

2011

Recommendations for a Full-Scale Bike Sharing Program for Houston



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Executive Summary

In 2009, the EPA provided grant funding to the City of Houston as part of its Climate Showcase Communities program. One component of this grant was to develop bike share plan for the City of Houston . Bike sharing programs capture four main benefits:

1. Environmental benefits
2. Public health benefits
3. Economic benefits related to vibrant urban spaces
4. Revenues from memberships and trip fees

This bikeshare planning effort is consistent with other efforts the City of Houston is implementing to enable cycling as a viable transportation options. For example, the City of Houston is implementing a Comprehensive Bikeway Plan, which includes completing 280 miles of on-street bikeways and 20 miles of off-street bikeways, with a remaining 45 miles of planned and funded for shared-use paths. With its continuous expansion of the city's interconnected bikeway network, the City of Houston's Bikeways Program has made significant contributions to the state of biking in Houston. Under the direction of Dan Raine, this group, which is housed in the city's Public Works and Engineering Department, is a leader in providing Houstonians opportunities to learn how to ride safely on our city's streets.

This report sets forth recommended strategies for program expansion to three levels: "Satisfactory," "Excellent," and "Optimal." These levels were based on GIS modeling, which was used to identify potentially suitable locations for future bike share kiosks. The model evaluated criteria such as potential for pedestrian traffic /volume; density of employees and/or residents; proximity/access to public transportation; and proximity/access to existing biking infrastructure.

Based on the results of the modeling, the **Satisfactory** level roughly follows the Main Street Light Rail, covering areas between the downtown central business district south to the Texas Medical Center area. The **Excellent** level would expand in all directions from downtown to capture the Greater Third Ward, Northside Village, Montrose, University Place, and several other Super Neighborhoods. The **Optimal** level further expands to include most of Houston inside loop 610, plus Greater Uptown and Gulfton immediately outside the West Loop.

In addition to modeling ideal locations, the report also discusses ownership and maintenance strategies for the program. In nearly every bike share system that operates successfully in the U.S., ownership is by a non-profit organization, and a non-profit model of operation is recommended for Houston. There are many investments needed to achieve a successful bike sharing program. A bike share program has three primary costs:

1. Capital costs for the technology, which includes bicycles, docking stations, and kiosks.
2. Maintenance costs for bicycles, docking stations, and kiosks.
3. Operating costs for the entity established to maintain and operate the system.

Bike sharing bicycles are quite robust and resilient, requiring relatively few repairs on average (preventive maintenance notwithstanding). Because of this, maintenance costs are typically low as compared with the other two cost categories. However, capital and operating costs vary widely depending on the system. This study estimates that, for a system expansion to the Satisfactory level (780 bikes and 78 stations) capital costs will be approximately \$3,120,000. Capital costs for expansion to the Excellent level (2,640 bikes and 264 stations) will be approximately \$10,560,000. For expansion to the Optimal level (3,460 bikes and 346 stations), an estimate for capital costs is \$13,840,000.

The particular funding strategy that will ultimately work best for Houston's proposed bike share system is difficult to pre-determine. Like most other systems, grants and sponsorships will likely provide a critical share of the initial funding (one to three years of operation). Federal Transportation dollars are a potential source of funding. The Federal Highway Administration (FHWA) recently disbursed around \$25 million in funding as part of the federal Non-Motorized Pilot Program. Four cities received these funds to implement bicycling and pedestrian programs and projects. In addition, given the multitude of large corporations in Houston, corporate sponsorship is also an opportunity worth exploring. Experience in other localities suggests that a bike share system will achieve a minimal revenue stream during the first years of operation due in part to the high start up costs for equipment. None of the systems currently operating in the U.S. have yet become self-sustaining. A bike share program that strikes the optimal balance between number of bikes and stations, number of rides per day (which is related to the number of members), and pricing for the various membership levels can expect to become sustainable within three years.

Among the many lessons learned during the planning phase for the bike share demonstration program was the value of a well-orchestrated media and public relations strategy. Although there were limited resources available to implement a full-scale media plan, several small investments generated impressive returns. These basic strategies, which included a simple logo, a website (<http://bikeshare.harc.edu/Default.aspx>), a Facebook page (see www.facebook.com/houston.bikeshare), and representation at a few public events, were useful in generating public interest and in creating a "buzz" surrounding bike share. The following six activities have been identified as essential to an effective public relations strategy. In order to create a strong market for the bike share program, these activities should be implemented early on.

1. Develop logo, mission statement, and boilerplate
2. Improve web presence
3. Expand social media strategies
4. Coordinate outreach with partners and supporters
5. Issue press release
6. Host kick-off event

The recommendations in this report are the result of an intensive fifteen month research and planning process, during which a stakeholder group was formed, a public engagement process was implemented, and exploratory visits to other bike sharing programs around the U.S. were made. Thanks to a stakeholder group and research team with an acute understanding of the local market, as well as efforts

to earnestly engage with the public and solicit feedback, the proposed strategies are tailored to meet the needs and suit the preferences of Houston's unique market.

Introduction

In 2009, the EPA honored the City of Houston by awarding it a prestigious Climate Showcase Communities Grant. One component of this grant was to develop a Houston bike share demonstration program. With funds from the Climate Showcase grant, three next generation bike sharing stations are being purchased and installed in the downtown area to serve as a technology “showcase.”

A second component of the Climate Showcase grant is the development of a plan for expanding to a full scale bike sharing program. This report sets forth recommended strategies for program expansion to three levels: “Satisfactory,” “Excellent,” and “Optimal.” These levels were based on GIS modeling, which was used to identify potentially suitable locations for future bike share kiosks. The model evaluated criteria such as potential for pedestrian traffic /volume; density of employees and/or residents; proximity/access to public transportation; and proximity/access to existing biking infrastructure.

The intent of this document is to detail a path forward for implementation of a full-scale bike sharing program in Houston as future funds are identified and secured. The recommendations put forth in this report are the result of an intensive fifteen month research and planning process, during which a stakeholder group was formed, a public engagement process was implemented, and exploratory visits to other bike sharing programs around the U.S. were made. Thanks to a stakeholder group and research team with an acute understanding of the local market, as well as efforts to earnestly engage with the public and solicit feedback, the proposed strategies are tailored to meet the needs and suit the preferences of Houston’s unique market.

This report makes recommendations for critical components of a bike share program, including addressing maintenance and operations issues, identifying funding strategies, and recommending station locations for the three expansion levels. In addition, the research and planning phase for the demonstration program provided an ideal testing ground for the planning phase that will precede the launch of the full-scale bike share program. Among the many lessons learned was the value of a robust media and public relations plan. An endeavor, such as a municipal bike sharing program, that relies on strong public participation to maximize its benefits must actively and creatively engage the public. To this end, a media strategy has been laid out, which includes an efficient six point plan, as well as templates for media materials, such as a fact sheet and a press release.

Finally, and perhaps most importantly, a functional bike share program with strong public buy-in will hinge on policies that not only enable, but empower bicycling as a safe and convenient recreational and commute option. The average bike share user in Houston will likely be a novice to intermediate level cyclist with limited experience biking along urban rights of way. Houston’s bike share program will benefit from well-rounded policies that improve biking infrastructure and allocate the funds to do so, that incentivize biking for its health, financial, environmental, and recreational benefits, and that encourage safe, convenient, and equitable biking opportunities across the city. The final section of this

report outlines just such a policy strategy. Guided by best practices from other supportive biking cities, such as Portland, Oregon, the Policy, Support, and Public Education component is the foundation for a thriving bike share program for Houston.

The diagram in Figure 1 frames this report. It offers a visual representation of the report's premise: a sustainable bike share program – with major components of maintenance and operations, funding strategy, and station site selection – that is functionally used by a large share of the public will balance carefully on strong and supportive biking policies coupled with a public that is well-informed and safety-minded with regards to bicycle commuting. A strong media strategy is crucial to conveying each of these key components.

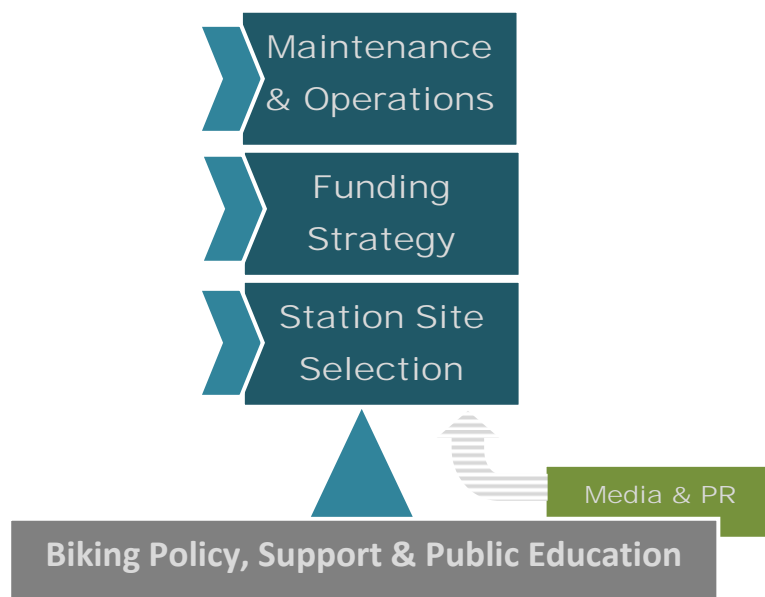


Figure 1: Diagram of Report Lay Out: Bike Share Program Balances on Strong Biking Policy

Why Bike Sharing?

What are the benefits of bike sharing to a large, metropolitan city, such as Houston? Do these benefits outweigh the costs? Bike sharing programs capture four main benefits:

1. Environmental benefits
2. Public health benefits
3. Economic benefits related to vibrant urban spaces
4. Revenues from memberships and trip fees

Environmental Benefits

The environmental benefits of bike sharing derive from the replacement of vehicle trips. These trips are major sources of air pollution and include emissions that contribute to ozone formation (VOCs and NO_x), carbon monoxide (CO), and greenhouse gas emissions, such as carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). Such emissions are of particular concern in dense urban areas, where motor vehicles are the primary source of air pollution. The challenge to urban air quality is not simply the reduction of vehicle miles traveled (VMT). Short trips, such as those replaced by bike share trips, generate much higher levels of emissions per mile than longer trips.¹ An emissions profile for an automobile trip shows emissions peaking during the first two to three miles of a trip. This is because vehicular emissions occur at a much higher rate when the vehicle is warming up.¹ This makes bike sharing a powerful “green” investment for a dense urban area, one that can increase air quality and improve health. If bike sharing replaces a significant portion of short vehicle trips with bike share trips, the potential exists to significantly reduce local harmful air pollutants.

Such reductions only occur if bike share trips replace what would otherwise be vehicular trips. In other words, if a city’s bike sharing program does not evolve past recreational use (trips that wouldn’t be made in the absence of bike sharing), then emissions saving benefits will not be realized. This is part of what motivates the need for careful planning with station placement within three blocks of critical “nodes,” places where users are most likely to come and go. In general, bike share stations should be placed in areas that:

- optimize use of mass transit (stations located near bus stops and rail stations),
- facilitate use at major employment centers (stations in proximity to office buildings and colleges/universities)
- capture all other potential user markets (stations near residential, retail, recreational and tourist centers)

Beyond good planning that enables functional use, the key to a bike sharing program that eventually generates real environmental benefits is a large station inventory and high usage rates. A bike share

¹ Emissions from simply starting a vehicle are: NO_x - 11% of all motor vehicle emissions, 32% of VOC emissions, and 29% of CO (Houston region; 2006, TCEQ, MOBILE6).

system needs lots of users that drive the expansion toward more bikes and stations, which in turn replace car trips, and eliminate tons of harmful emissions.

For example, studies have estimated that large and well used bike share programs eliminate thousands of metric tons of carbon per year. With 420 stations and 6,000 bikes (Petzold, 2011), Barcelona's Bicing system is estimated to eliminate 9,000 metric tons of CO₂ per year (New Study Examines Health and Environmental Benefits of Bike Sharing, 2011). These benefits are achievable not only because of the tremendous number of bikes and stations in the Bicing network, but also consider that the program has more than 180,000 members – nearly 11% of the population of Barcelona is a registered bike share user! (Stone, 2011)

By comparison, the 3,460 bike system envisioned for Houston² would achieve a reduction of 1,667 metric tons (3,675,106 lbs) of CO₂ per year.³ For the bike sharing demonstration program, which includes eighteen bikes, annual carbon offsets are estimated to be about 8 metric tons (17,600 lbs) per year. Note that in the table in Appendix A the estimate for average trips per bike per day for Houston's system is three. This is based on the average for other U.S. bike share cities that have been in operation for more than a year, such as Denver, which currently averages around 1,000 rides per day, or two rides per bike per day (Turner, 2011). In general, North American bike share programs average between less than one and five rides per bike per day. This number has been shown to increase over time as the system grows (more bikes and stations are added) and membership increases. The Barcelona Bicing system has been able to achieve very high rates of annual carbon offsets because of a higher number of trips per day per bike (around 16), as compared to systems in the U.S.⁴ (Petzold, 2011).

An additional note is needed regarding estimates for CO₂ reductions attributable to bike share. Most estimates do not account for bike "rebalancing," including those generated by this study for Houston's proposed system. Bike rebalancing is the process that must be carried out in order to redistribute bikes between stations, since at certain times of the day the majority of the bikes will be concentrated in certain areas, leaving other stations empty. A truck and trailer, and often several trucks and trailers, are typically used to rebalance the bikes between stations. This process generates significant amounts of CO₂ and other harmful pollutants, which will offset some of the reductions generated by bike sharing. A "green" alternative is to use a bicycle-hauled trailer, but this is not practical for very large systems spread out over sizeable areas.

Public Health Benefits

The public health and economic benefits generated by bike sharing programs have not been carefully reviewed as of yet. A recent study of Barcelona's Bicing system showed that the health benefits of using the system outweighed the risks by a ratio of 77 to one (New Study Examines Health and Environmental Benefits of Bike Sharing, 2011). Beyond that, there are numerous anecdotes of bike share users

² Assuming expansion to the Optimal level.

³ Appendix A provides estimates for the potential carbon offset for a range of system sizes, where system size is represented by the number of bikes.

⁴ Six-thousand Bicing bikes are used for about 100,000 trips per day, or slightly more than 16 rides per bike per day

achieving weight loss goals and improving their overall health by using bike share as a commute alternative.

Decades of research have shown that increased levels of physical activity produce significant health benefits. As discussed, bike share enables people to replace short trips that they may have otherwise made with their vehicle. This generates co-benefits for the environment and one's health. A second outcome, which is more often the case with bike share programs in the first few years of operations, is that bike share enables people to make non-vehicular trips that they otherwise would not have made. For many users, bike share will present convenient opportunities for increased physical activity. It can meet the needs of people who would not normally be as active as the average "cyclist" and possibly attract users that a traditional bicycle would not.

Economic Benefits

That bike sharing programs drive economic benefits, at least indirectly, is supported by evidence from other cities' programs. Forty-one percent of Denver bike share users report using bike share bikes to run errands (and spend money) at least twice a week (Denver Bike Sharing, 2010). This suggests that local businesses, and by extension, the local economy, benefit from the frequent and functional use of bike share.

Below is a list of other potential benefits of bike sharing.

- Bike sharing supports a healthy public by giving people a healthier transportation choice.
- Since bike sharing stations can, and should, be deployed near transit stations, bike sharing maximizes a city's public investment in mass transit because it provides a complement to bus and rail systems.
- Bike sharing contributes to an active, vibrant urban core. It can spur economic development by increasing access to retail outlets and other businesses, by providing tourist incentives, and by attracting new businesses who want to locate near popular stations.
- Bike share systems provide a visible, affirmative expression of an energetic and livable city that supports bicycling, and by extension, other investments in sustaining quality of life.
- Bike sharing encourages all forms of alternative transportation – walking, transit riding, and cycling alike.

