborhood and commercial centers;
- College and hospital campuses (Uptown).

A web-based tool was developed for this project to gather input from the public on potential station locations (http://cincybikesharestationmap.com). Individuals were able to place points on an online map of Cincinnati to indicate a suggested location and provide supporting comments. Subsequent users were able to add their own locations, leave comments, or support locations proposed by others. The results of the public input are provided in Figure 17 below.

The highest supported stations included those at Washington Park, Fountain Square, Findlay Market, the Purple People Bridge, Ludlow Avenue, Eden Park, Union Terminal, and Government Square. Several other locations were well supported including sites on the University of Cincinnati campus, along McMillan/Calhoun, The Banks, Coffee Emporium, the Cincinnati Zoo, Duke Energy Convention Center, Lytle Park, the Great American Ballpark, and at major employers such as Procter & Gamble and Hewlett Packard.

Some locations were suggested outside of the primary study area, which should be considered for future expansion of the system. This includes: Newport on the Levee, Xavier University, the Northside neighborhood, DeSales Corner, and Hyde Park Square.

Based on this input a preliminary station map was developed and is shown in Figure 18. The majority of high-supported stations are represented on the preliminary plan, or have a nearby location instead. Specific station locations, e.g. the specific intersection corner or block face will need to be determined as part of the implementation phase.