Maintenance & Operations

Who Owns a Bike Share System?

In nearly every bike share system that operates successfully in the U.S., ownership is by a non-profit organization. In many cases, a non-profit organization is established for the sole purpose of housing the bike share program. San Antonio, Denver, Minneapolis, and several other cities have followed this model. Denver Bike Sharing is a 501(c)3 established at the behest of the mayor to implement the city's bike sharing program. San Antonio Bike Share was established under similar conditions. Minneapolis's Nice Ride Minnesota, which operates bike sharing in the Twin Cities, is a non-profit established through a collaborative effort between the City of Minneapolis and a local foundation.

In other cities, the capacity of existing non-profit organizations whose missions pertain to biking or public health is expanded to house the local program. For example, Partners for Active Living, a non-profit in Spartanburg, South Carolina, applied for grants to start a bike sharing program in their town. Des Moines, Iowa, has followed a similar model with their small four-station system. The Des Moines Bicycle Collective, a well-established non-profit, pursued grant funds and corporate sponsorships to launch their program.

A second for-profit model of bike sharing operation also exists, whereby large advertising corporations own and operate a bike sharing system, in exchange for advertising rights on the bikes and stations. This model has been widely popular in the European and Latin American markets, but it has not had as much success in the U.S. Washington D.C.'s SmartBikes was a for-profit enterprise of Clear Channel Inc's Adshel, an outdoor advertising and street furniture company. Clear Channel administered the project and shared a portion of advertising revenues with the city, in exchange for an exclusive contract to advertise on bike share equipment. This system was replaced by the much larger, publicly-funded system, called Capital Bikeshare in 2010. Clear Channel, J.C. Decaux, and other advertising companies continue to have success with the for-profit model in dozens of international cities' bike sharing programs, including Paris, Barcelona, and Stockholm. New York City's upcoming bike share program will be implemented as a for-profit enterprise. With plans to deploy more than ten thousand bikes, this system is expected to be profitable within the first year. As the first of its kind in the U.S., this is one that should be watched closely.

For Houston, a non-profit model of operation is recommended. This is the model being successfully used by most other U.S. cities, and reflects the experience and planning from these efforts. There are at least two local biking non-profits that can be considered for adopting the program, one of which has been closely involved in the planning efforts. Within this model, the implementing non-profit could "spin off" a separate non-profit to maintain and operate the system. This option conveys the bike sharing program knowledge and networks pertaining to non-profit management and to biking, but indemnifies the existing non-profit from the uncertainties of launching a new program.

What Are the Costs to Start, Maintain, and Operate a Bike Share System?

So-called “third generation” bike sharing systems are costly. Furthermore, over the short term of two years, U.S. systems have not proven to be profitable. Since there are only a few examples of U.S. systems that have been operating for more than two years – considered a reasonable timeframe after which to expect investment returns in the bike sharing business world – it is premature to evaluate the profitability of bike sharing as a business model. Most U.S. systems have seen only small revenue streams from user fees and memberships during the first two years of operation. Income is unlikely to be sufficient to sustain or render these systems profitable until the number of bicycles and stations expands beyond a critical point. Like any business requiring substantial upfront capital expenditures and an untested revenue experience, this critical point is different for every system. The system must be adequately sized such that a suitable revenue stream can be generated with surplus to continue investing in program expansion. The system must also strike a balance between pricing of memberships and trip fees that achieves adequate levels of use to cover costs of system operations.

Bike sharing advocates are quick to point out that the real benefits of a robust bike sharing system are not direct financial gain, but environmental benefits associated with reducing harmful air emissions, achieving fewer vehicular miles travelled, and health benefits attributable to a more active population. These and other positive impacts of bike sharing have been discussed in an earlier section of this report.

There are many investments needed to achieve a successful bike sharing program. The average system takes fifteen months of planning, which implies many hours of volunteer time, in-kind donations, and other investments. A bike share program of any size implies three unavoidable costs:

4. Capital costs for the technology, which includes bicycles, docking stations, and kiosks.
5. Maintenance costs for bicycles, docking stations, and kiosks.
6. Operating costs for the entity established to maintain and operate the system.

Depending on the size of the system (e.g. the number of bikes and stations) each of these costs will comprise a different share of the overall system cost. Bike sharing bicycles are quite robust and resilient, requiring relatively few repairs on average (preventive maintenance notwithstanding). Because of this, maintenance costs are typically low as compared with the other two cost categories. However, capital and operating costs vary widely depending on the system. They may also rise dramatically as a system expands, for example the cost of increasing the number of full-time bike technicians as more stations and bicycles are incorporated to serve a wider area, or the cost of hiring a membership coordinator as memberships increase.

Capital Costs

From research conducted during this project, a reasonable cost estimate for a next-generation bike sharing bicycle is \$1,000, but the kiosks and docking stations add significantly to a system’s overall capital costs. There are various technology options for bike share stations, including solar or AC power and mobile set up versus fixed installation. In addition, each station can accommodate a different number of bikes. These variables affect the average unit cost of a bike share station. Consequently,

capital equipment costs do not necessarily rise in direct proportion to the number of bikes. For purposes of comparison, Table 1 shows several systems and their associated equipment costs.

Table 1: Approximate Capital Costs for Systems of Various Sizes

	No. of Bikes	No. of Stations	Equipment Cost
Houston (Demo)	18	3	\$98,408
San Antonio	140	14	\$650,000
Minneapolis	700	65	\$3,000,000

Based on other cities' capital costs and assuming an average cost per kiosk of \$30,000⁵, this study estimates that, for a system expansion to the Satisfactory level with 780 bikes⁶ and 78 stations capital costs will be approximately \$3,120,000. Capital costs for expansion to the Excellent level with 2,640 bikes and 264 stations will be approximately \$10,560,000. For expansion to the Optimal level with 3,460 bikes and 346 stations, an estimate for capital costs is \$13,840,000.

Table 2: Estimated Capital Costs for Houston's Proposed Bike Share System Expansion

	No. of Bikes	No. of Stations	Equipment Cost
Satisfactory	780	78	\$3,120,000
Excellent	2,640	264	\$10,560,000
Optimal	3,460	346	\$13,840,000

Maintenance Costs

Major bike share technology vendor, B-Cycle, estimates that per bike maintenance costs range between \$25 and \$100 per year. For each bike, many of the first year maintenance costs are covered under the warranty; so first year bicycle maintenance costs are expected to be lower than subsequent years. There are also maintenance costs for the kiosks, which are normally covered under a separate contract with a local company. Based on vendor information and experience, estimates for kiosk maintenance are around \$1,050 per year per kiosk^{7,8}. Table 3 shows estimated maintenance costs for bike share systems of various numbers of bikes. Rows containing the numbers of bikes and stations in the proposed

⁵ This is an estimate based on available data for equipment costs from the three cities in Table 1. The unit price for a kiosk varies widely.

⁶ For the purposes of this report, an average of ten bikes per station is assumed. Bike share stations can dock a wide range of numbers of bikes – from three or four to several dozen. An assumption of ten bikes per station greatly simplifies planning and is a typical average for many bike share systems across the U.S. Both Denver and San Antonio's bike share system inventory maintain roughly a ten to one bicycle to station ratio.

⁷ Assumes standard one kiosk per station.

⁸ The amount for annual kiosk maintenance varies widely across systems and depends on multiple factors, such as strength of a wireless signal in the area. The kiosk is essentially a computer with a user interface (touch screen), so technology issues will be similar in scope and frequency as with the average computer. For this report, an estimate of \$1,050 per year for kiosk maintenance costs has been assumed. This is based on \$175 per hour for service technician site visit multiplied by an average of 6 hours per year per kiosk.

expansion levels – Satisfactory, Excellent, and Optimal – have been highlighted gray. An average maintenance cost of \$65 per bike per year has been assumed for the purposes of this report.

Table 3: Estimated Annual Maintenance Costs for Systems of Various Sizes

No. of Bikes	No. of Stations	Maintenance Cost for Bikes	Maintenance Cost per Kiosk	Maintenance Total
18	3	1,170	3,150	\$4,320
50	7	3,250	7,350	\$10,600
100	10	6,500	10,500	\$17,000
250	25	16,250	26,250	\$42,500
500	50	32,500	52,500	\$85,000
780	78	50,700	81,900	\$132,600
1,000	100	65,000	105,000	\$170,000
1,500	150	97,500	157,500	\$255,000
2,640	264	171,600	277,200	\$448,800
3,460	346	224,900	363,300	\$588,200
5,000	500	325,000	525,000	\$850,000

Maintenance contracts for most non-profit bike sharing operations in the U.S. are carried out either in-house, or through a partnership with a local bike shop. For instance, Denver Bike Sharing employs a staff of eight bike mechanics to service and maintain their fleet. In contrast, San Antonio Bike Share partners with local bike shop, Bike World for bike maintenance.

Due to strong support for Houston’s bike sharing initiative during the demonstration project planning phase, it is recommended that bike maintenance be carried out through a separate contract with a local bike shop. This will reduce the bike share non-profit’s operating costs by eliminating the need for an in-house full-service bike repair shop and staff, and will allow the bike share operator to focus more fully on system operation tasks.

Operating Costs

Operating costs for a bike sharing system have been shown to be sizeable and to vary greatly across systems, depending on system size and the number of members. When considering operating costs for a bike sharing program, a reasonable comparison would be the cost to operate any similarly sized non-profit that has a large membership base and includes a significant technology element with notable capital costs. Examples might be a drop off/delivery food co-op with a subscriber web interface, a non-profit transportation provider, or a public library with online check-outs.

There are different methods for managing operations for bikeshare systems. For Washington DC’s Capital Bikeshare and Boston’s Hubway, which are operated by the for-profit bike share planning firm, Alta Bicycle Share, who partnered with Public Bike System Co., to operate the systems. Conversely, B-Cycle, currently supplies the majority of U.S. bike sharing technology, including the systems in Denver, San Antonio, Des Moines, Spartanburg, Chicago, Boulder, and others. Under their current model, B-Cycle does not include management and operations of the bike share system in the contract for their bike

share equipment. This is one of the reasons it can be useful to establish a non-profit, in addition to fundraising, the main function of the non-profit is to manage day-to-day operations of the bike sharing system.

As with capital costs, there are many variables that affect the cost of operations. In their feasibility study for a bike sharing system, Portland's Bureau of Transportation calculates that a reasonable estimate for yearly operating costs is between \$1,250 and \$2,300 per bike (Portland Bureau of Transportation). Based on this estimate, a useful range for the cost to operate each of Houston's proposed bike sharing expansion levels is provided in Table 4.

Table 4: Estimated Annual Operating Costs for Houston's Proposed Bike Share System Expansion

	No. of Bikes	No. of Stations	Operating Cost Range	
			(Low)	(High)
Satisfactory	780	78	\$975,000	\$1,794,000
Excellent	2,640	264	\$3,300,000	\$6,072,000
Optimal	3,460	346	\$4,325,000	\$7,958,000

Funding Strategy

In most U.S. cities where bike sharing has been implemented, the organizational model that has proven most feasible is non-profit ownership. This creates the opportunity to enlist different funding strategies, such as corporate sponsorships and foundation and government grants, which would not be practical in coordination with a for-profit operation. A varied funding mix can ensure financial viability for bike sharing programs, which take at least two years to become self-sustaining⁹. In most U.S. bike sharing cities, initial investment costs are via state or federal grants. Other cities have benefitted from corporate sponsorships that made the initial capital investment. Still other cities, such as Denver, started their bike share programs with residual funds from completed city projects. Ongoing operating costs are then covered by a variety of funding strategies, including additional grants, advertising rights on bikes and at stations, corporate sponsorships of stations and other donations, including in-kind, and revenues from bike sharing membership and use fees.

The particular funding mix varies by city. Expenses also vary significantly, depending on the size of the fleet and the program's plans for expansion. The following sections provide a description of the different funding strategies that have been implemented in U.S. cities where bike sharing programs are successfully operating.

Minneapolis: 1200 Bikes/116 Stations

Bike sharing in Minneapolis is operated by a 501(c)3 non-profit organization, called Nice Ride Minnesota. Nice Ride chose Public Bike System Co. to supply their bike share equipment and technology. (Public Bike System Co. developed Montreal's Bixi bike share system - one of North America's earliest and most successful bike share programs.) The system planning, including recommendations for station locations was supported by Alta Planning.

Nice Ride funds the bike share program with investments from four major sources.

1. Private Contributions
2. Public Funds
3. Station sponsorships
4. Bike share subscriptions and trip fees

Capital start-up costs for Nice Ride were funded through a public-private partnership between Blue Cross and Blue Shield of Minnesota and a local initiative, called Bike Walk Twin Cities. Blue Cross and Blue Shield, the single largest private donor, contributed significant funds from an historic tobacco litigation settlement. Responding to this major funding commitment, Bike Walk Twin Cities stepped up

⁹ Amount of time to become profitable depends on several factors, including numbers of bike share stations, users, and members, and pricing of membership fees and trip fees. Systems that expand rapidly generally take longer to become self-sustaining or profitable.

to invest public funds, primarily through the Federal Highway Administration’s Nonmotorized Transportation Pilot funds (Nice Ride Minnesota: Our Story).

Operational costs for Nice Ride Minnesota are funded through subscriptions and station sponsorships. Sponsors receive advertising opportunities on a kiosk, on the Nice Ride website, maps and other printed materials. Nice Ride has a list of more than twenty-five sponsors. Below is a list that includes those that could be instructive to Houston’s bike share planning (Sponsorship Makes Nice Ride Possible).

Shortlist of Nice Ride Minneapolis Sponsors

Target
Aveda
Freewheel Bike Shop
U.S. Bank
Xcel Energy
Local colleges and universities

Subscriptions and trip fees are the fourth funding source for Minneapolis’ bike share program. The table below shows membership subscription rates and the cost for trips longer than the free-ride time per trip of 30 minutes¹⁰.

Table 5: Minneapolis Nice Ride Subscription Rates and Trip Fees

Subscriptions		Trip Fees	
24 hour	\$5.00	0-30 min	FREE
30 day	\$30.00	up to 60 min	\$1.50
1 year	\$60.00	up to 90 min	\$4.50
Student 1 year	\$50.00	Each addl half hour	+\$6.00

Denver: 510 Bikes/51 Stations

There are currently two major competitors in the “next generation” bike sharing technology market. (Other companies are developing technologies, which may enter the market soon.) As mentioned, Public Bike System Co. designed and supplied the equipment for Minneapolis’ system. In contrast, Denver Bike Sharing, the non-profit that operates bike share, selected B-Cycle to supply their equipment. B-Cycle is a subsidiary of Trek, and is currently gaining a strong foothold in the U.S. bike share market. Nearly all of the cities that have launched bike share programs in the past two years in the U.S., with the notable exceptions of Boston, Washington D.C., and New York’s upcoming system, have chosen the B-Cycle product.

¹⁰ Returning (or “re-docking”) a bike before the end of the 30 minute free ride time restarts the user’s clock. They can then check out another bike and start again with another free 30 minute ride. This could continue indefinitely during bike share operating hours, so that a user never pays more than their initial subscription fee (i.e. the user would never pay a trip fee with this strategy).

Though Denver and Minneapolis selected different technology suppliers, their programs have very comparable financing structures. Much like Minneapolis' Nice Ride, Denver Bike Sharing relies on a diverse mix of funding sources. In fact, the funding sources are effectively the same for the two cities, though they are called different names and used to fund different aspects of the program. As in Minneapolis, Denver's four funding sources are:

1. Foundation grants
2. Government grants
3. Corporate (station) sponsorships
4. User memberships and transaction fees

Another similarity between the two cities' funding structures is that Denver's bike sharing program benefitted from a very large initial investment. In Denver's case, the initial start up costs for the bike share program came from surplus funds remaining from the Democratic National Convention, which was held in Denver in 2008. After a long research and planning process, the Denver 2008 Convention Host Committee donated \$1 million dollars of convention surplus funds, effectively launching Denver's bike share program (The Denver Bike Sharing Story, 2009). In a similar way, Minneapolis benefitted from the large initial donation from Blue Cross and Blue Shield. Most bike share programs are initiated by a single large investment. The significant capital costs required to launch a full-scale bike share program necessitate a large financial investment at start-up.