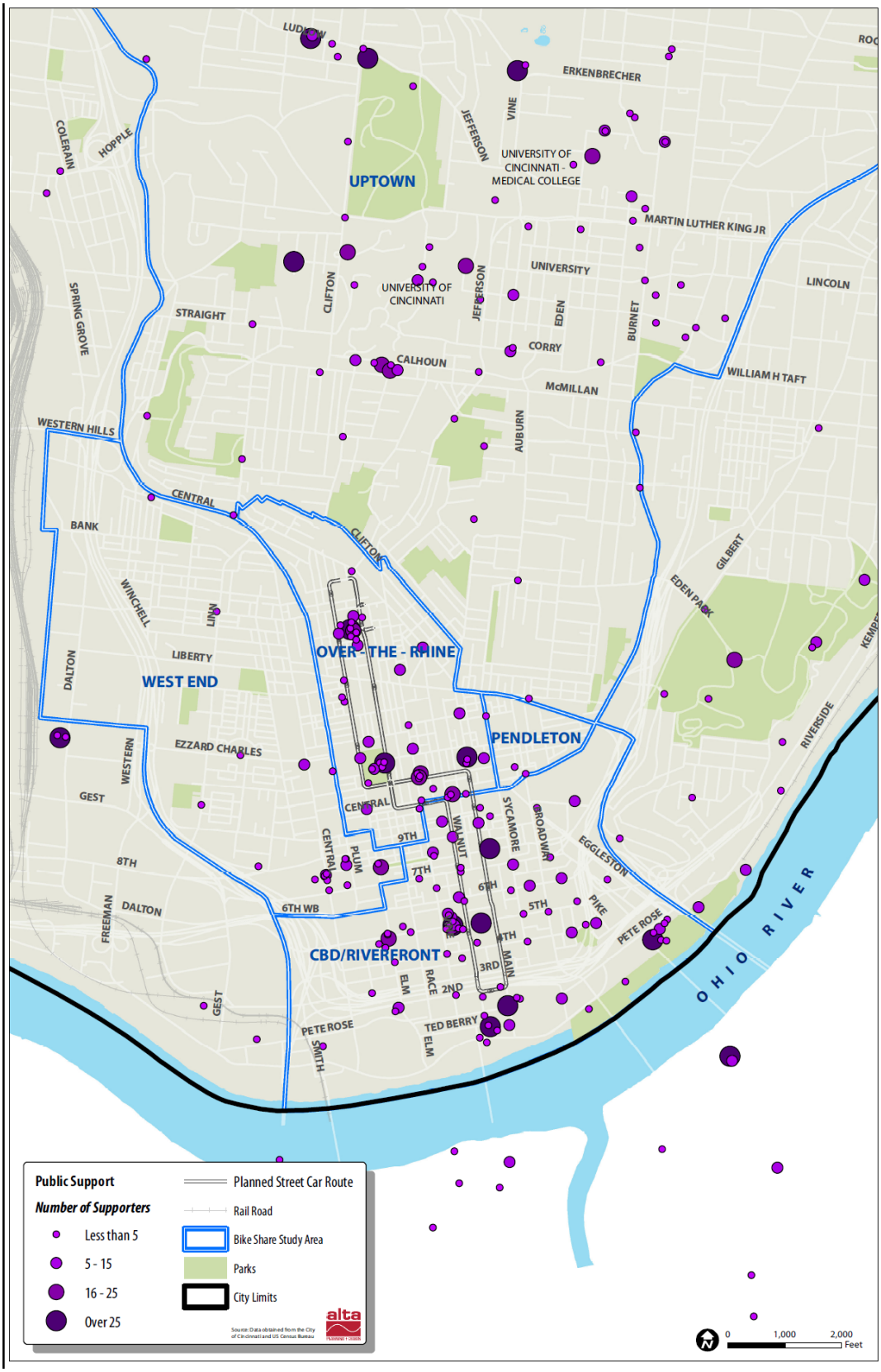

Figure 17 - Station Locations Suggested by the Public

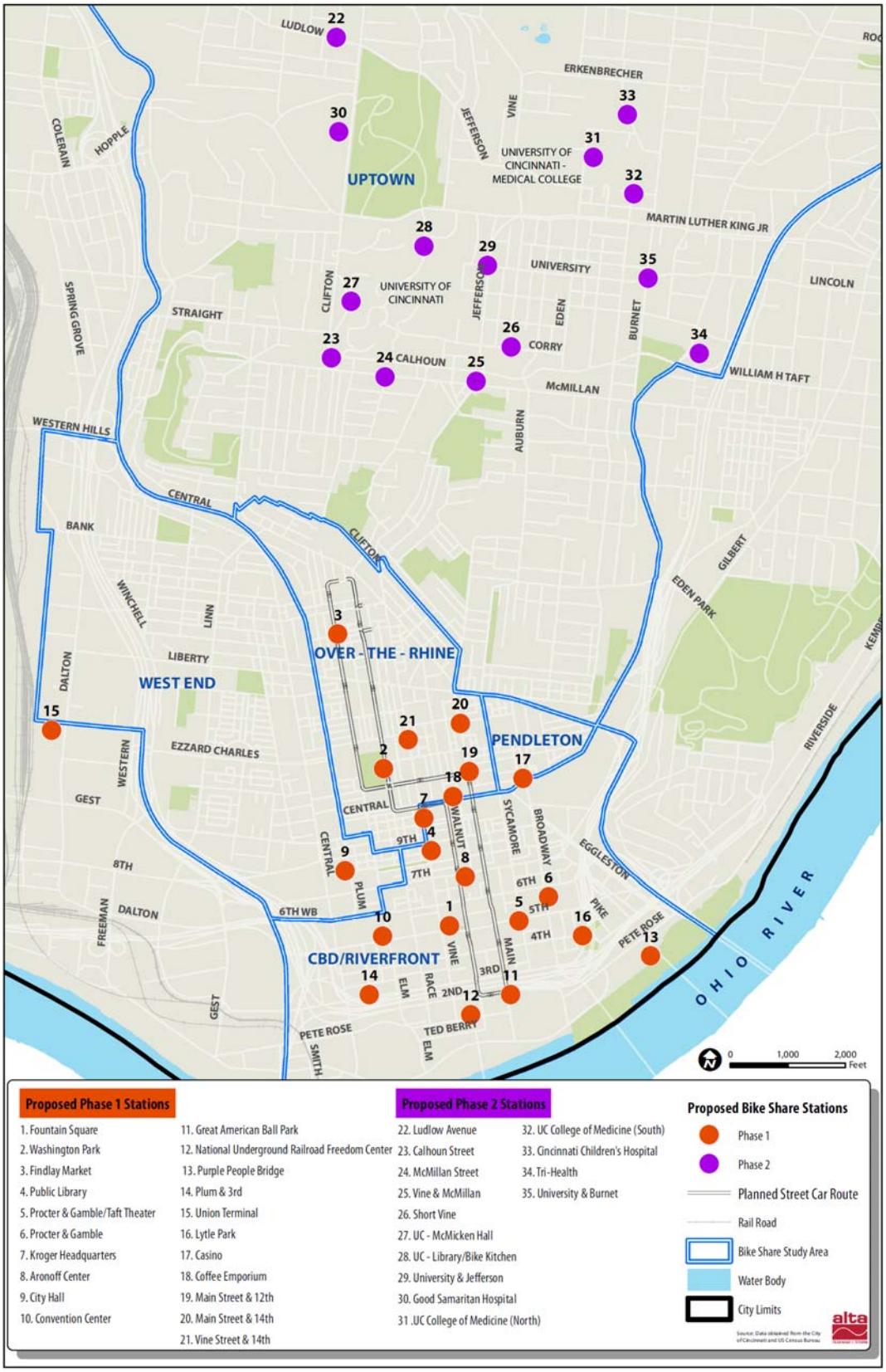

Figure 18 - Preliminary Station Plan

6.2.4 Number of Bikes and Docks

A comparison of bike-to-station ratios is included in Table 7. For a city the size of Cincinnati, a ratio of 10 bikes per station would be appropriate. The size of each station will vary depending on demand, however stations should have no less than five to seven bikes to ensure that a sufficient number of bikes are available at any given time.

Table 7 – Dock-to-Bike Ratio for North American Bike Share Systems

City	Bikes	Stations	Bikes-to-Station Ratio
Minneapolis	1200	116	10.3
Denver	520	52	10.0
Washington D.C. / Arlington	1,560	179	8.7
Boston	610	61	10.0
Montreal	5,050	405	12.5

It is important that there be sufficient empty docks for riders to return bikes. Operators have tried dock-to-bike ratios ranging from 1.5 docks per bike to 2.0 docks per bike. Higher ratios require more upfront capital cost, but save the operator significant rebalancing cost as there is less need to empty stations to create space for bike return. A ratio of 1.7 docks per bike is a reasonable balance and is recommended for Cincinnati.

The following bike and dock numbers are recommended for the initial deployment of bike share:

- Downtown / OTR: 21 stations including 210 bikes and 360 docks.
- Uptown: 14 stations including 140 bikes and 240 docks.
- Total: 35 stations including 350 bikes and 600 docks.

6.2.5 Equity

Given the need to be financially self-sufficient, bike share systems have typically launched in high demand areas such as downtowns, which tend to have higher proportions of young, high income populations. However, more recently, some cities such as Minneapolis and Washington D.C. have started to expand into lower demand areas, with a particular emphasis on making the system available to all users and to provide an additional, low-cost transportation option to under-served communities. Increasingly, geographic and social equity have become important considerations for new and existing bike share systems.

A spatial analysis of three variables associated with traditionally underserved populations was conducted as part of this study. The analysis considered: the percentage of population living in poverty, the percentage of non-white population, and the percentage of non-English speaking population with the highest occurrences of these populations shown in Figure 19 as a “composite equity map” that combines the percentage scores in each criteria by census tract.

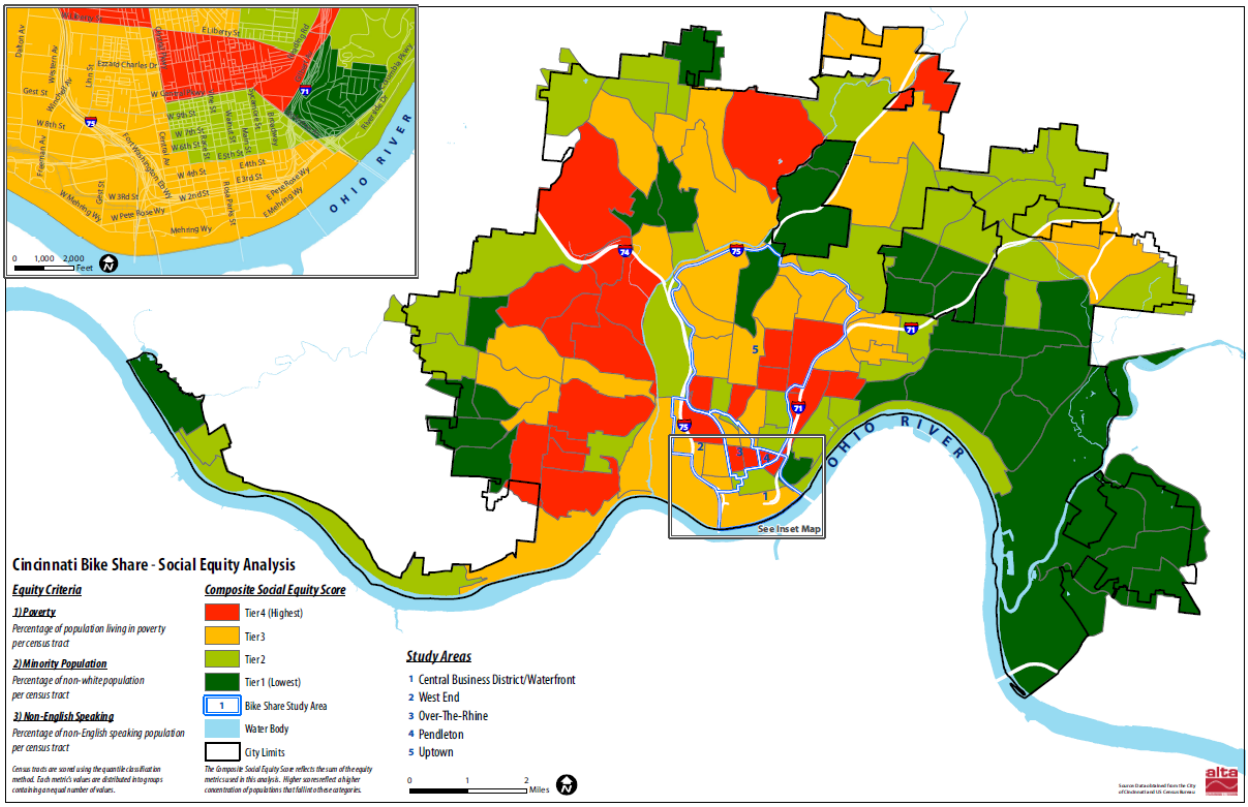

Figure 19 - Social equity in Cincinnati as measured by three factors from US Census data.

The proposed initial bike share system in Downtown, OTR, and Uptown overlaps with a high proportion of traditionally underserved communities, particularly at the north end of OTR and at the eastern edge of Uptown. Bike share can provide a low-cost travel option for these populations and there are a number of strategies that can be employed to engage these populations. Strategies employed in other cities include:

- Guarantor programs to provide access for unbanked populations (i.e. those without credit cards). These programs shift responsibility for the bike from the individual to the guarantor organization.

- Boston: the operator partners with the Boston Public Health Commission to sell $5 memberships. The Boston Medical Center has a pilot a program called "Prescribe a Bike" for low income individuals with health related issues that care providers believe can be addressed, in part, by moderate exercise. The program allows physicians to literally prescribe Hubway membership at no cost to the patient.

- Washington, DC: the operator works with Bank On DC, an organization that seeks to provide financial education and services to unbanked families and individuals. Reduced price memberships are provided to Bank On DC account holders.

- New York City: significant outreach to low income and non-English speaking populations has been conducted prior to the launch of Citibike to increase awareness of the system and station locations, distribute bicycling safety resources (such as helmets), and provide information on registration and assisted payment options.

7 User Demand and Financial Assessment

This section compares expected system costs to forecasted user demand and revenues to determine any additional funding requirements. Suggested funding and potential funding strategies are explored in detail.

7.1 System Costs

There are three major costs associated with a bike share system – start-up costs (broken into **capital** and **launch** costs) and **operating** costs. Each of these costs are described in detail below. A five-year cost estimate, based on rates observed in other cities with similar sized bike share programs, is presented in Table 8 for the following scenarios:

- Scenario 1: 21 station / 210 bike system in Downtown and OTR.
- Scenario 2: 35 station / 350 bike system in Downtown, OTR, and Uptown.

Table 8 – Five-Year Cost Estimate for Proposed Cincinnati Bike Share Program

Costs	Scenario 1 (21 stations/210 bikes)		Scenario 2 (35 stations/350 bikes)	
	Low	High	Low	High
Launch	$300,000	$350,000	$500,000	$550,000
Capital	$900,000	$1,000,000	$1,500,000	$1,750,000
Operating	$450,000	$600,000	$750,000	$1,000,000
Total	**$1,650,000**	**$1,950,000**	**$2,750,000**	**$3,300,000**

7.1.1 Launch Costs

There are a number of "general system start-up" costs associated with establishing the system. These are mostly onetime costs (or are significantly less for future phases) that include "up-front" costs such as hiring employees, procuring a storage warehouse, purchasing bike and station assembly tools, website development, communications and IT set-up, and pre-launch marketing. There may be opportunities to reduce some of these costs through partnerships with other organizations or public agencies, e.g. to use city-provided warehouse space.