Denver Bike Sharing has actively pursued grants to fund bike sharing equipment and operations. The organization has a department whose primary role is to develop grant proposals for additional bike share funding. To provide examples of the types of private and public grants that have been used to support bike sharing, below is a short list of foundation and government agencies that have awarded grants to Denver Bike Sharing.

Denver Bike Sharing Foundation and Government Grants

Walton Family Foundation

Anschutz Foundation

Gates Family Foundation

Department of Energy (DOE) Energy Efficiency and Conservation Block Grant (EECBG)

Both Minneapolis and Denver's bike share systems offer sponsorship opportunities to corporations and other entities that are interested in supporting these types of programs, in exchange for public recognition and advertising rights. Denver Bike Sharing's website clearly outlines their sponsorship structure. Interested organizations can sponsor the bike sharing program for either one year (\$30,000) or three years (\$20,000 per year). In return, sponsors are given the following incentives (Denver Bike Sharing Sponsorship, 2010):

- Sponsored bike station at desired available location.
- Prominent company logo placement on a station kiosk.
- 10 branded bikes with company logo placed on baskets circulating throughout the system.
- Listing and links on the Denver Bike Sharing website

- Placement and links in member e-newsletters.

In addition to station sponsors, Denver Bike Sharing offers local companies the opportunity to be business sponsors. Bike sharing members (users) who purchase annual memberships can use their bike share “B-card” (bike share pass) at sponsoring businesses to redeem discounts and specials. In exchange, Denver Bike Sharing guarantees the following to its business sponsors (Denver Bike Sharing Sponsorship, 2010):

- Promotion of the business and offer on Denver Bike Sharing’s Facebook page and Twitter monthly in the first quarter of participation; every other month thereafter.
- Live link on the Denver B-cycle Web site.
- Denver B-cycle Business Supporter sticker for placement on front window.
- Inclusion (business and offer) in monthly newsletters.
- Program information about bike sharing provided to the business and its staff, including B-cycle maps and membership rate information.

Finally, bike sharing is supported by members’ subscriptions and trip fees. Although this fourth category comprises the smallest share of bike share funding – grants and sponsorships are significantly larger – the share of membership fees with respect to other funding sources is growing as the system expands and more users join. As a comparison to Minneapolis’ usage fees, Denver’s subscription, or membership fees and additional trip fees are listed below.

Table 6: Denver Bike Sharing Subscription Rates and Trip Fees

Subscriptions		Trip Fees	
24 hour	\$6.00	0-30 min	FREE
7 day	\$20.00	up to 60 min	\$1.00
30 day	\$30.00	Each addl half hour	+\$4.00
1 year	\$65.00		
Student/Senior 1 year	\$45.00		

San Antonio: 140 Bikes/14 Stations

Currently, San Antonio operates the only full-scale “next generation” bike share program in the State of Texas, although programs are being considered by several other cities, including Austin and Fort Worth. A non-profit organization called San Antonio Bike Share administers the city’s medium-sized bike share system. A phase 2 expansion is already scheduled, with funding secured. San Antonio’s system received initial start-up funds from two large grants, one from the Centers for Disease Control and Prevention (CDC) and a second from the Department of Energy’s Energy Efficiency Conservation Block Grant (EECBG) (Davila, 2011). This is the same grant that partially funds Denver’s program. The two grants totaled about \$850,000 and were primarily used to cover the cost of the bike share equipment (LeBlanc, 2011). San Antonio’s bike share technology is supplied by B-Cycle.

San Antonio's bike share system was launched in the spring of 2011. Station sponsors are being sought to support the program financially, but very little information was available pertaining to sponsors at the time of this report. San Antonio Bike Share's website provides a list of at least ten sponsors that have donated to the project since its beginning. The list includes a wide variety of local business from law firms, to local breweries, to bike shops and building contractors.

As with other bike share systems detailed here, another source of funding for San Antonio's system is from subscriptions and trip fees. For the purpose of comparison, San Antonio's membership rates and usage fees are listed below.

Table 7: San Antonio Bike Share Subscription Rates and Trip Fees

Subscriptions		Trip Fees	
24 hour	\$10.00	0-30 min	FREE
7 day	\$24.00	Each addl half hour	+\$2.00
1 year	\$60.00		
Student/Senior 1 year	\$48.00		

Table 8 presents a side-by-side comparison of subscription prices and trip fees for the three municipal programs discussed above: Minneapolis, Denver, and San Antonio. Note that each bike share program has considerable flexibility in specifying their particular rates and fees.

Table 8: A Comparison of Subscription and Trip Fees for Three Bike Sharing Programs (Minneapolis, Denver, and San Antonio)

Subscriptions				Trip Fees			
	Minneapolis	Denver	San Antonio		Minneapolis	Denver	San Antonio
24 hour	\$5.00	\$6.00	\$10.00	0-30 min	FREE	FREE	FREE
7 day	--	\$20.00	\$24.00	up to 60 min	\$1.50	\$1.00	
30 day	\$30.00	\$30.00	--	up to 90 min	\$4.50		
1 year	\$60.00	\$65.00	\$60.00	Each addl half hour	\$6.00	\$4.00	\$2.00
Student/Senior 1 year	\$50.00	\$45.00	\$48.00				

Recommendations for Houston's Funding Strategies

The particular funding strategy that will ultimately work best for Houston's proposed bike share system is difficult to pre-determine. Like most other systems, grants will likely provide a critical share of the system funding, especially in the initial phases, from planning through the first one to three years of operation.

Grants and Sponsorships

Federal Transportation dollars are a potential source of funding. The Federal Highway Administration (FHWA) recently disbursed around \$25 million in funding as part of the federal Non-Motorized Pilot Program. Four cities received these funds to implement innovative bicycling and pedestrian programs and projects to see how these non-motorized transportation modes improved after 4 years. If this well-

funded program is any indication, the horizon seems bright for federal allocations to projects like bike share that advance biking and “greener” transportation.

Given the multitude of large corporations in Houston, corporate sponsorship would seem to be an opportunity worth exploring. As compared to other bike sharing cities, such as San Antonio, Denver, or Spartanburg, Houston has far more major companies, many of which are headquartered here, which may have public relations and shareholder incentives to contribute to a non-controversial environmentally sensitive program with a vast public reach.

Subscription Rates and Trip Fees

Experience to date suggests that a bike share system will achieve a minimal revenue stream during the first years of operation due in part to the high start up costs for equipment. None of the systems currently operating in the U.S. have yet become self-sustaining, though Washington DC’s Capital Bikeshare is expected to cover its operating and maintenance costs through bike share revenues (subscriptions and trip fees) by the end of 2011 (C., 2011). Parry Burnap, Executive Director of Denver Bike Share, projects financial sustainability for her city’s system within the next two years (Maher, 2010). San Antonio has given similar projections for its system. A bike share program that strikes the optimal balance between number of bikes and stations, number of rides per day (which is related to the number of members), and pricing for the various membership levels can expect to become sustainable within three years.

For Houston’s proposed bike share system, Table 9 lays out the recommended pricing schedule for subscriptions and trip fees. These prices are consistent with those of other U.S. bike share programs, as reflected in Table 8, which compares subscription rates and trips fees for three different bike sharing systems. For Houston, a higher subscription fee of \$10 for a 24-hour day pass is recommended (the same as San Antonio charges for a 24-hour pass). Other cities are typically charging \$5 to \$7 for a day pass. This recommendation is being made upon a review of other cities’ statistics, which show that a majority of subscriptions, especially in the first two years of operation, are 24-hour subscriptions made at the kiosk. Setting a higher price for a day pass will capitalize on this trend. Additionally, a \$10 day pass rate will allow Houston’s sizeable convention and tourist market to subsidize local users.

It is also recommended for Houston’s pricing strategy that the first hour be free, instead of the first thirty minutes, which is more common across bike sharing programs. This is recommended during the bike share demonstration phase, but also under the three expansion scenarios, due to the vast area (in terms of square miles) that defines the system boundary in all of the scenarios. Unlike most bike share cities, such as Denver, Minneapolis, and Chicago, Houston is not characterized by a uniformly dense urban center. Since Houston’s bike share system will, by necessity, connect multiple urban centers (downtown, Medical Center, Greenway Plaza, Uptown, etc.) stations would not be spaced as densely as in other cities with a tighter network of locations. This would be cost prohibitive, requiring potentially thousands of stations. Furthermore, to create a dense network of stations across the entire proposed

area, many of the stations would be located at sub-prime sites, such as along large median divided boulevards with no businesses or other landmarks, or in single family residential neighborhoods.

A good example of this dilemma is the location options for a station between downtown and the University of Houston. While it is important to capture the potential high user market at a major university, such as U of H, there are scarce locations that would be suitable for a bike share station along the various routes connecting U of H with other neighborhoods to the west. Ultimately, a bike share user trying to commute between U of H and, for example, the Museum District will use a combination of streets and public transportation (bus and/or rail). Alternatively, they might use a combination of streets and the Columbia Tap Trail. In either case, they are not likely to pass many other stations (or places where stations could potentially be located) where they can re-dock their bike and check out another one, thus avoiding trip overages. This trip is roughly 4.5 miles and would not be easily made in less than thirty minutes by the average bike share user, especially once you account for time spent waiting at intersections or at bus stops. Therefore, an extension to a 60-minute free ride zone is recommended.

Table 9: Recommended Subscription Pricing and Trip Overage Fees for Houston Bike Share Program

Subscriptions		Trip Fees	
24 hour day pass	\$10.00	0 – 60 min	FREE
7 day	\$20.00	60 min – 2 hours	\$2.00
30 day	\$30.00	Each addl half hour	+\$4.00
1 year	\$65.00	Max. per day	\$80.00
Student/Senior 1 year	\$45.00	More than 24 hours	\$1,000.00*

*Bike replacement fee. Bikes missing for more than 24 hours are considered stolen.

Appendix B estimates bike share revenues across a range of scenarios, assuming the pricing schedule laid out above. The share of various membership levels (annual versus short-term) was estimated based on other cities' membership statistics. Potential income from subscriptions varies greatly, depending on the number of members and the split between various membership levels. However, given the following assumptions, Table 10 provides an estimate for subscription revenues for a range of members:

- short-term passes (including 24-hour, 7-day, and 30-day) sell at a rate of 17 for every annual pass .
- ninety percent of short-term passes are day passes, with the remaining ten-percent split evenly between weekly and monthly passes.
- only 10% of annual passes are at a discounted student or senior rate¹¹.

¹¹ These statistics are extrapolated from first year metrics reporting from Minneapolis Nice Ride, San Antonio Bike Share, and Denver Bike Sharing. (Nice Ride Minnesota, 2010) (Denver Bike Sharing, 2010) (San Antonio Bike Share, 2011).

Table 10: Estimated Revenues from Bike Sharing Subscriptions Based on Numbers of Subscriber Members

No. of Members	Subscription Income
1,800	\$25,850
3,600	\$51,700
9,000	\$129,250
18,000	\$258,500
45,000	\$646,250
90,000	\$1,292,500
180,000	\$2,585,000
360,000	\$5,170,000

Additional income will be derived from trip “overages”, or trip fees for single bike rides longer than one hour. A reasonable assumption, based on other cities’ data, is that very few annual members will run overages. However, approximately 8% of short-term members will run overages, which translate to trip fees and provide additional revenue for the bike share program (C., 2011). For simplicity, this study estimates that 8% of all trips will accrue overages of not more than one hour, generating the recommended \$2 trip fee for rides between 60 minutes and 2 hours. Some rides will inevitably go over by more than one hour, and therefore incur an escalated charge of \$4, but these will be minimal, and estimates would fall within the margin of error. Looking at Appendix A which shows carbon offsets given a range of numbers of annual rides, we can estimate that for the demonstration system with only eighteen bikes, if 8% of rides go over one hour, income for trip overages will be approximately \$3,000 per year. For a very large system with 1,000 bikes and more than one million rides annually, trip overages might be around \$175,000.

All cities experience a heavy share of “casual” users (day pass subscribers) as compared to annual subscriptions. This relationship appears to balance out the longer a system operates (though short-term members still outweigh annual subscribers). Washington DC’s Capital Bikeshare is a notable example, because at a ratio of 3.7 to 1, they have a very high number of annual members (18,000) as compared to short term members (66,500) (C., 2011). By comparison, most other cities report annual memberships relative to short-term memberships much more heavily weighted toward short-term. For example, both Denver and Minneapolis sold about eighteen times more short-term subscriptions than annual passes (Denver Bike Sharing, 2010) (Nice Ride Minnesota, 2010). This suggests that Washington DC’s program could serve as a model for Houston in terms of attracting committed bike share users (i.e. annual members) early on.

Washington DC’s annual versus short-term membership sales are especially impressive given that the program is still in its first year of operations. By comparison, most bike share programs have seen short-term membership rates high early on, with annual memberships slower to gain a large share of sales. This suggests that while a small portion of bike sharing “early adopters” are eager to commit – those willing to invest in an annual pass – the majority are slightly more risk averse, preferring to “try out” the system first with a day pass. This is why, at least in the first year or two of operations, a high day pass

rate is recommended for Houston's program. As the bike share program evolves, annual memberships are preferable to short-term passes. Annual members are more likely to become repeat bike share users and to use bike share functionally, which are the kinds of behaviors that drive the real environmental and health benefits of bike sharing.

Station Sites

GIS modeling was used to identify potentially suitable locations for future bike share kiosks. ModelBuilder within ESRI's ArcMap 10 was the primary tool used in this effort. Input data was acquired from the City of Houston, the Houston Galveston Area Council, the Texas State Demographer's Office, and the U.S. Census Bureau.

The first step in identifying future bike share locations was to identify potential suitability inputs. Research into other suitability studies and internal meetings led to the creation of the following four components of site suitability:

- 1) "Walkability" – Potential for pedestrian traffic /volume
- 2) "Prime Users" – Density of employees and/or residents
- 3) "Transportation Hubs" – Proximity/access to public transportation
- 4) "Biking Infrastructure" – Proximity/access to existing biking infrastructure

Each of these components was comprised of input GIS datasets that help differentiate between areas and aided the creation of a final suitability grid. The datasets that make up each component are shown in Figure 2. A substantial amount of GIS processing and database work went into getting each of the datasets into a usable format. Each dataset was eventually converted to a grid with the same projection and resolution, and all grids were re-scaled from zero to one. Grids were then clipped by selected Super Neighborhood boundaries, which are shown as a purple outline in Figure 4.

These processed grids were given a weighting which determined their importance relative to the other grids used to create each component. The final weights are shown in Figure 2. ESRI ModelBuilder was used to construct a repeatable series of processing steps to combine each grid based on these weights. Each run of the model took about 10 minutes, and weights were changed between model runs until ideal weights for each dataset were determined. A suitability grid was the output of the model.

The grid was overlaid with potential sites, such as parks, museums, universities, major intersections and other important sites, to assign a suitability score to each site. The final suitability grid is displayed in Figure 3 and potential sites categorized by type are displayed in Figure 4. An enlarged image is provided in Appendix E. Suitability rankings and the list of sites are provided in Appendix F.

Based on the results of the modeling, the **Satisfactory** level roughly follows the Main Street Light Rail, covering areas between the downtown central business district south to the Texas Medical Center area. The **Excellent** level would expand in all directions from downtown to capture the Greater Third Ward, Northside Village, Montrose, University Place, and several other Super Neighborhoods¹² (Planning and Development: Super Neighborhoods). The **Optimal** level further expands to include most of Houston inside loop 610, plus Greater Uptown and Gulfton immediately outside the West Loop.

¹² A super neighborhood is a geographically designated area where residents, civic organizations, institutions and businesses work together to identify, plan, and set priorities to address the needs and concerns of their community. Houston is divided into 88 Super Neighborhoods.