Each phase has a start-up cost also. These include site planning and permitting, bike and station assembly, station installation, etc.

7.1.2 Capital Costs

These are the costs associated with purchase of equipment including stations, kiosks, bikes, and docks. Equipment costs vary depending on system parameters such as the number of bikes per station or the number of docks per bike, but also depend on additional features such as additional gearing, an independent lock, or equipping bikes with GPS.

Per station capital costs vary between vendors and depending on features and station size, but typically range from $40,000 (low) to $50,000 (high) per station.

7.1.3 Operating Costs

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

- Station maintenance: including troubleshooting any technology problems with the kiosk or docking points, cleaning and clearing the station, snow removal, removing litter and graffiti, etc.
- Bike maintenance: including regular inspection and servicing of bikes as well as maintaining equipment inventory, etc.
- Rebalancing: typically the highest operating cost for the system is the staff time and equipment associated with moving bikes from full to empty stations.
- Customer service: providing a responsive customer interface for enquiries and complaints as well as performing marketing and outreach to new and existing customers.
- Direct expenses: such as maintaining an operations facility, purchasing tools and spare parts, upkeep of software, communications, and IT, and general administrative costs such as insurance.

Operational costs will depend on a numerous factors, but are most influenced by the Service Level Agreement, which sets out the operating terms that must be met, e.g. how long a station can remain empty, how often bikes are inspected, snow removal policy, etc. The agreed upon service levels will need to balance operating costs with the impact on customer service from any operating cost cuts. Depending on the service levels, operating costs could range from $2,200 to $2,900 per bike per year.

7.1.4 Reducing Costs

City agencies and other organizations can play a key role in minimizing costs by providing station right-of-way and a streamlined permitting process. There may be other in-kind contributions to reduce budget line items such as providing free or low-cost warehouse space, utilizing the existing city vehicle fleet, staff assistance for map design and production, assistance with marketing and promotion, etc.

7.2 Funding

Most North American bike share systems have pieced together funding from whatever sources are available including federal or state grants, local public funding, private or corporate sponsorship, and user-generated revenues. A discussion of the potential for each of these funding sources in Cincinnati is included below.

To date, most systems use a combination of public and private funding but have used limited *local* public funding (versus federal or state public funding) beyond in-kind services such as staff time, right-of-way use, lost on-street parking revenues, etc. Table 9 details the various funding sources used in other North American bike share systems.

Table 9 - North American Bike Share System Funding Sources

System	Bikes	Stations	Approximate Service Area	Population	Launch Date	Total Capital Funding	Public Funding Amount	Private Funding Amount
Boston	610	61	8 sq. mi.	620,000	2011	$4 million	$3 million (75%, CDC Communities Putting Prevention to Work, CMAQ, FTA Bus Facilities Livability Initiative Program, State grants).	$1 million (25%, multiple local sponsors and a naming sponsor).
Capital Bikeshare – Washington D.C. (Phase 1)	1,110 (bikes circulate between both Washington DC and Arlington)	91 (105 total)	8 sq. mi.	600,000	September 2010	$5 million	$5 million (83% CMAQ, 17% District funding)	$0
Capital Bikeshare – Arlington (Phase 2/current)		14 (105 total)	1 sq. mi.	210,000	September 2010	$500,000	$200,000 (40%, state grants)	$300,000 (60%, local BID sponsorship)
Capital Bikeshare – Washington D.C. (Phase 2)	1,560 (400 new; bikes circulate between both Washington DC and Arlington)	138 (179 total)	12 sq. mi	600,000	2011	$1 million	$1 million (74%, CMAQ).	$350,000 (26%, revenues from system).
Capital Bikeshare – Arlington (Phase 2/current)		41 (179 total)	4 sq. mi.	210,000	2011	$1.5 million	Undisclosed.	Undisclosed.
Chattanooga	300	30	3 sq. mi.	170,000	2011	$2 million	$2 million (100%, CMAQ)	$0 (future sponsorship may be sought)
Denver Bike Sharing	500	50	5 sq. mi.	600,000	April 2010	$1.5 million	$210,000 (16%, ARRA federal Energy Efficiency and Conservation Block Grant program).	$1.3 million (84%, Kaiser Permanente as "presenting sponsor", Denver 2008 DNC Host Committee, several foundations, multiple station sponsors).
Fort Lauderdale	200	20	25 sq. mi.	170,000	2011	$1.1 million	$300,000 (27%, Florida DOT funds)	$800,000 (63%, sponsorship / advertising)
Montreal	5,050	405	24 sq. mi.	1,650,000	2008	$33 million	$33 million (City funds) to develop and market technology and plan the initial system.	Subsequent stages funded by sponsorship, advertising, and user fees.
Nice Ride Minnesota (Phase 1)	700	73	12 sq. mi	380,000 (Minneapolis)	June 2010	$3.0 million	$1.75 million (58%, Bike Walk Twin Cities / FHWA). $250,000 (8%, City Convention Center Fund).	$1 million (33%, Blue Cross Blue Shield tobacco settlement funds).
Nice Ride Minnesota (Phase 2/current)	1,200 (500 new)	116 (63 new)	30 sq. mi.	670,000 (Minneapolis & St. Paul combined)	2011	$2.3 million	$1.0 million (43%, Bike Walk Twin Cities / FHWA). $200,000 (9%, ARRA US Department of Health and Human Services). $150,000 (6%, University of Minnesota).	$700,000 (30%, Blue Cross Blue Shield). $250,000 (11%, Central Corridor Light Rail Funders Collaborative). $30,000 (1%, Macalester College).
San Antonio	140	14	3 sq. mi.	1,330,000	2011	$840,000	$840,000 (100%, U.S. Dept of Energy's Energy Efficiency and Conservation Block Grant (EECBG) program, CDC)	$0

Note: All numbers in this table are round numbers from various publicly available sources, as well as other sources.