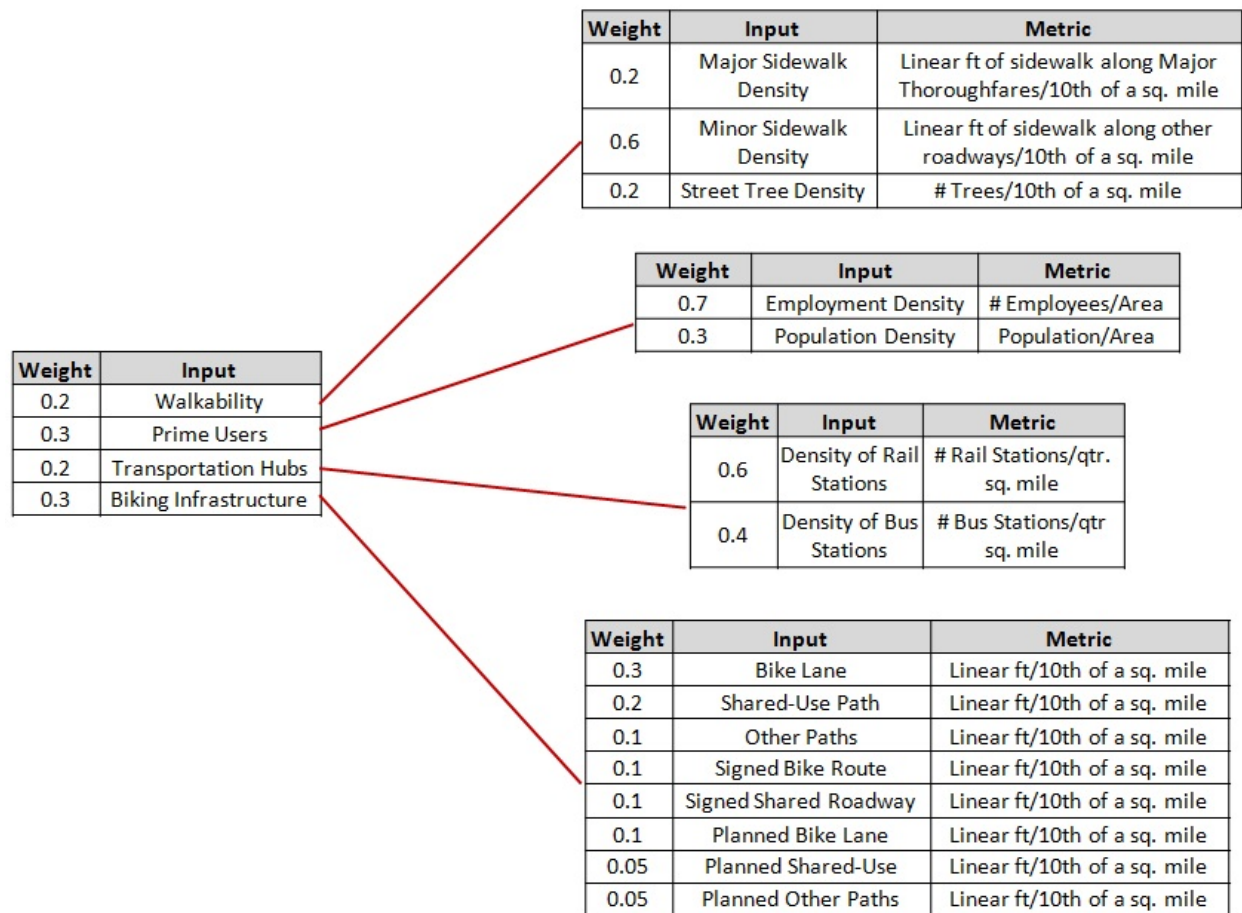


Figure 2: Bike Share Suitability Model Station Selection Criteria Weights

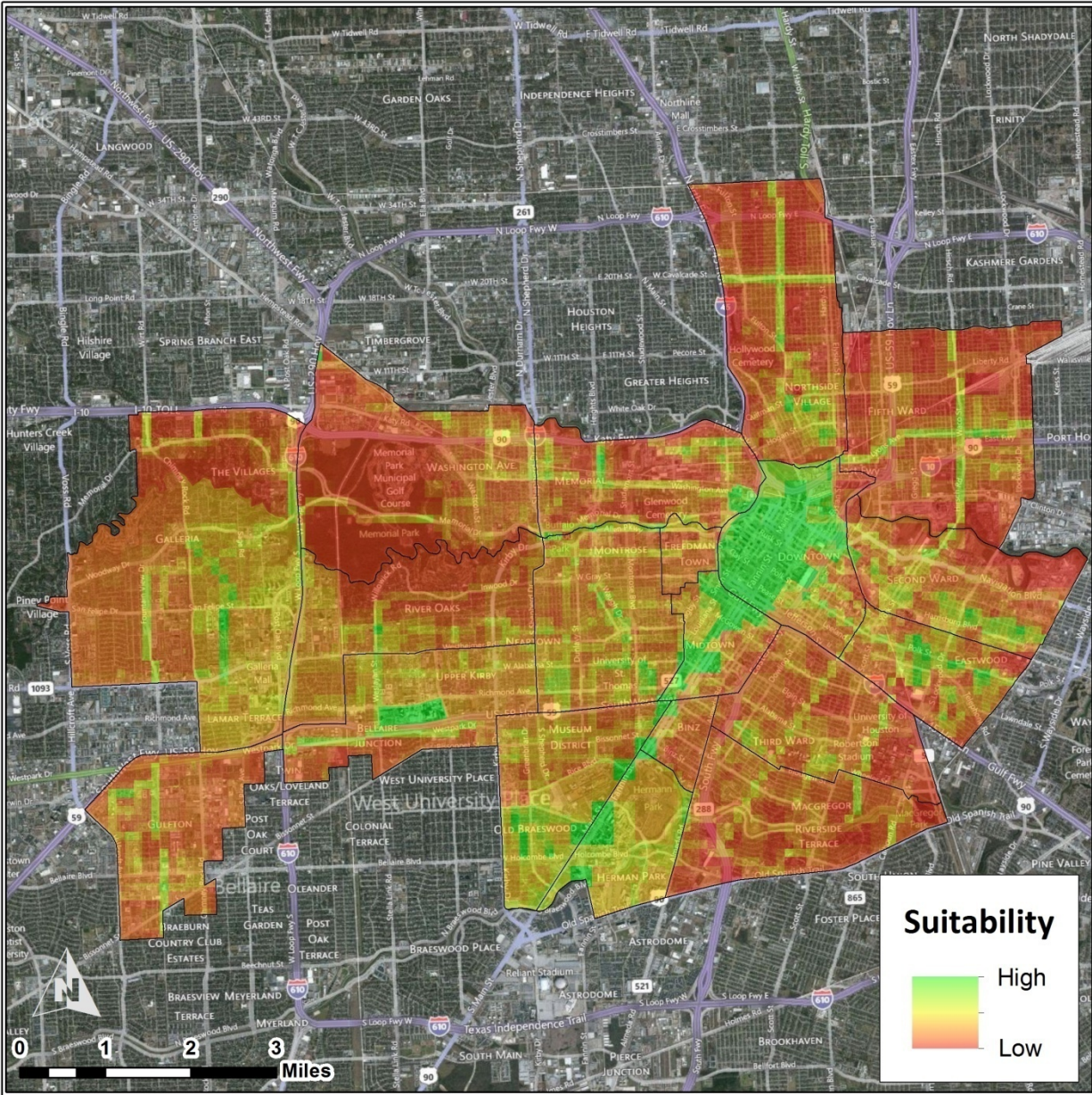


Figure 3: Bike Share Suitability Index with Gradient Reflecting High to Low Suitability for Potential Station Sites

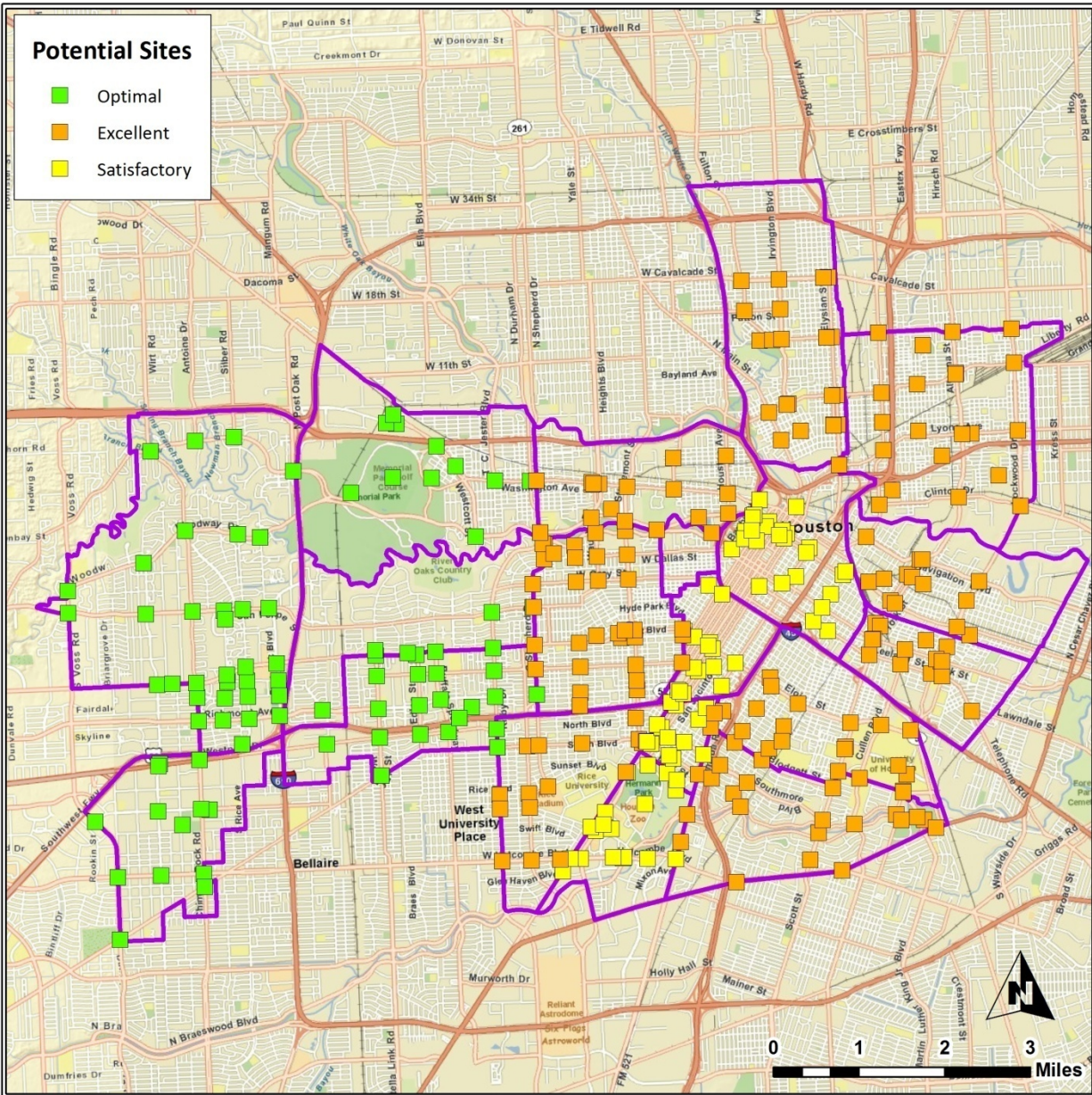


Figure 4: Houston bike share program recommended station sites for the three expansion levels (Satisfactory, Excellent, and Optimal) with Super Neighborhood boundaries identified.

Media & Public Relations Plan

Among the many lessons learned during the planning phase for the bike share demonstration program was the value of a well-orchestrated media and public relations strategy. Although there were limited resources available to implement a full-scale media plan, several small investments generated impressive returns. These basic strategies, which included a simple logo, a website (<http://bikeshare.harc.edu/Default.aspx>), a Facebook page (see www.facebook.com/houston.bikeshare), and representation at a few public events, were useful in generating public interest and in creating a “buzz” surrounding bike share.

Specifically, the website succeeded in providing potential early adopters basic information about how bike sharing works and the ideas being considered for Houston. The website led people to the Facebook page, where involved and fruitful conversations developed around various bike share topics. Several public events, including two bike share technology demonstrations, attracted another segment of the public. Although these events were advertised on the website and the Facebook page, many who attended were newcomers to Houston’s bike share initiative. At the events, people were informed of the website and the Facebook page, where they could go to learn more about the project and contribute to the discussion. In addition, the events were covered by the media, which further broadened awareness. Surprisingly simple in terms of implementation, this basic public relations strategy enabled Houston’s bike share conversation to grow, becoming progressively more inclusive and informed. This maximized even the minimal investments in outreach, because it generated valuable public input related to bike share planning.

These initial conversations with the public, facilitated by the internet and social media, proved to be tremendously efficient in terms of testing public interest and opinions, as well as improving understanding about bike sharing. These tools, especially the website and the Facebook page, are the building blocks for the more robust media and public relations plan laid out in the following sections.

Six Point Public Relations Plan

The following six activities have been identified as essential to an effective public relations strategy. In order to create a strong market for the bike share program, these activities should be implemented early on.

- Develop logo, mission statement, and boilerplate
- Improve web presence
- Expand social media strategies
- Coordinate outreach with partners and supporters
- Issue press release
- Host kick-off event

Develop logo, mission statement, and boilerplate

The following logo was created during the planning phase for the demonstration program. This logo is not intended to be permanent, but it could be used for preliminary branding and to create an initial identity for the bike share program. Alternatively, it could simply be used to help generate ideas for a different logo.

It is also worth mentioning that the B-Cycle package includes pre-set branding, so the B-Cycle logo, slightly modified for the Houston market, is likely to be the enduring logo for Houston's bike share program from the beginning and on throughout each expansion phase.

A proposed mission statement and boilerplate statement, which provides basic information about the bike share program, has also been drafted. Again, these are suggestions that can easily be modified to meet the specific needs of the bike share program that is ultimately put in place. Note that throughout this section the bike share operating organization is referred to as "Houston Bike Share." This name serves as a placeholder until a final name is selected.

Example Logos



**Houston
BikeShare**

Example Mission Statement

The mission of [Houston Bike Share] is to enhance our urban quality of life by providing all Houstonians and our guests a healthy, green, fun, and affordable way to get around town.

Example Boilerplate Statement

The City of Houston has partnered with Bike Barn and Bike Houston to form [Houston Bike Share], the 501(c)3 non-profit organization charged with administering Houston's first municipal bike sharing program. We are eternally grateful to our sponsors, _____. These individuals and businesses have shared in the vision of this exciting project and have enabled its inception with their generous investments. Funding is also made possible by grants from _____. Houston will join the small, but growing faction of U.S. cities to have implemented bike sharing systems. Through bike share programs, these cities are increasing the transportation options available to their citizens and guests by offering a healthy, green, fun, and affordable way to get around town. To learn how you can support [Houston Bike Share] and our city's new bike sharing program, please contact _____, Director, at _____.

Improve web presence

The following web address links to the website that was created during the planning stage of the bike share demonstration program. This website should be enhanced and expanded at the outset of the implementation of the bike share program, well in advance of the first phase of expansion.

<http://bikeshare.harc.edu/>

This site is currently hosted on a server maintained by the Houston Advanced Research Center, but it could easily be relocated to a different server by establishing a new web host. If re-hosted by another organization, any available domain name could be used. (e.g. bikesharehouston.org, mybikesharehouston.org, etc.)

It is important to note that, as with the logo, a website is included as part of the B-Cycle product. Examples of the site can be seen online by searching for other cities that have implemented B-Cycle bike share systems, such as Denver, Chicago, or San Antonio. The B-Cycle website is highly advanced, with top tier design elements, and an interactive user interface, including geo-coded station maps, a blog with comment posting, and other useful features. This site will predominate as the major web presence of the bike share program, since it is where members will register, upload and view their ride statistics, locate available stations, and carry out other bike share related tasks. Consequently, the website referred to above will only serve as a secondary website, or more likely, as a temporary site in advance of the permanent B-Cycle site. In any case, a robust and engaging web presence at the earliest stages of the program implementation and that is continuously adapted throughout each expansion phase is critical.

Expand Social Media Strategies: Facebook and Twitter

Below is a link to the current Houston Bike Share Facebook page, which was initiated during the demonstration program planning phase. As mentioned in the introduction, this tool was quite useful in increasing public awareness and gauging public opinion surrounding bike share, in general, as well as the specifics of bike share plans for Houston.

<http://www.facebook.com/houston.bikeshare>

Although it was not used during the demonstration program planning, a robust social media strategy should include a Twitter account with bike share updates regularly tweeted to the public.

Coordinate Outreach with Supporters and Partners: Fact Sheet and Links to Websites

Appendix C is an example of a Fact Sheet, or FAQ, that should be provided to all bike share partners and to current and planned bike share station hosts. This information can be displayed on partners' websites and could also be reformatted to be presented in other outreach. For instance, if a sponsor sends its board of directors, clients, or subscribers a monthly e-newsletter, this fact sheet could be attached. Appendix C is provided as an example, but can be modified and expanded to meet the specific needs of the bike share program that is ultimately put in place.

In addition to providing partners with an FAQ, the bike share website should display each partner's logo as a live weblink to their website.

See the following examples of how other bike share programs have displayed their sponsors' logos:

Minneapolis Nice Ride	https://www.niceridemn.org/sponsors/
Denver Bike Sharing	http://denver.bcycle.com/About/OurSponsors.aspx
San Antonio Bike Share	http://sanantonio.bcycle.com/About/SponsorsandPartners.aspx

Issue Press Release

Appendix D provides a template for a press release that could be modified to reflect the specifics of the bike share program. This press release could be issued through the City of Houston's comprehensive media network. The main objectives of the press release are to announce the kick-off of the bike share program, to provide basic information about bike sharing, and to invite the public to the planned kick-off event, which will also serve as a media event. The kick-off event is detailed in the following section.

Host Bike Share Kick-Off Event

If resources are available, a well-coordinated media and kick-off event is an excellent strategy to build momentum around the bike share program. Since the media will be in attendance, bike share media coverage will fan out from this single event. A kick-off event could be held at the beginning of the demonstration program, or at the beginning of the first sizeable expansion. Ideally, the event should be held at the site of one of the bike share stations. In general, the kick-off event should be inclusive (free to the public), should have in attendance public officials (e.g. the mayor, the Director of the Parks & Recreation Department, the city's biking coordinator, etc.), should clearly demonstrate how to use the bike share system, and, most importantly, should be fun!

Below is a list of ideas that could be incorporated into a bike share kick-off event.

- A leisure ride where prominent city leaders ride the bike share bikes on a pre-determined route between major bike share stations.
- Brief speeches by bike share program directors or others
- Brief speeches by local biking advocates, such as the president of the Bike Houston board.
- Onsite opportunities to try out the bike share bikes (free of charge)
- Onsite opportunities to purchase bike share memberships
- Bike safety talks, short courses, or information on more comprehensive training
- Family friendly activities that include children, such as bounce houses or face-painting
- Live music or a DJ
- Food and beverages

Policy, Support & Public Education

In planning for Houston's upcoming bike share program, a common question surfaced. Bike share defenders and opponents alike questioned which needed to come first: more bicyclists or better bicycle infrastructure? In a city where biking is not yet heavily prioritized as a legitimate transportation mode, are planners wise to wait for the biking community to build momentum, creating a gradual push for more investments in the policies and infrastructure that would make biking viable? Or, conversely, can the policies and infrastructure be put in place first? Would such a precedent drive momentum in the biking community, increasing the share of bike commuters, whose growing numbers would then drive even more change? Could a positive feedback loop be set in motion culminating in a great biking city, the likes of Portland or Minneapolis?

Biking Infrastructure: If We Build It, Will They Come?

The research conducted in this study points strongly to the latter. "If you build it they will come" is a mantra of transportation planners and biking coordinators from the country's prominent biking communities from Portland to Manhattan. In an article written for the online news magazine, AlterNet, local Minneapolis writer and bike advocate comments on his city's recent ranking as American's #1 Biking City by *Bicycling* magazine. "Local bicyclists would have howled at the idea of Minneapolis being named America's best city 30 years ago. It was a frustrating and dangerous place to bike...Drivers were openly hostile to bike riders...Bike lanes were practically non-existent at that time." The Bikes Belong writer goes on to point out that change in Minneapolis was gradual. The local biking community patiently lobbied for better conditions, eventually gathering the political will to invest in biking. And changes have followed quickly. Today, Minneapolis boasts the nation's first and arguably the most successful bike share program, Nice Ride, as well as one of the most impressive networks of off-street bicycle trails. Since 2007, the number of bike commuters has increased by 33% (Walljasper, A Surprising Town Is Now America's Top Bike City).

In an interview with Roger Geller, the City of Portland's Bicycle Coordinator, he paints a similar picture of his city prior to the 1990s. Bicycle commuting as a share of overall trips was the same as other cities across the U.S. Bicycling was not heavily prioritized, and lacking safe and convenient infrastructure on-street, the average bicyclist felt uncomfortable pedaling beyond recreational trails. Political leadership in the 1990s spurred investments in infrastructure and some of the nation's most innovative urban biking strategies, such as traffic signals for bikes, colorized bike lanes, and bike boxes (a designated area in busy intersections where bicyclists can gather in plain view of cars at the stoplight) (Walljasper, Bicycling Design Best Practices Program). It is these types of investments that have made Portlanders feel safer riding a bicycle not just for fitness or recreation, but to get to the places they need to be. Biking is today a part of life in Portland. Current estimates show that 14 to 20% of all trips made in Portland are by bicycle¹ (Pearsall, 2011).

Transportation studies indicate that the "build it and they will come" behavior is reflected in the "induced travel" phenomenon, whereby increases in driving typically follow highway expansions.

(Cassady, Dutzik, & Figdor, 2004). This report posits that the same induced travel behavior will be modeled by bicyclists in Houston provided improvements are made to biking infrastructure and the policies are in place to support their safe mobility. Indeed this outcome may be just on the horizon for Houston. If promoting bicycling as a viable transportation alternative is the anticipated outcome, Houston is taking many steps in the right direction.

Moving in the Right Direction: Broad Support for Bicycling in Houston

Over the past five years, Houston has made great strides toward becoming a more bike “friendly” city. The Houston-Galveston Area Council (HGAC) updated its 2035 Regional Bikeway Plan in 2007. This comprehensive report serves as a guide for investment, interagency coordination and best practices in developing facilities for bicyclists in the 8-county Houston-Galveston Transportation Management Area (TMA) and details planned and completed bicycling facilities and other projects that facilitate cycling in the region. The report lists several impressive undertakings by the City of Houston in carrying out their Comprehensive Bikeway Plan, including the completion of 280 miles of on-street bikeways and 20 miles of off-street bikeways, with a remaining 45 miles of planned and funded shared-use paths. The report states that the city has received \$54 million in federal funding for 33 cycling-related infrastructure projects¹³. Among other projects, the city has added parking facilities for 1,600 bicycles, continued its popular Bike-to-Work Day event, and produced and distributed 50,000 free bikeway maps (HGAC, 2007).

Acknowledging the important role that policy plays in encouraging biking as a viable form of transportation, the City recently made recommendations for Houston’s first-ever bike parking ordinance. The new ordinance would require that one bicycle parking space be provided for every 25,000 square feet of gross floor area (GFA) in commercial properties in the urban area (Off-Street Parking Ordinance: Houston Planning Commission Subcommittee Recommendations, 2011). The recommendations are currently under review by the Planning Commission.

With its continuous expansion of the city’s interconnected bikeway network¹⁴, the City of Houston’s Bikeways Program has made significant contributions to the state of biking in Houston. Under the direction of Dan Raine, this group, which is housed in the city’s Public Works and Engineering Department, is a leader in providing Houstonians opportunities to learn how to ride safely on our city’s streets.

METRO’s Visible Partnerships Lead to Valuable Contributions

Other steps to enable biking as a viable transportation option have been made. In 2007, METRO partnered with BikeHouston and other local bike advocacy groups to launch a highly successful bikes-

¹³ As of 2007, which is the last available update to the Regional Bikeway Plan.

¹⁴ The City of Houston offers over 300 miles interconnected bikeway network spanning across 500 square miles. The network includes bike lanes, bike routes, signed-shared lanes and shared-use paths, commonly referred to as ‘hike and bike’ trails, which includes rails to trails, and other urban multi-use paths. In addition to these bicyclist transportation facilities, there are over 80 miles of hike and bike and nature trails found in City of Houston parks. In addition, Harris County and many municipal utility districts have constructed over 160 miles of bikeways within the City limits. From (Welcome – Houston Bikeway Program, 2011)

on-board program, which it has since expanded multiple times to include allowing bicycles on light rail vehicles and to expand bike boarding hours for bus and rail transit (METRO, 2010). Today nearly all METRO buses are equipped with bike racks or storage compartments, and total bikes boarded on bus and rail since the launch is nearly 245,000 (METRO, 2011). Meanwhile, METRO is finding other ways to collaborate with the biking community to improve bikers' access to transit. In addition to the bikes-on-board program, METRO is partnering with BikeHouston to increase bike connectivity to transit centers via improved bike paths and to place more bike racks along light rail boarding platforms. Says Acting president and CEO George Greanias, "Our partnership with BikeHouston represents the kind of collaboration the community will see from the new METRO. Biking and METRO are important alternatives to driving and are natural complements, reducing both traffic and helping clean our air" (METRO, 2010). As the "new" METRO continues to evolve, it will be a fundamental player in Houston's emergence as a more livable city, where single occupancy vehicles are just one of many transportation alternatives.

Houston Parks Board and the Bayou Greenways Initiative

Among many other promising advances toward a more supportive biking environment in Houston is the Houston Parks Board's Bayou Greenways Project. This bold initiative aims to foster Houston's emergence as one of the nation's leading "quality of place" cities by connecting greenways and park spaces along ten of the area's major bayous. Among other goals, many of them focused on creating more equitable access to parks and open spaces, the initiative plans to add 300 miles of continuous all-weather hike and bike trails that will traverse the greenways. The Parks Board notes that such an achievement would be unparalleled in the nation (Houston Parks Board, 2088).

Major Regional Planning Efforts Focus on Livability with Strong Implications for Biking

Perhaps most promising for Houston's future as a bicycle "friendly" city are two major planning efforts that are underway in the region. Funded by federal transportation dollars, the Houston-Galveston Area Council (HGAC) supports Livable Centers planning studies throughout the region. According to the program's goals, livable centers are walkable, mixed-use places that provide multimodal transportation options, improve environmental quality, and promote economic development (HGAC, 2011). A fundamental metric for these studies is transportation mode shift, resulting from the enlistment of planning strategies intended to create more pedestrian-friendly, livable communities. Opportunities to facilitate bicycling and other modes as alternatives to single occupancy vehicles is a primary focus. From the Energy Corridor, to Midtown, to the Northside, and beyond the metropolitan area to the small cities of Tomball and Waller, nearly a dozen studies have so far been completed. A review of final recommendations for these livable centers study areas shows that nearly all have listed improved biking infrastructure among their primary strategies going forward (HGAC, 2011).

In an unprecedented region-wide partnership of governments, businesses, educational institutions, and non-profits, the Houston-Galveston Area Council sought and was awarded (on behalf of the 13 county region) a \$3.75 million Sustainable Communities Regional Planning Grant to develop a plan for sustainable development for the Texas Gulf Coast region. Funded by the U.S. Department of Housing and Urban Development through the Administration's Partnership for Sustainable Communities, this

plan will identify opportunities to meet the needs of the region’s diverse communities in a manner that does not compromise the needs of future generations, with respect to natural and economic resources (Sustainable Communities Regional Planning Grant, 2011). With the shared theme of social equity underlying each of the study areas, subject matter experts from the region’s urban, suburban, rural and coastal communities have been convened in five technical advisory groups: housing, the environment, healthy communities, economic development, and transportation and infrastructure. The bicycling community is well-represented in this last group. Their message is loud, clear, and carefully crafted that an increasingly large share of the public is demanding safer, more convenient access to bicycling as a viable transportation option.

Removing the Barriers to Becoming Bicycle Friendly

Like many cities, Portland’s emergence as a world-class bicycling city came largely as a result of strong political leadership that pushed for investments in bicycle infrastructure. As Roger Geller notes in his report entitled *Build It and They Will Come*, “It is only when Portland began investing in bicycle infrastructure that residents began to use bicycles for transportation at rates higher than the national average” (Geller, 2011).

Geller maintains that the one thing that Portland and other great biking cities share in common is that they have removed the element of fear associated with bicycling in an urban environment. Studies repeatedly point to fear as the number one reason that people choose not to rely on their bicycles to get them from point A to point B. When pressed further, these people generally report that it is not other cyclists or bicycling itself that makes them fearful, but rather people driving automobiles (Geller, *Four Types of Cyclists*). This points to a starting place for Houston as it attempts to prepare itself for a vibrant bike sharing program. The HGAC reports in its 2007 update to the Regional Bikeway Plan that the Houston-Galveston region has one of the state’s highest rates of crashes involving motorists and bicyclists (HGAC, 2007). Mitigating the risk for bicyclists on the street and alongside automobiles is the key to increasing the mode split for bicycling in the urban environment.

Mitigating bicyclists’ risk can be done in several ways. A good starting point is the League of American Bicyclists’s six E’S for creating bicycle friendly communities. The Houston-Galveston Area Council provides this tool in their 2009 report *Building Better Bikeways: A Planning Guide for the Houston-Galveston Region* (HGAC, 2009). HGAC Table 11 below lists the six E’s and suggested activities or programs that target each.

The Six E’s for Bicycle Friendly Communities	Example Programs and Activities
Engineering	Identify convenient bike routes and add/improve bikeways, especially colored or striped, exclusive use signed bike lanes (as opposed to signed shoulders or signed shared roadways).
Education	Partner with the Department of Motor Vehicles to incorporate more questions pertaining to bike safety on drivers’ exams.

Encouragement	Conduct public marketing of the benefits of biking and how to do safely via social networking sites and/or other media
Enforcement	Enforce bike safety laws equitably between drivers and cyclists
Equality	Identify communities that have low automobile access for prioritized bikeway improvements, especially those improvements that increase access to major street networks and public transit routes.
Evaluation & Planning	Conduct before and after bicycle/pedestrian counts

The City of Portland has found that the three most effective ways to eliminate fear and improve the convenience-factor for would-be bicycle commuters is to implement a bicycle plan that incorporates:

1. Shorter trips distances between the places people want and need to go.
2. Better bicycle facilities on the street, including innovative strategies such as bike boxes and traffic calming techniques.
3. Better end-of-trip facilities, such as bike racks, bike corrals (large mass bicycle parking areas), showers and lockers (Geller, Four Types of Cyclists).

Bike sharing is coming to Houston. The city is prepared to launch a reasonably successful bike sharing program. Over the past fifteen years, Houston has made great strides in becoming more accessible to cyclists and pedestrians. However, there are significant efforts that can and should be made in order to maximize the benefits of a large-scale, functionally used bike sharing program like the one envisioned for our city.