7.2.1 Grants, Federal, and State Funding

Typically used for capital funding, a number of North American bike share systems were funded primarily through federal or state grants such as CMAQ, FTA, FHWA, or CDC funding. For the most part, these sources have been tapped out in Cincinnati in pursuit of streetcar and other projects. Federal and state grant funding can also take a long time to materialize and is often less flexible than other sources. It is recommended that staff look for new grant opportunities as they arise, particularly for future expansion of the system into lower demand areas.

7.2.2 Local Public Funding

Very few cities have used local public funding for the initial deployment of bike sharing, although some cities have provided smaller "match" amounts as a show of support or to encourage the private sector in a public / private business model. These funds are most likely to be directed towards capital costs or a specific annual amount for operations. Agencies are less likely to want the responsibility (and uncertainty) of funding annual operating costs.

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

7.2.3 Private and Corporate Funding

Almost all U.S. bike share systems rely on some portion of private funding. This can be in the form of donations (such as in Denver and Boulder), sponsorship (such as in Minneapolis), and/or advertising (such as in Boston).

There is a subtle difference between advertising and sponsorship. Advertising includes a contract with a company to provide a regularly changing graphic display and message, which could be independent of the bike share station on other street furniture. The advertiser and/or message may not be associated with bike sharing or bicycling in general. Sponsorship typically involves a longer-term relationship between the sponsor and the vendor, where stickers are put on the infrastructure (bikes, stations, and/or website) with a logo and/or statement that "Company X supports Cincinnati Bike Share".

Sponsorship provides the greatest funding opportunity in Cincinnati given the number of large employers, several Fortune 500 and Fortune 1000 companies headquartered in the city, and the number of medical institutions with health and wellness being central to their mission. Experience in other cities has shown that companies are generally interested in sponsorship for its positive media and "good corporate citizen" benefits more so than the amount of advertising exposure it provides.

The value of sponsorship will vary significantly between cities and the level of branding. For example, New York City obtained system-wide sponsorship from Citibank for $41 million ($68,000 per station for 600 stations) that includes the Citibank branding on all bikes, kiosks, and media (see Figure 20) whereas sponsorship packages are sold in Denver for $20,000 to $30,000 per year and include logo placement on the station kiosk, logo placement on 10 bikes, and links on the website.

There are generally two approaches to sponsorship:

- System-wide sponsorship: this can be a single sponsor that pays for full branding of system infrastructure, e.g. London or New York, or multiple sponsors that split the cost in exchange for proportional branding, e.g. Montreal or Toronto:
    - Advantages: one-time sale of sponsorship, known timeline and full "occupancy", consistent and recognizable branding.
    - Disadvantages: often difficult to secure sponsor given the large initial investment, less opportunity for smaller businesses to get involved, competing brands can conflict certain tenants or nearby businesses.
- Multiple sponsors: this model ranges from a single large sponsor paying for branding of a portion of the infrastructure but still allowing smaller station sponsors, e.g. Minneapolis, to the model of selling lots of smaller sponsorships, e.g. Miami or Denver:
    - Advantages: fewer competing interest concerns, opportunities for businesses of all sizes to be involved, opportunity to value sponsorship by demand;
    - Disadvantages: income relies on "uptake" of a certain amount of sponsorship each year, significant effort in securing numerous sponsors, less consistent branding.

Figure 20 – Citibank sponsorship of the Citibike program in New York City.

7.2.4 User-Generated Revenues

Some systems record sufficient demand such that user revenues entirely cover the cost to operate the system (e.g. in Washington D.C.). This is not possible in every city; however user-generated revenues will provide some level of income. User revenues consist of:

- Access fees: paid up-front to register for the system. These are typically offered for a variety of time periods ranging from a 24-hour "casual" subscription to annual membership.

- Usage fees: charged to the user based on how long they use the system. Most systems offer a "free ride" period, typically between 30 and 60 minutes where the user pays no additional costs if the bike is returned within that time period. Fees are charged to users on a graduated scale once the free ride period is exceeded. The free ride period and the graduated rate scale can be different for annual members (typically residents) than for casual users (typically visitors).

The logic of the rate system is to: (1) keep annual membership attractive to the resident population, (2) make the rates comparable to other bike share system rates, accounting for cost of living differences, (3) encourage use to the extent it does not compete with existing bike rental vendors, (4) provide reasonable and comparable prices to other public transportation modes, and (5) encourage short urban trips.

The decision to lengthen the free-ride period beyond 30 minutes needs to consider:

- The impact to and encroachment on the bike rental market. The original intent of bike sharing is to provide a short trip mobility option not in competition with bike rental shops that accommodate users for longer trips.

- Reduction in user fees, particularly from casual users. Providing a 45-minute or 60-minute free-ride period lengthens the window for a user to return the bike. Currently, 16% of casual subscribers' trips in Minneapolis and 19% of casual subscribers' trips in Washington DC are between 30 and 60 minutes and subject to user fees ($1.50 per trip). Although this distribution may change with a new time-limit structure, this represents lost revenue. It is feasible to have a longer free-ride period for annual members only, which would result in minimal revenue loss, while retaining the 30 minute period for casual users.

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

The rate structure should be confirmed as part of the response to an RFP. However, a suggested rate structure for Cincinnati based on comparable rates in other cities and taking into account differences in the cost of living is included in Table 10.

Table 10 – Proposed Rate Structure for Cincinnati Bike Share

	Casual Fee Structure	Member Fee Structure
Base Subscription	**$5/day; $12/3-day**	**$75 annual**
Duration:	Per trip fees	
0-30 mins	$-	$-
30-60 mins	$2.00	$1.50
60-90 mins	$6.00	$4.50
Additional 30 min increments	$8.00	$6.00
>7 hours	$100.00	$75.00

Usage forecasts were developed from Alta's Bike Share Demand Model, an empirical model based on observed monthly station demands compared to surrounding land use and demographics. The model was applied to the preliminary Cincinnati station plan and extrapolated to annual forecasts using monthly cycling profiles recorded by automatic bicycle counters in other mid-western cities.

Bike share systems typically take a number of years to "mature" to their full demand potential and as such, a "ramp up" profile was applied to the forecasts based on experience in other cities. As well, observed trip per member rates were applied to the forecast to estimate the number of annual members and casual subscribers.

A five year forecast of annual member and casual subscriber ridership is included in Table 11 for a scenario that includes an initial 21 station / 210 bike deployment in Downtown and OTR and a subsequent deployment of 14 additional stations / 140 bikes in Uptown after one year. The system is expected to perform as follows:

- **Ridership**: the initial 21 stations in Downtown and OTR are expected to generate approximately 105,000 trips in Year 1 (1.4 trips / bike / day). With the injection of additional stations in Uptown, the larger 35 station system is expected to generate approximately 215,000 trips in Year 2 (1.7 trips / bike / day). As the system matures, demand is expected to reach approximately 305,000 trips in Year 5 (2.4 trips / bike / day).

- **Annual membership**: is expected to grow from 1,600 people in Year 1 to 3,100 people in Year 2 and up to 4,100 people by Year 5. These rates assume no specific promotions, which could include large corporate membership sales or discount promotions through Groupon, LivingSocial, etc. In Washington, DC, a membership discount promotion through LivingSocial was successful at signing new bike share program members (approximately 38% of annual members purchased their membership through LivingSocial). The coupon was used more heavily by women and members under 35.

- **Casual membership**: is expected to increase from 9,000 24-hour subscribers in Year 1, to 20,000 in Year 2 and up to 27,000 at system maturity in Year 5. Again, this assumes no specific promotion or marketing, which could include subscription as part of travel deals or hotel accommodations.

First year membership and ridership statistics in Cincinnati were compared to first year statistics in Washington DC, Minneapolis, Montreal, Denver, and Paris for the following metrics:

- Trips / bike / day: the first year ridership forecast for Cincinnati represents approximately 1.4 trips / bike / day, which is on the lower end but comparable to cities such as Minneapolis and Denver (see Table 12).
- Members per bike ratio: the Cincinnati system is expected to see a member per bike ratio of 6.7 and is expected to operate at approximately 65 trips per member (see Table 13), which is mid-range compared to other cities and indicative of the expected proportion of annual members compared to visitors.

The comparison of predicted statistics for Cincinnati to operating bike share systems confirms that the usage and revenue estimates are realistic.

7.3 Financial Assessment

Table 11 applies the suggested rate structure to five-year estimates of membership and demand for the phased deployment of a 35 station / 350 bike system in Cincinnati, which includes an initial 21 station / 210 bike deployment in Downtown and OTR and a subsequent deployment of 14 stations / 140 bikes in Uptown. The resulting user-generated revenue estimate is compared to capital, launch, and annual operating costs to determine the amount of additional funding that will be required over the initial five year operation period.

As shown in Table 11, at system maturity, operating costs are expected to exceed user revenues by less than $100,000 (see the "Year 5" column in Table 11). In comparison, there is no dedicated funding identified to offset the initial capital and launch costs of $1,275,000 and $875,000 in Years 1 and 2 respectively.

Over the five year period, approximately 3 million in funding will be needed to fund capital, launch and operating costs. Considering the most likely source will come from sponsorship, this represents approximately $17,000 per station per year (35 stations and 5 years). This is not an unreasonable rate when compared to cities such as Minneapolis, Denver, and Boston that have obtained anywhere between $10,000 and $50,000 per station per year in sponsorship.

Table 11 - Five-Year Estimate of Demand, Revenue, and Funding Needs

	Year 1	Year 2	Year 3	Year 4	Year 5
Description	Initial deployment of 21 stations in Downtown and OTR, assumes 12 month operations	Continuance of initial deployment with 12 month operations and ramp up of demand, plus an additional 14 stations deployed in Uptown	Continuance of 35 station system with 12 month operations and ramp up of demand	Continuance of 35 station system with 12 month operations and ramp up of demand	Continuance of 35 station system with 12 month operations and full maturity of the system
Demand					
Bikes	210	350	350	350	350
Trips	105,000	215,000	260,000	300,000	305,000
Trips / Bike / Day	1.4	1.7	2.0	2.3	2.4
Member Trips	86,000	170,000	205,000	240,000	245,000
Casual Trips	19,000	45,000	55,000	60,000	60,000
Membership					
Annual Members	1,600	3,100	3,600	4,100	4,100
Casual Subscribers	9,000	20,000	24,000	26,000	27,000
Cost[1]					
Capital	$950,000	$675,000			
Launch	$325,000	$200,000			
Operating (annual)	$525,000	$875,000	$875,000	$875,000	$875,000
Total	$1,800,000	$1,750,000	$875,000	$875,000	$875,000
Funding					
Access Fees	$175,000	$350,000	$420,000	$465,000	$475,000
Usage Fees	$105,000	$235,000	$290,000	$320,000	$325,000
User Revenue / Bike	*$1,333*	*$1,671*	*$2,028*	*$2,243*	*$2,286*
User Revenue / Trip	*$2.64*	*$2.71*	*$2.72*	*$2.63*	*$2.63*
Funding Required	$1,520,000	$1,165,000	$165,000	$90,000	$75,000
Five-Year Total Funding	**$3,015,000 (-$17,000 per station per year)**				

[1] Assumes the average cost of the low to high cost range included in Table 8.