Making Bike Sharing Work for Houston: Recommendations for Improved Policy, Infrastructure and Education

1. Increase Dedicated Funding Sources for Bicycle Projects and Programs

In order to become a top-notch bicycling city, ensuring the success of its upcoming bike share program, the City of Houston must commit to a prolonged increase in its allocation of resources to bicycling projects and programs. However, this does not necessarily mean increasing dollars spent on transportation projects. When it comes to facilitating mobility, the key for Houston is to begin investigating ways that more can be done with the same amount. Bicycling provides the best return on investment for transportation dollar spent in terms of providing personal mobility. Studies show that mobility can actually be *increased* by spending *less*: less on expensive roadway improvements and more on inexpensive active transportation projects (bicycling and pedestrian improvements). Consider these figures from the City of Portland's transportation expenditures. In the period 1995-2010 Portland spent \$4.3 billion on roadway and freight improvements, \$3.1 billion on transit improvements and \$153 million on bicycling and pedestrian projects. Yet mobility has stayed the same or improved in most areas of the city. In roughly the same time period, bicycle and transit commuting have increased by 400% and

18%, respectively, while driving alone has declined by 4% (Geller, *Build It and They Will Come: Portland Oregon's Experience with Modest Investments in Bicycle Transportation*, 2011).

To increase funding for bicycling infrastructure without decreasing mobility (and likely improving mobility) the city could consider the creation of a “bicycle fund” where a certain percentage of transportation dollars are allocated to a fund for the exclusive use of bicycle projects included in the Transportation Improvement Program (TIP). The State of Oregon passed its “Bike Bill” in 1971 requiring the inclusion of facilities for pedestrians and bicyclists wherever a road, street or highway is built or rebuilt and requiring the state department of transportation, cities, and counties to spend a minimum of 1% of all general transportation revenues on pedestrian and bicycling facilities (Geller, *City of Portland Bicycle Coordinator*, 2011).

Increased effort should be focused on pursuing federal dollars that would be exclusively and strategically used to support bicycling projects. A few resources that have been used in other cities to further their bicycling goals are:

- The Department of Transportation's Federal Transportation Investment Generating Economic Recovery (TIGER) grants
- The Federal Highway and Federal Transit Administrations' Congestion Mitigation and Air Quality Improvement (CMAQ) Program
- The Federal Highway Administration's Non-Motorized Pilot Program funds. Columbia, Missouri; Marin County, California; Minneapolis-St. Paul, Minnesota; and Sheboygan County, Wisconsin have received these funds in the past.

2. Invest in “Neighborhood Greenways” along Existing Roadways

In order to improve the likelihood that bike sharing will work well for everyone in Houston, the city must be sincere about its efforts to reduce the alarming figures for bicycle collisions with motorists in the Houston area. Upon further investigation of these statistics, the HGAC found that the majority of these dangerous accidents were concentrated in low-income areas where people are less likely to have access to an automobile (and, therefore, are more likely to rely on bicycles for their main mode of transportation) (HGAC, 2007). As the bike sharing program expands, these are communities that should be targeted, because of the program's capacity to provide a necessity (transportation) at a relatively low cost.

Neighborhood greenways are low-cost improvements, because they make use of existing roadways, but they are extremely effective at enabling cyclists to commute safely and conveniently from their neighborhoods to common destinations, such as schools, business districts, and shopping areas. They incorporate innovative traffic calming and crossing treatments, have fewer stops for cyclists and pedestrians (vehicular cross-traffic is required to stop), and very clear signage about how the roadway operates for all users – automobiles, cyclists, and pedestrians. They also tend to be attractive and help to improve the look and feel of residential areas. Neighborhood greenways will provide an excellent

complement to the bike sharing program. A bike share station placed strategically along a greenway creates an efficient conduit for users to travel from home to more central locations.

3. In the Urban Area, Emphasize Bike Lanes Over Signed Shared Roadways or Signed Shared Shoulders

Dedicated bike lanes with clear signage and striping, well-drained and kept clear of debris, and with enforcement of rules against automobile driving and parking in the lane are the safest way for cyclists to commute alongside vehicular traffic. As mentioned, reducing the fear associated with cycling in an urban area will do much to increase bicycle commuting. The success of the bike sharing program relies on a large market of potential users who feel confident sharing the road.

4. Identify Where Existing Cycling Commutes Overlaps with Density and Concentrate Bike Sharing Efforts There

A successful bike sharing system will rely on density – a density of stations distributed amongst a density of sites that people want and need to go. Houston is unique in that there are several dense business districts. However, not all of these will be prime locations for bike sharing, because they may not coincide well with other complements to bike sharing, such as: proximity to other parts of the city, convenient access to transit, proximity to dense residential centers, and a high concentration of cycling commutes. To generate the highest return on the bike share investment, the areas of the city where these characteristics overlap the most should be identified, so that bike share program expansion can be emphasized in these areas. HGAC has conducted studies to identify where bicycle commutes to work are the highest and has found that in Houston the Texas Medical Center represents the area with the most bicycle commuters (HGAC, 2007). The next highest concentration of bicycle commuting is downtown.

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APPENDIX A: Estimated Annual Carbon Offsets from Bike Sharing

Bikes	Avg Trip Distance	Daily Trips Per Bike	Annual Trips Systemwide	Annual Miles Ridden	Annual VMT Replaced	Fuel Economy	Gas per VMT	Annual CO ₂ Offset	Annual CO ₂ Offset
	(miles)			(mi/yr)	(miles)	(mpg)	(gal/mile)	(1b/yr)	(metric tons/yr)
18	2.5	3	19,710	49,275	16,425.00	18.07	0.06	17,631.97	8
50	2.5	3	54,750	136,875	45,625.00	18.07	0.06	48,977.70	22
100	2.5	3	109,500	273,750	91,250.00	18.07	0.06	97,955.40	44
250	2.5	3	273,750	684,375	228,125.00	18.07	0.06	244,888.50	111
500	2.5	3	547,500	1,368,750	456,250.00	18.07	0.06	489,777.00	222
780	2.5	3	854,100	2,135,250	711,750.00	18.07	0.06	828,477.00	376
1000	2.5	3	1,095,000	2,737,500	912,500.00	18.07	0.06	979,554.01	444
1500	2.5	3	1,642,500	4,106,250	1,368,750.00	18.07	0.06	1,469,331.01	666
2640	2.5	3	2,890,800	7,227,000	2,409,000.00	18.07	0.06	2,804,076.00	1,272
3460	2.5	3	3,788,700	9,471,750	3,157,250.00	18.07	0.06	3,675,039.00	1,667
5000	2.5	3	5,475,000	13,687,500	4,562,500.00	18.07	0.06	4,897,770.03	2,222

DEMO SYSTEM

SATISFACTORY

EXCELLENT

OPTIMAL

APPENDIX B: Estimated Annual Revenues from Bike Sharing

24-Hour	\$10	1,530	3,060	7,650	15,300	38,250	76,500	153,000	306,000
7-Day	\$20	85	170	425	850	2,125	4,250	8,500	17,000
30-Day	\$30	85	170	425	850	2,125	4,250	8,500	17,000
Total Short-Term		1,700	3,400	8,500	17,000	42,500	85,000	170,000	340,000
Yearly	\$65	90	180	450	900	2,250	4,500	9,000	18,000
Student/Senior Yearly	\$45	10	20	50	100	250	500	1,000	2,000
Total Yearly		100	200	500	1,000	2,500	5,000	10,000	20,000
TOTAL SUBSCRIPTIONS		1,800	3,600	9,000	18,000	45,000	90,000	180,000	360,000
TOTAL SUBSCRIPTION REVENUE		\$25,850	\$51,700	\$129,250	\$258,500	\$646,250	\$1,292,500	\$2,585,000	\$5,170,000

Annual Trips*	No.Trips > 1-hr	TRIP FEES (EST.)
19,710	1,577	\$3,154
54,750	4,380	\$8,760
109,500	8,760	\$17,520
273,750	21,900	\$43,800
547,500	43,800	\$87,600
1,095,000	87,600	\$175,200
1,642,500	131,400	\$262,800
5,475,000	438,000	\$876,000

*See Appendix A

APPENDIX C: Media Plan Bike Share Fact Sheet for Distribution to Partners

What is Bike sharing?

Bike sharing is a way of providing bicycles to people for short-term use to make quick trips in and around an area.

How does it work?

Anyone with access to a credit or debit card can purchase a bike share membership. (Options are being explored to make the program available in the future to those without credit/debit cards.) Members can go to any of the city's three stations to check out a bike. Just swipe your membership card (or the credit card you used to join), release the bike from the docking station, and you're on your way. Return your bike to any station within one hour, and your ride is free.

How much does it cost?

There are two payment transactions required to bike share: (1) your membership fee, and (2) your trip fee. A bike share membership DOES NOT allow members unlimited free access to the bikes.

Here's how it works: Purchase your membership online, or at the bike share kiosk (7-day and 24-hour pass only). Check out a bike and ride it for up to one hour for free. Trip fees are assessed at escalating rates for rides longer than an hour.

Subscriptions		Trip Fees	
24 hour	\$10	0 – 60 min	FREE
7 day	\$20	60 min – 2 hrs	\$2
30 day	\$30	Each addl 1/2 hr	+\$4
1 year	\$65		

Prices discourage long trips. This is good for two reasons: (1) Bike sharing is designed to replace short vehicle trips, which are a major source of greenhouse gas emissions. If pricing doesn't discourage long trips, then the major incentive to use bike share could shift from commuting to recreation, which would not achieve the goal of replacing vehicle trips. (2) The bikes will stay in circulation and available for other users. This is why we call it bike "sharing"!

Where are the stations?

Although funding for system expansion is actively being pursued, this current "demonstration" stage

for the Houston bike share program consists of three stations:

- 1.) *The George R. Brown station*, 1001 Avenida De Las Americas
- 2.) *The Market Square Park station* at the intersection of Milam and Preston Streets.
- 3.) *Central Library station* at the intersection of Lamar and Bagby Streets.



How do the bicycles work?

The bike share bicycles are designed for short trips made by people wearing everyday clothes just going about their business. The bicycles are attractive and sturdy, and use advanced technologies, such as solar powered stations, GPS tracking, and credit-card checkout. They are equipped with kickstands, fenders, lights, and baskets for carrying small bags, laptops, and even your coffee. They are easily adjustable and designed for hassle-free use by a wide range of people carrying out a wide range of activities. Sight-seers, commuters, business people – nearly everyone can bike share!

What if someone steals or damages a bike?

Modern bike sharing presents fundamental barriers to theft because a person's credit card is linked to their bike rental. If a bike is stolen or damaged while it is checked out, the person whose credit card is associated with the bike will be charged. A stolen bike will result in a \$1000

fine. Furthermore, the bikes and docking stations come equipped with a number of anti-theft devices, such as robust Kryptonite bike locks (for when users need to lock the bike up somewhere other than at a docking station) and a dual locking mechanism that double secures the bicycle at the dock. Additionally, the bikes are branded and are much heavier than typical bikes, so a theft is limited in how they can transport the bike. In bike share cities across the U.S. theft has been rare.

What are “B-stations”, “docking stations”, “kiosks”, and “B-cards”?

A B-Station, or docking station, is a special facility where bicycles are secured. There are currently three B-stations in Houston’s demonstration bike share program. Each B-station comprises a kiosk (for electronic access) and several bicycles. A company, called “B-Cycle” supplied our bike share technology, which includes the bicycles, kiosks, docking stations, and web interface. This is where we get the terms “B-Station” and “B-Card”.

Who operates bike share?

Bike share is operated by a non-profit organization, called [Houston Bike Share](#). The system is also supported by volunteers. [Houston Bike Share](#) and its volunteers work behind the scenes to manage bike share customer service and finances, schedule bike maintenance, rebalance the bikes between stations, promote the bike share program, and raise funds for future system expansion.

How is Bike sharing funded?

As in other cities with bike share systems, bike sharing in Houston is funded in three ways:

- 1.) *Grants*
- 2.) *Sponsorships and donations*
- 3.) *Membership subscriptions and trip fees*

What are the Benefits of Bike sharing?

- Bike sharing maximizes our public investment in mass transit by providing a good complement to bus and rail systems. Bike sharing stations can be deployed at or near transit stations.
- Bike sharing contributes to environmental stewardship by eliminating pollution caused by multiple short vehicle trips
- Bike sharing supports a healthy public by giving riders a healthier transportation choice.
- Bike share systems provide a visible, affirmative message that Houston is a livable city that supports bicycling.
- Bike sharing contributes to an active, vibrant urban core. It can spur economic development by increasing access to retail outlets and other businesses and by providing tourist incentives.
- Bike sharing encourages all forms of alternative transportation - walking, transit riding, and cycling alike.
- Most of the year, Houston provides a great climate for bicycling, and even in hot weather, short trips can be made comfortably by many people.

Weblinks

[Houston Bike Share](#) (temporary site):
bikeshare.harc.edu

[Houston Bike Share](#) on Facebook:
www.facebook.com/houston.bikeshare

For more information on bike sharing in Houston, contact: _____, Director of [Houston Bike Share](#) at _____.



NEWS RELEASE

FOR IMMEDIATE DISTRIBUTION

Contact: xname xnumber xemail

Release Date: Mon., XX, 20XX

<http://bikeshare.harc.edu/>

New Spin on Urban Travel Launches Bike Sharing Program

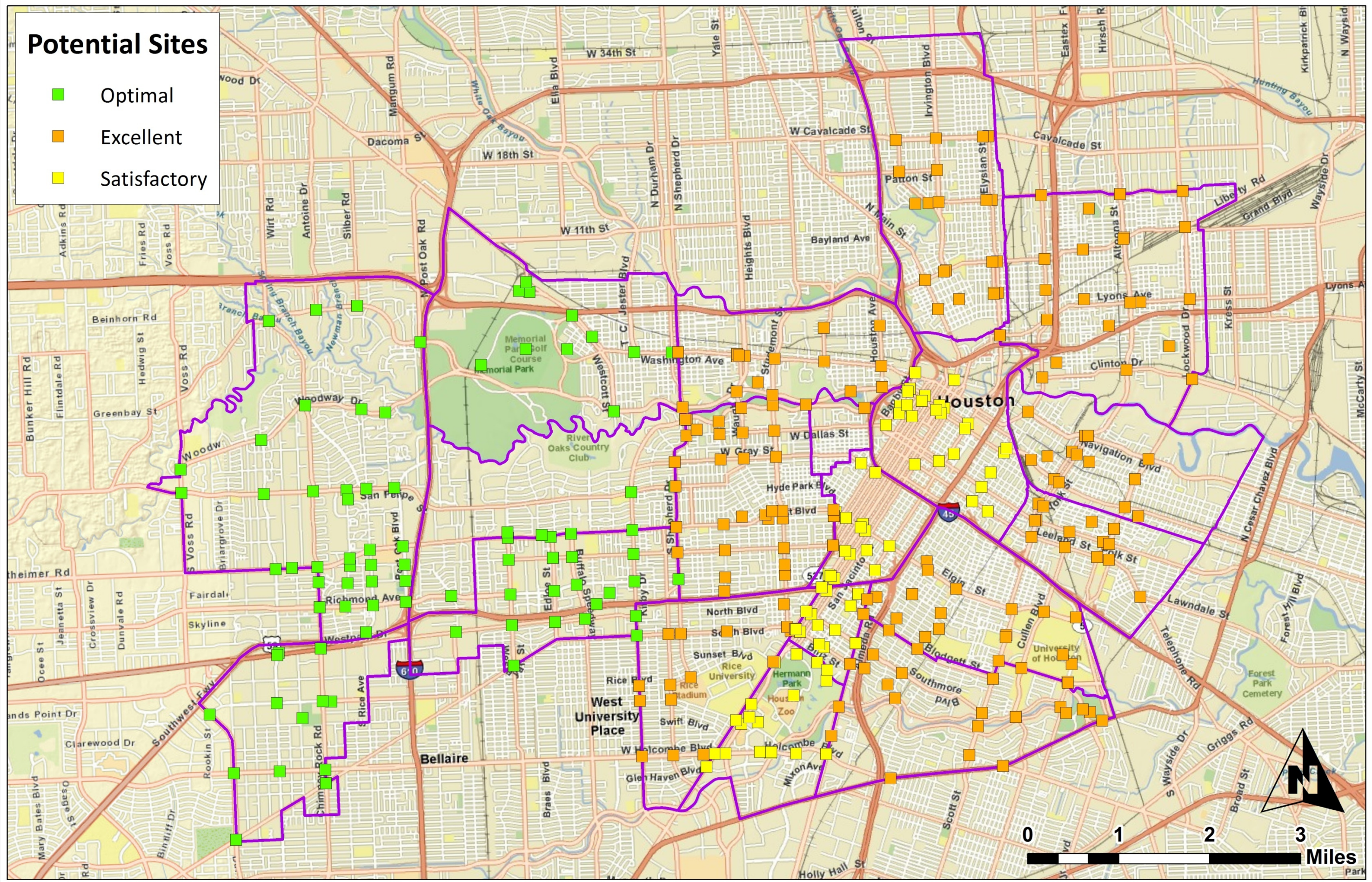
Houston Bike Share Pedaling Green, Healthy Trips Around Town

Visitors to Houston, and residents who are looking for a more freewheeling approach to travel, will be pleased to see bicycles available at kiosks in several down and near town locations. The **program is being introduced to the public with a kick-off event and leisure ride beginning at XXXLocation on XXDay, XXDate, XXMonth, 20XX.** Mayor Annise Parker encourages participation saying, "Houstonians can access more of Houston's green spaces, and food and entertainment venues by cycling. The mission of *Houston Bike Share* is to enhance our urban quality of life by providing all Houstonians and our guests a healthy, green, fun, and affordable way to get around town."