Table 12 - Trip Comparison for First Year of Operation

	Operating Days	Trips	Bikes	Trips / Bike / Day
Cincinnati	**365**	**105,000**	**210**	**1.4**
Montreal	212[1,2]	3,400,000	5,000	3.2
Toronto	169	336,000	1,000	2.0
Capital Bikeshare	375[3]	1,045,000	1,100	2.5
Minneapolis	150[1]	100,817	600	1.1
Denver	224[1]	102,981	500	0.9
Paris	365[4]	27,500,000	20,600	3.66

Notes:
[1] The number of operating days during the 2010 season. This varies season to season depending on conditions.
[2] Represents 2010 data from the third season of operation.
[3] Based on the first 375 days (just over one year) of operation of Capital Bikeshare.
[4] Based on first season Velib data (July 2007 to July 2008) that recorded 27.5 million trips with 20,600 bikes.

Table 13 - Membership Comparison in First Year of Operation

	Bikes	Members	Members / Bike	Annual Trips	Trips / Member
Cincinnati	**240**	**1,600**	**6.7**	**105,000**	**65**
Montreal[1]	5,000	32,371	6.5	3,400,000	105
Toronto	1,000	3,750	3.8	336,000	90
Capital Bikeshare	1,100	18,919	17.2	1,045,000	55
Minneapolis	600	1,295	2.2	100,817	78
Denver	500	1,784	3.6	102,981	58
Paris	20,600[2]	200,000	9.7	27,500,000	138

Notes:
[1] Represents 2010 data from the third season of operation.
[2] Based on first season Velib data (July 2007 to July 2008) that recorded 27.5 million trips with 20,600 bikes.

8 Summary and Recommendations

The purpose of this study was to assess the feasibility of bike sharing in Cincinnati and recommend a proposed system, ownership / operating model, and funding strategy. These items are assessed in the sections below.

8.1 Feasibility

Cincinnati, in particular the higher density and mixed use areas of Downtown, Over-the-Rhine (OTR), and Uptown, have many of the characteristics thought to make a successful bike share system including: a density and mixture of land uses that offers a variety of potential users, a supportive policy environment seeking to increase the role of bicycling, and a trend for investment and reinvestment in the health and vibrancy of the urban core. There are no fatal flaws, although a smaller dependency on visitors (who generally produce more income than resident users) and ordinances restricting the use of street advertising would need to be addressed to make the system financially viable.

The Downtown / OTR area makes for a logical first deployment of bike sharing in Cincinnati. It provides the highest density and mix of land uses including a number of significant employers, several entertainment and retail districts, tourist accommodations and attractions, and significant transportation hubs serving transit and drive-in commuters. Although there are few dedicated bike facilities, the well connected streets, relatively slow speeds, and generally flat topography make for a relatively comfortable cycling environment. Redevelopment in these areas has also shown a commitment to healthy and active lifestyles.

The Uptown area also has a number of appealing features and a system could focus on a network of stations at the University of Cincinnati (student populations are typically large early adopters of bike sharing) and the health care / medical campuses (offering large numbers of employees and a complimentary mandate of health and well-being). Major transit stops and commercial streets such as McMillan / Calhoun, Short Vine, and Ludlow would also be key destinations. Destinations in Uptown are more spread out than in the central city and the hillier topography and faster traffic speeds make for a less comfortable cycling environment. Stations would need to be strategically located to promote the use of more comfortable streets until such time as dedicated infrastructure such as bike lanes catches up with demand.

8.2 Proposed System

Based on typical system parameters such as average station density, bike per station ratio, and dock per bike ratio, a 35 station / 350 bike / 600 dock system is proposed including an initial 21 station / 210 bike / 360 dock deployment in Downtown and OTR and a subsequent deployment of 14 stations / 140 bikes / 240 docks in Uptown the following year.

A Preliminary Station Plan was developed from consideration of key attractions and destinations, areas of highest expected demand, the ability to serve traditionally underserved communities in the Urban Core, and from public input gathered using a web-based mapping tool created specifically for this project. The Preliminary Station Plan is repeated in Figure 21.

Future expansion of the system will be dependent on initial success, public response / request for the system, financial performance, and available funding. Future expansion could include Covington and Newport in Northern Kentucky, as well as other parts of Cincinnati such as Northside, Xavier University, Cincinnati

State Technical and Community College, and areas northeast of Downtown. Expansion into traditionally underserved communities may also become a high priority for the system once established in the Urban Core.

8.3 Operating Model

The advantages and disadvantages of different ownership and operating models were considered in the context of Cincinnati. Overall, it was thought that the most appropriate models include:

- Publically Owned / Privately Operated. In this model the controlling agency (likely the City of Cincinnati) would own the infrastructure and administer the program but would contract with a private company to operate the system. This model requires a dedicated staff position to administer the system as well as an interest from the agency to take on this responsibility. It offers a good compromise between maintaining transparency of operations while making use of private sector expertise. A decision on whether there is sufficient agency interest (and funding for the staff position required) should be made before issuing an RFP.

- Administrative Non-Profit: under this model, an existing or specially formed non-profit would own and administer the system, but contract operations to the private sector (an existing non-profit could be used as a vehicle to establish a new, specially-dedicated non-profit). Using a non-profit provides fundraising flexibility and a generally positive public image associated with the sole mission of providing bike share services. Public agencies maintain some level of control in this model through representation on the non-profit board or as technical advisors.

- Privately Owned and Operated: under this model the system is owned and operated entirely by the private sector. As a result, it provides less control and flexibility to public agencies, but entirely shifts the risk to the private sector. This model is entirely dependent on the interest of the private sector, who will assess their ability to raise the necessary funds and to maintain financial sustainability.

Before releasing an RFP, the City should decide whether they are interested in owning and administering the system. If not, the RFP could be issued stating that the respondent should propose an operating model that does not include public ownership, administration, or operations. Each respondent will consider the viability of the non-profit and privately owned models and propose accordingly.

8.4 Funding

System costs will include upfront capital and launch costs as well as on-going operating costs. Users paying to access the system or paying overage fees on trips that exceed the free-ride period will contribute a steady source of income for the program. User revenues will approach the cost of operating the system, but combined with upfront investments, the program will require an additional $3 million to launch and operate the system for its first five years (subsequent funding beyond Year 5 were not considered, but would be substantially less).

Many systems in the U.S. have used federal or state grants to fund bike share capital. These sources are generally exhausted in Cincinnati with funding being dedicated to the proposed streetcar line. Although grants should be considered for future expansion of the system, the most likely source of additional funding will come from station sponsorship. This can take a variety of forms ranging from an overall system sponsor to multiple smaller sponsors. The $3 million investment represents approximately $17,000 per station per year, which is not unreasonable compared to rates that other cities have been able to collect.

Potential fundraisers should explore the interest of the large number of Fortune 500 and Fortune 1000 companies headquartered in Cincinnati, the larger employers in the region, and the medical and health care campuses in Uptown. These institutions offer the potential for:

- Major sponsorship, e.g. Fortune 500 sponsorship of the system in Downtown / OTR or sponsorship of the Uptown system by a combined effort from the medical and health care providers (and the University of Cincinnati).

- Influx of large numbers of members by offering corporate membership programs as part of a Travel Demand or employee Health & Wellness package.

- Direct station purchase as a means of offsetting traffic impact or as a "good corporate citizen" contribution.

Although local public funding is not used in many other U.S. bike share systems, it does provide an encouragement to the private sector by showing that the public agency has "skin in the game." Some means of local public funding could include diversion of a portion of parking revenue, bus bike rack advertising, allocation of vehicle registration funds, application of Traffic Impact Fees to bike sharing, etc.

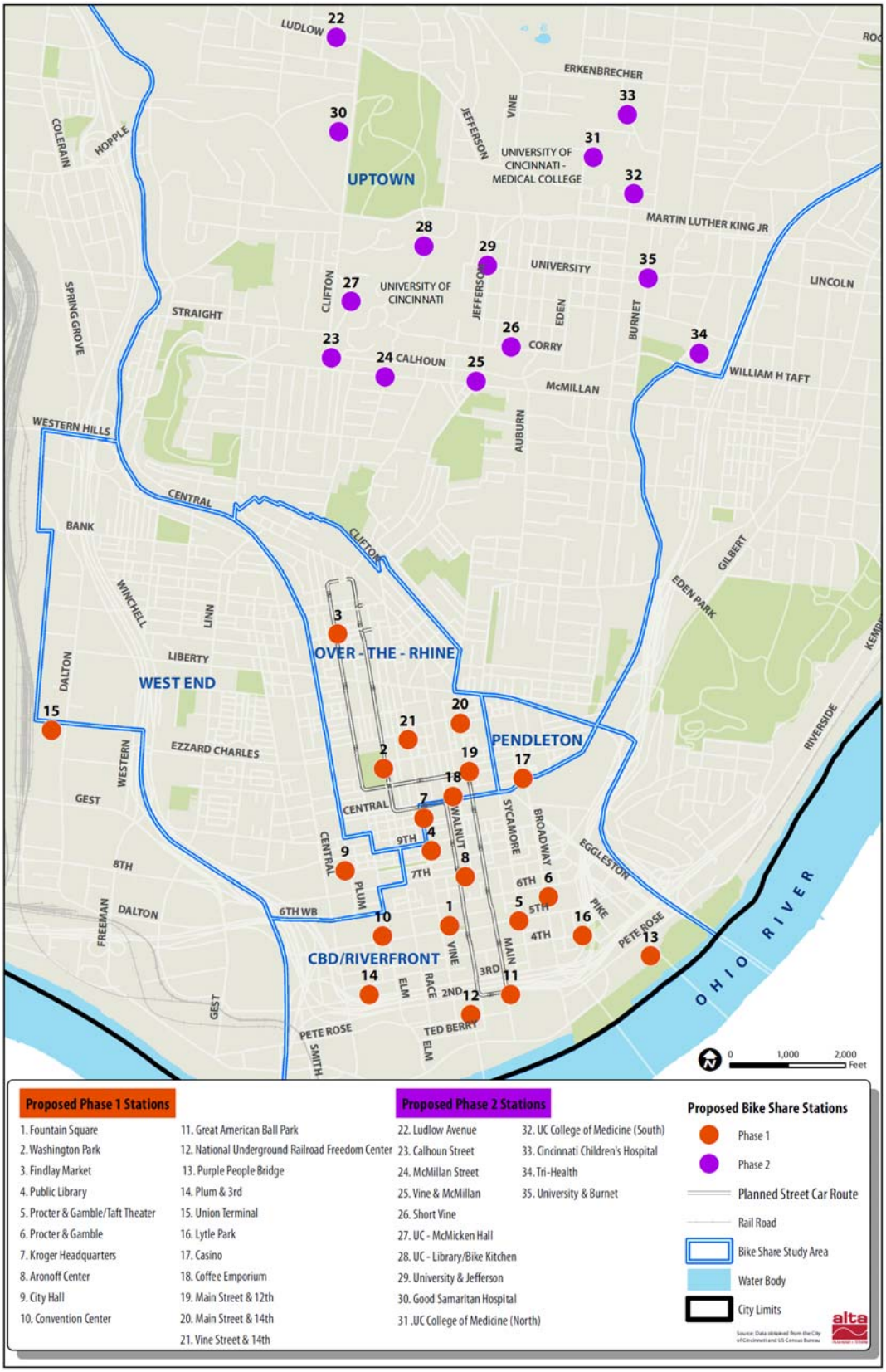

Figure 21 - Preliminary Station Plan