Community leaders and organizations like Bike Houston will be on hand for this event which is free and open to the public. Bike ride participants will see the system demonstrated and safety explained. It's practical, and most importantly, it should be fun! The ride ([map link here](#)) travels between Bike Share stations where there will be opportunities to try out the bikes (free of charge) and purchase Bike Share memberships. Sponsor BikeBarn will offer bike safety talks, and instruction on equipment. Family friendly activities including a bounce house and a DJ make this a festive occasion.

Bike share bicycles will be available at XXlocations, XX, XX. Annual memberships are purchased online for \$65, with shorter term options available. To encourage quick trips and keep bikes circulating, rides are free for the first hour, but assess fees for additional hours. Bikes are accessed via an automated credit/debit card kiosk that controls access to the bike. (fact sheet attached) Other cities that have bike share systems are Denver, Chicago, and San Antonio.

*The City of Houston has partnered with Bike Barn and Bike Houston to form *Houston Bike Share*, the 501(c)3 non-profit organization charged with administering Houston's first municipal bike sharing program. Funding is also made possible by grants from _____. Houston joins a small, but growing faction of U.S. cities with bike sharing systems. Bike share programs increase the transportation options for all by offering a healthy, green, fun, and affordable way to get around town. Learn how you can support *Houston Bike Share* by contacting _____, Director, at _____.*



APPENDIX F: Listing of Recommended Station Locations for Bike Share Program Expansion

Site	Suitability Rank	Suitability Score	Name	Type	Neighborhood Name	Neighborhood Category	X Coordinate	Y Coordinate
1	1	0.28345	SOUTH TEXAS COLLEGE OF LAW	University	DOWNTOWN	Satisfactory	3121163.297	13838657.077
2	2	0.21917	Discovery Green	Parks	DOWNTOWN	Satisfactory	3123431.388	13839273.497
3	3	0.21520	UNIVERSITY OF HOUSTON-DOWNTOWN	University	DOWNTOWN	Satisfactory	3123465.978	13843565.944
4	4	0.20613	PRAIRIE & MAIN	Intersection	DOWNTOWN	Satisfactory	3122588.647	13842104.905
5	5	0.20557	TEXAS & FANNIN	Intersection	DOWNTOWN	Satisfactory	3122690.310	13841631.309
6	6	0.20544	GRAY & LOUISIANA	Intersection	MIDTOWN	Satisfactory	3118869.562	13838195.344
7	7	0.20512	TEXAS & MAIN	Intersection	DOWNTOWN	Satisfactory	3122407.903	13841817.840
8	8	0.20361	TEXAS & LOUISIANA	Intersection	DOWNTOWN	Satisfactory	3121567.720	13842356.109
9	11	0.18431	BINZ & MAIN	Intersection	BINZ	Satisfactory	3114263.066	13829097.203
10	12	0.18387	Jones Jessie H Library Bldg	LIBRARY	MEDICAL CENTER AREA	Satisfactory	3111556.543	13823988.389
11	13	0.18351	UT Med School Bike Rack	Bike Rack	MEDICAL CENTER AREA	Satisfactory	3111661.664	13824744.016
12	14	0.16234	BLODGETT & MAIN	Intersection	MIDTOWN	Satisfactory	3115745.485	13831525.099
13	15	0.15679	PRAIRIE & LOUISIANA	Intersection	DOWNTOWN	Satisfactory	3121755.526	13842647.938
14	16	0.15510	Tranquility Park Bike Rack 1	Bike Rack	DOWNTOWN	Satisfactory	3120297.815	13842063.007
15	17	0.15486	PRAIRIE & BAGBY	Intersection	DOWNTOWN	Satisfactory	3120948.015	13843087.014
16	18	0.15486	MEMORIAL & BAGBY	Intersection	DOWNTOWN	Satisfactory	3120870.551	13843061.735
17	19	0.15449	BINZ & FANNIN	Intersection	BINZ	Satisfactory	3114496.443	13828946.718
18	20	0.14960	Us Courts Library	LIBRARY	DOWNTOWN	Satisfactory	3120720.897	13842116.626
19	21	0.14647	Toyota Center Bike Rack	Bike Rack	DOWNTOWN	Satisfactory	3122567.960	13838849.371
20	23	0.14296	SUNSET & FANNIN	Intersection	MEDICAL CENTER AREA	Satisfactory	3113041.603	13827177.114
21	24	0.14296	SUNSET & MAIN	Intersection	MEDICAL CENTER AREA	Satisfactory	3113041.603	13827177.114
22	25	0.14280	PRAIRIE & FANNIN	Intersection	DOWNTOWN	Satisfactory	3122874.933	13841923.190
23	26	0.13767	Central Library	LIBRARY	DOWNTOWN	Satisfactory	3120257.164	13841614.716
24	27	0.13767	Film Library	LIBRARY	DOWNTOWN	Satisfactory	3120257.164	13841614.716
25	28	0.13767	Houston Public Library	LIBRARY	DOWNTOWN	Satisfactory	3120257.164	13841614.716
26	29	0.13631	Tax Library	LIBRARY	DOWNTOWN	Satisfactory	3120995.264	13841459.377
27	30	0.13553	UNIVERSITY & MAIN	Intersection	MEDICAL CENTER AREA	Satisfactory	3110783.810	13823807.958
28	31	0.12718	WASHINGTON & BAGBY	Intersection	DOWNTOWN	Satisfactory	3121195.384	13843996.857
29	32	0.12679	UNIVERSITY & FANNIN	Intersection	MEDICAL CENTER AREA	Satisfactory	3111079.371	13823608.816

APPENDIX F: Listing of Recommended Station Locations for Bike Share Program Expansion

30	33	0.12054	BAYLOR CENTER OF MEDICINE	University	MEDICAL CENTER AREA	Satisfactory	3112036.549	13823705.585
31	34	0.11979	ELGIN & MAIN	Intersection	MIDTOWN	Satisfactory	3118014.457	13835014.458
32	35	0.11959	HOUSTON COMMUNITY COLLEGE	University	MIDTOWN	Satisfactory	3118136.474	13835210.641
33	36	0.11867	TEXAS & BAGBY	Intersection	DOWNTOWN	Satisfactory	3120806.921	13842850.123
34	38	0.11341	DALLAS & BAGBY	Intersection	DOWNTOWN	Satisfactory	3119480.327	13840947.943
35	40	0.09890	GRAY & BAGBY	Intersection	MIDTOWN	Satisfactory	3118043.449	13838725.460
36	41	0.09745	HCC Bike Rack	Bike Rack	MIDTOWN	Satisfactory	3118369.665	13833687.498
37	43	0.09600	PRAIRIE & CRAWFORD	Intersection	DOWNTOWN	Satisfactory	3124264.523	13841027.032
38	44	0.09537	TEXAS & CRAWFORD	Intersection	DOWNTOWN	Satisfactory	3124077.534	13840741.070
39	45	0.09040	ALABAMA & MAIN	Intersection	MIDTOWN	Satisfactory	3117123.188	13833641.572
40	46	0.08943	ALABAMA & FANNIN	Intersection	MIDTOWN	Satisfactory	3117405.055	13833453.485
41	47	0.08703	BLODGETT & FANNIN	Intersection	BINZ	Satisfactory	3116032.739	13831335.594
42	55	0.07947	POLK & DOWLING	Intersection	DOWNTOWN	Satisfactory	3125034.404	13837351.302
43	68	0.06866	HOUSTON COMMUNITY COLLEGE	University	MEDICAL CENTER AREA	Satisfactory	3109066.235	13821111.208
44	72	0.06691	HOLCOMBE & FANNIN	Intersection	MEDICAL CENTER AREA	Satisfactory	3110171.657	13821886.838
45	80	0.06244	M D Anderson Patient Library	LIBRARY	MEDICAL CENTER AREA	Satisfactory	3112164.768	13821977.109
46	92	0.05924	Hermann Park 4 Bike Rack	Bike Rack	MEDICAL CENTER AREA	Satisfactory	3115499.851	13827168.740
47	101	0.05698	HOLCOMBE & MAIN	Intersection	MEDICAL CENTER AREA	Satisfactory	3109520.350	13821871.830
48	102	0.05679	UNIVERSITY OF TEXAS MEDICAL	University	BINZ	Satisfactory	3116087.238	13826727.253
49	114	0.05427	HOLCOMBE & BRAESWOOD	Intersection	MEDICAL CENTER AREA	Satisfactory	3112829.592	13821963.700
50	115	0.05427	MACGREGOR & BRAESWOOD	Intersection	MEDICAL CENTER AREA	Satisfactory	3112829.592	13821963.700
51	124	0.05218	Hermann Park 2 Bike Rack	Bike Rack	MEDICAL CENTER AREA	Satisfactory	3116039.175	13826117.576
52	126	0.05176	HARRISBURG & DOWLING	Intersection	DOWNTOWN	Satisfactory	3126341.581	13839357.121
53	130	0.04943	VA Medical Ctr Library	LIBRARY	MEDICAL CENTER AREA	Satisfactory	3114273.263	13821885.717
54	136	0.04720	Clayton	LIBRARY	BINZ	Satisfactory	3115528.883	13829331.199
55	147	0.04461	HOLCOMBE & ALMEDA	Intersection	MEDICAL CENTER AREA	Satisfactory	3116022.636	13821852.725
56	150	0.04423	ELGIN & FANNIN	Intersection	MIDTOWN	Satisfactory	3118293.201	13834823.274
57	153	0.04413	ELGIN & LOUISIANA	Intersection	MIDTOWN	Satisfactory	3117172.570	13835554.779
58	175	0.03727	WHEELER & MAIN	Intersection	MIDTOWN	Satisfactory	3116269.368	13832186.630
59	176	0.03727	RICHMOND & MAIN	Intersection	MIDTOWN	Satisfactory	3116217.065	13832222.230
60	180	0.03643	ELGIN & BAGBY	Intersection	MIDTOWN	Satisfactory	3116550.176	13835906.356
61	181	0.03643	WESTHEIMER & BAGBY	Intersection	MIDTOWN	Satisfactory	3116505.182	13835985.137

APPENDIX F: Listing of Recommended Station Locations for Bike Share Program Expansion

62	185	0.03609	Houston Museum of Natural Science	Museums	MEDICAL CENTER AREA	Satisfactory	3114302.495	13827639.186
63	186	0.03609	Hermann Park 1 Bike Rack	Bike Rack	MEDICAL CENTER AREA	Satisfactory	3114120.866	13825242.566
64	207	0.03208	WHEELER & FANNIN	Intersection	MIDTOWN	Satisfactory	3116493.457	13832040.108
65	210	0.03155	LEELAND & DOWLING	Intersection	DOWNTOWN	Satisfactory	3124495.034	13836518.868
66	214	0.03065	WHEELER & CRAWFORD	Intersection	BINZ	Satisfactory	3117878.844	13831151.557
67	224	0.02871	SOUTHMORE & FANNIN	Intersection	BINZ	Satisfactory	3115144.076	13829956.203
68	225	0.02871	SOUTHMORE & MAIN	Intersection	BINZ	Satisfactory	3114873.386	13830134.449
69	230	0.02820	ALABAMA & ALMEDA	Intersection	MIDTOWN	Satisfactory	3118855.070	13832515.916
70	248	0.02645	PRAIRIE & DOWLING	Intersection	DOWNTOWN	Satisfactory	3126485.082	13839596.967
71	258	0.02402	MCKINNEY & DOWLING	Intersection	DOWNTOWN	Satisfactory	3125570.998	13838186.585
72	280	0.01992	ELGIN & CRAWFORD	Intersection	MIDTOWN	Satisfactory	3119683.719	13833931.677
73	290	0.01847	SOUTHMORE & ALMEDA	Intersection	BINZ	Satisfactory	3117721.488	13828293.302
74	291	0.01825	HOUSTON COMMUNITY COLLEGE	University	DOWNTOWN	Satisfactory	3125400.028	13835932.337
75	294	0.01735	BLODGETT & CRAWFORD	Intersection	BINZ	Satisfactory	3117434.606	13830455.197
76	313	0.01316	SOUTHMORE & CRAWFORD	Intersection	BINZ	Satisfactory	3116535.192	13829065.053
77	327	0.00992	BINZ & CRAWFORD	Intersection	BINZ	Satisfactory	3115878.915	13828052.236
78	342	0.00387	Parent Resource Library	LIBRARY	BINZ	Satisfactory	3115607.475	13828228.522
79	9	0.18782	The Museum of Fine Arts	Museums	UNIVERSITY PLACE	Excellent	3113956.919	13829020.070
80	10	0.18431	BISSENET & MAIN	Intersection	UNIVERSITY PLACE	Excellent	3114205.144	13829126.937
81	22	0.14363	RICE UNIVERSITY	University	UNIVERSITY PLACE	Excellent	3112939.405	13827217.570
82	37	0.11856	WASHINGTON & HOUSTON	Intersection	WASHINGTON AVENUE COALITION / MEMORIAL PARK EAST	Excellent	3119221.833	13844375.936
83	42	0.09601	ALABAMA & BAGBY	Intersection	NEARTOWN - MONTROSE	Excellent	3116405.094	13833960.819
84	48	0.08652	ALLEN & WAUGH	Intersection	NEARTOWN - MONTROSE	Excellent	3111079.957	13841946.714
85	50	0.08485	QUITMAN & FULTON	Intersection	NORTHSIDE VILLAGE	Excellent	3122964.931	13849914.245
86	51	0.08485	Carnegie Library	LIBRARY	NORTHSIDE VILLAGE	Excellent	3122854.346	13849855.778
87	52	0.08262	COLLINGSWORTH & IRVINGTON	Intersection	NORTHSIDE VILLAGE	Excellent	3122548.044	13853899.097
88	53	0.08166	Buffalo Bayou Park	Parks	NEARTOWN - MONTROSE	Excellent	3114836.743	13842134.412

APPENDIX F: Listing of Recommended Station Locations for Bike Share Program Expansion

89	58	0.07519	LYONS & ELYSIAN VIADUCT	Intersection	GREATER FIFTH WARD	Excellent	3126102.181	13846151.127
90	59	0.07420	WHEELER & DOWLING	Intersection	GREATER THIRD WARD	Excellent	3120107.385	13829728.494
91	60	0.07336	LYONS & JENSEN	Intersection	GREATER FIFTH WARD	Excellent	3128831.181	13847060.480
92	62	0.07233	POLK & TELEPHONE	Intersection	GREATER EASTWOOD	Excellent	3132096.797	13834164.774
93	63	0.07146	UNIVERSITY-TEXAS HEALTH SCI	University	GREATER FIFTH WARD	Excellent	3134255.024	13848093.219
94	65	0.06982	CLINTON & HIRSCH	Intersection	GREATER FIFTH WARD	Excellent	3133455.709	13844150.144
95	66	0.06910	WASHINGTON & HEIGHTS	Intersection	WASHINGTON AVENUE COALITION / MEMORIAL PARK EAST	Excellent	3111289.910	13844957.452
96	67	0.06873	E.O. Smith Education Center	Parks	GREATER FIFTH WARD	Excellent	3130990.995	13848243.589
97	69	0.06750	LYONS & LOCKWOOD	Intersection	GREATER FIFTH WARD	Excellent	3137120.484	13848268.091
98	73	0.06683	POLK & CULLEN	Intersection	GREATER EASTWOOD	Excellent	3130146.779	13834757.969
99	76	0.06369	HARRISBURG & LOCKWOOD	Intersection	SECOND WARD	Excellent	3133357.845	13836166.692
100	77	0.06304	ELGIN & CULLEN	Intersection	GREATER THIRD WARD	Excellent	3128666.358	13830117.721
101	78	0.06251	WASHINGTON & SHEPHERD	Intersection	WASHINGTON AVENUE COALITION / MEMORIAL PARK EAST	Excellent	3107408.441	13845171.659
102	82	0.06217	POLK & ERNESTINE	Intersection	GREATER EASTWOOD	Excellent	3132447.689	13834051.917
103	83	0.06214	POLK & LOCKWOOD	Intersection	GREATER EASTWOOD	Excellent	3132489.881	13834058.909
104	86	0.06124	HOLCOMBE & KIRBY	Intersection	UNIVERSITY PLACE	Excellent	3105325.875	13821713.277
105	87	0.06115	CAVALCADE & HARDY	Intersection	NORTHSIDE VILLAGE	Excellent	3125117.329	13857691.627
106	88	0.06114	CAVALCADE & FULTON	Intersection	NORTHSIDE VILLAGE	Excellent	3120055.967	13857487.956
107	89	0.06054	WESTHEIMER & SHEPHERD	Intersection	NEARTOWN - MONTROSE	Excellent	3107318.040	13835025.483
108	90	0.05950	LYONS & WACO	Intersection	GREATER FIFTH WARD	Excellent	3133675.459	13848056.976
109	94	0.05913	POLK & YORK	Intersection	GREATER EASTWOOD	Excellent	3128221.983	13835421.613
110	95	0.05913	POLK & SCOTT	Intersection	GREATER EASTWOOD	Excellent	3128128.766	13835396.064
111	96	0.05887	HOLCOMBE & GREENBRIAR	Intersection	UNIVERSITY PLACE	Excellent	3107134.227	13821784.204
112	97	0.05840	WESTHEIMER & WAUGHCREST	Intersection	NEARTOWN - MONTROSE	Excellent	3112873.985	13835956.943
113	98	0.05826	PATTON & IRVINGTON	Intersection	NORTHSIDE VILLAGE	Excellent	3122455.954	13855754.739
114	99	0.05820	WHEELER & CULLEN	Intersection	GREATER THIRD WARD	Excellent	3127354.013	13826840.987
115	103	0.05672	UNIVERSITY & GREENBRIAR	Intersection	UNIVERSITY PLACE	Excellent	3107007.604	13825018.067

APPENDIX F: Listing of Recommended Station Locations for Bike Share Program Expansion

116	104	0.05649	LEELAND & CULLEN	Intersection	GREATER EASTWOOD	Excellent	3129871.804	13833852.847
117	105	0.05623	Marston	LIBRARY	NEARTOWN - MONTROSE	Excellent	3108490.505	13840676.066
118	107	0.05570	UNIVERSITY & KIRBY	Intersection	UNIVERSITY PLACE	Excellent	3105200.341	13824943.949
119	108	0.05551	CAVALCADE & ELYSIAN	Intersection	NORTHSIDE VILLAGE	Excellent	3125428.885	13857710.058
120	110	0.05530	UNIVERSITY OF TEXAS-HOUSTON	University	UNIVERSITY PLACE	Excellent	3108895.292	13821826.645
121	112	0.05462	Rusk Park Bike Rack	Bike Rack	SECOND WARD	Excellent	3128872.462	13839139.753
122	116	0.05410	HARRISBURG & SAMPSON	Intersection	SECOND WARD	Excellent	3129254.778	13837794.012
123	118	0.05255	DALLAS & WAUGH	Intersection	NEARTOWN - MONTROSE	Excellent	3111153.518	13840508.241
124	121	0.05232	LORRAINE & HARDY	Intersection	NORTHSIDE VILLAGE	Excellent	3125747.521	13848558.248
125	122	0.05232	LORRAINE & MOP	Intersection	NORTHSIDE VILLAGE	Excellent	3125747.521	13848558.248
126	123	0.05218	ALLEN & MONTROSE	Intersection	NEARTOWN - MONTROSE	Excellent	3112912.657	13842098.396
127	125	0.05193	CAVALCADE & IRVINGTON	Intersection	NORTHSIDE VILLAGE	Excellent	3122383.104	13857585.783
128	128	0.05035	NAVIGATION & JENSEN	Intersection	SECOND WARD	Excellent	3127750.047	13841721.954
129	129	0.04993	DALLAS & MONTROSE	Intersection	NEARTOWN - MONTROSE	Excellent	3113004.546	13840613.154
130	131	0.04862	UNIVERSITY OF ST THOMAS	University	NEARTOWN - MONTROSE	Excellent	3113559.703	13833797.941
131	132	0.04862	ALABAMA & MONTROSE	Intersection	NEARTOWN - MONTROSE	Excellent	3113563.172	13833832.026
132	133	0.04789	CANAL & SAMPSON	Intersection	SECOND WARD	Excellent	3130297.014	13839408.058
133	134	0.04768	MEMORIAL & SAWYER	Intersection	WASHINGTON AVENUE COALITION / MEMORIAL PARK EAST	Excellent	3117431.221	13842909.785
134	135	0.04762	MACGREGOR & ALMEDA	Intersection	MACGREGOR	Excellent	3116736.521	13824598.940
135	137	0.04692	WASHINGTON & SAWYER	Intersection	WASHINGTON AVENUE COALITION / MEMORIAL PARK EAST	Excellent	3115907.672	13844647.145
136	139	0.04666	HARRISBURG & YORK	Intersection	SECOND WARD	Excellent	3129533.794	13837617.962
137	140	0.04592	NAVIGATION & YORK	Intersection	SECOND WARD	Excellent	3131249.929	13840247.616
138	141	0.04592	NAVIGATION & SAMPSON	Intersection	SECOND WARD	Excellent	3131216.873	13840316.163

APPENDIX F: Listing of Recommended Station Locations for Bike Share Program Expansion

139	142	0.04565	COURTLANDT & BAGBY	Intersection	NEARTOWN - MONTROSE	Excellent	3116462.740	13835662.347
140	143	0.04551	LOVETT & COMMONWEALTH	Intersection	NEARTOWN - MONTROSE	Excellent	3112665.548	13835497.853
141	144	0.04549	ALABAMA & SHEPHERD	Intersection	NEARTOWN - MONTROSE	Excellent	3107375.387	13833560.580
142	149	0.04428	ALLEN & DUNLAVY	Intersection	NEARTOWN - MONTROSE	Excellent	3109779.921	13841162.548
143	155	0.04350	DIXIE & ALMEDA	Intersection	MACGREGOR	Excellent	3116317.889	13822916.068
144	156	0.04327	RICHMOND & DUNLAVY	Intersection	NEARTOWN - MONTROSE	Excellent	3110146.168	13832106.001
145	157	0.04323	QUITMAN & MAIN	Intersection	NORTHSIDE VILLAGE	Excellent	3121754.536	13849363.807
146	158	0.04266	WHEELER & SCOTT	Intersection	GREATER THIRD WARD	Excellent	3126027.457	13827258.168
147	159	0.04257	WASHINGTON & STUDEMONT	Intersection	WASHINGTON AVENUE COALITION / MEMORIAL PARK EAST	Excellent	3113021.657	13844796.431
148	160	0.04248	MCKINNEY & SAMPSON	Intersection	GREATER EASTWOOD	Excellent	3128351.056	13836392.233
149	161	0.04230	MCKINNEY & YORK	Intersection	GREATER EASTWOOD	Excellent	3128623.523	13836215.124
150	162	0.04208	WESTHEIMER & COMMONWEALTH	Intersection	NEARTOWN - MONTROSE	Excellent	3112491.745	13835754.162
151	163	0.04142	WASHINGTON & WAUGHFORD	Intersection	WASHINGTON AVENUE COALITION / MEMORIAL PARK EAST	Excellent	3111018.640	13844980.921
152	164	0.04128	WASHINGTON & WAUGH	Intersection	WASHINGTON AVENUE COALITION / MEMORIAL PARK EAST	Excellent	3110941.230	13844938.037
153	165	0.04128	WASHINGTON & YALE	Intersection	WASHINGTON AVENUE COALITION / MEMORIAL PARK EAST	Excellent	3110947.754	13845033.826
154	166	0.04055	DALLAS & DUNLAVY	Intersection	NEARTOWN - MONTROSE	Excellent	3109815.944	13840421.063
155	173	0.03885	LOVETT & MONTROSE	Intersection	NEARTOWN - MONTROSE	Excellent	3113489.359	13835530.958
156	174	0.03824	GRAY & WAUGH	Intersection	NEARTOWN -	Excellent	3111229.668	13839017.738

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					MONTROSE			
157	178	0.03709	BISSONNET & SHEPHERD	Intersection	UNIVERSITY PLACE	Excellent	3107571.323	13828847.022
158	179	0.03646	MacGregor Park Bike Rack	Bike Rack	MACGREGOR	Excellent	3129950.366	13824245.162
159	183	0.03618	BISSONNET & GREENBRIAR	Intersection	UNIVERSITY PLACE	Excellent	3106853.153	13828813.217
160	184	0.03612	MCKINNEY & LOCKWOOD	Intersection	GREATER EASTWOOD	Excellent	3132730.458	13834934.186
161	187	0.03608	BISSONNET & MONTROSE	Intersection	UNIVERSITY PLACE	Excellent	3113753.991	13829237.995
162	189	0.03574	Turner Park	Parks	UNIVERSITY PLACE	Excellent	3113551.766	13830538.433
163	191	0.03557	Freed-Montrose Library	LIBRARY	NEARTOWN - MONTROSE	Excellent	3113601.285	13832851.875
164	193	0.03547	LIBERTY & WACO	Intersection	GREATER FIFTH WARD	Excellent	3133278.156	13851743.141
165	196	0.03491	MEMORIAL & STUDEMONT	Intersection	WASHINGTON AVENUE COALITION / MEMORIAL PARK EAST	Excellent	3112894.489	13842682.549
166	197	0.03461	LEELAND & LOCKWOOD	Intersection	GREATER EASTWOOD	Excellent	3132431.183	13833131.244
167	198	0.03461	LEELAND & TELEPHONE	Intersection	GREATER EASTWOOD	Excellent	3132431.183	13833131.244
168	199	0.03453	LIBERTY & ALTOONA	Intersection	GREATER FIFTH WARD	Excellent	3133310.562	13851825.586
169	200	0.03403	QUITMAN & HARDY	Intersection	NORTHSIDE VILLAGE	Excellent	3125665.456	13850430.818
170	203	0.03302	RICHMOND & MONTROSE	Intersection	NEARTOWN - MONTROSE	Excellent	3113626.415	13832269.899
171	204	0.03259	MEMORIAL & MEMORIAL SERVICE	Intersection	WASHINGTON AVENUE COALITION / MEMORIAL PARK EAST	Excellent	3107673.098	13841975.772
172	205	0.03259	MEMORIAL & SHEPHERD	Intersection	WASHINGTON AVENUE COALITION / MEMORIAL PARK EAST	Excellent	3107673.098	13841975.772
173	208	0.03181	NAVIGATION & LOCKWOOD	Intersection	SECOND WARD	Excellent	3134735.982	13838970.081
174	209	0.03168	MEMORIAL & HOUSTON	Intersection	WASHINGTON AVENUE COALITION / MEMORIAL PARK EAST	Excellent	3119268.785	13843161.540
175	211	0.03131	ALLEN & KIRBY	Intersection	NEARTOWN - MONTROSE	Excellent	3107920.678	13841256.975
176	213	0.03104	ALLEN & SHEPHERD	Intersection	NEARTOWN - MONTROSE	Excellent	3107883.974	13841343.131

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177	216	0.03043	Dunlavy Park	Bike Rack	NEARTOWN - MONTROSE	Excellent	3110101.932	13831308.834
178	217	0.03036	BLODGETT & ENNIS	Intersection	MACGREGOR	Excellent	3121321.757	13827955.797
179	218	0.03032	ALABAMA & DUNLAVY	Intersection	NEARTOWN - MONTROSE	Excellent	3110135.263	13833681.211
180	219	0.03026	MACGREGOR & SCOTT	Intersection	MACGREGOR	Excellent	3124831.916	13823465.988
181	220	0.03017	MCKINNEY & TELEPHONE	Intersection	GREATER EASTWOOD	Excellent	3131441.846	13835337.674
182	221	0.02904	GRAY & MONTROSE	Intersection	NEARTOWN - MONTROSE	Excellent	3113099.479	13839111.915
183	222	0.02878	HOGAN & FULTON	Intersection	NORTHSIDE VILLAGE	Excellent	3123721.005	13848248.810
184	223	0.02877	WHEELER & ALMEDA	Intersection	GREATER THIRD WARD	Excellent	3118396.777	13830829.259
185	226	0.02862	ALABAMA & DOWLING	Intersection	GREATER THIRD WARD	Excellent	3121008.437	13831125.565
186	227	0.02856	GRAY & SHEPHERD	Intersection	NEARTOWN - MONTROSE	Excellent	3107216.988	13838813.366
187	228	0.02852	QUITMAN & ELYSIAN	Intersection	NORTHSIDE VILLAGE	Excellent	3125926.545	13850441.215
188	231	0.02808	RICE & SHEPHERD	Intersection	UNIVERSITY PLACE	Excellent	3108142.647	13826310.479
189	232	0.02787	CROCKETT & HOUSTON	Intersection	WASHINGTON AVENUE COALITION / MEMORIAL PARK EAST	Excellent	3119127.556	13846721.562
190	236	0.02774	CANAL & LOCKWOOD	Intersection	SECOND WARD	Excellent	3133946.990	13837794.703
191	237	0.02767	TEXAS SOUTHERN UNIVERSITY	University	GREATER THIRD WARD	Excellent	3122560.456	13829124.337
192	238	0.02767	Robert James Terry Library	LIBRARY	GREATER THIRD WARD	Excellent	3122563.002	13829124.056
193	239	0.02767	ThurExcellent Marshall Law Library	LIBRARY	GREATER THIRD WARD	Excellent	3122563.002	13829124.056
194	240	0.02734	GRAY & DUNLAVY	Intersection	NEARTOWN - MONTROSE	Excellent	3109880.261	13838949.288
195	241	0.02731	LAWNDALE & TELEPHONE	Intersection	GREATER EASTWOOD	Excellent	3134256.626	13830986.550
196	242	0.02667	Cherryhurst Park Bike Rack	Bike Rack	NEARTOWN - MONTROSE	Excellent	3111133.471	13835639.622
197	244	0.02663	DALLAS & SHEPHERD	Intersection	NEARTOWN - MONTROSE	Excellent	3107896.624	13840337.084
198	245	0.02657	SOUTHMORE & SCOTT	Intersection	MACGREGOR	Excellent	3125064.884	13824240.082
199	246	0.02652	SOUTHMORE & ENNIS	Intersection	MACGREGOR	Excellent	3120421.162	13826562.298

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200	247	0.02648	CANAL & YORK	Intersection	SECOND WARD	Excellent	3130575.558	13839228.384
201	249	0.02591	SOUTHMORE & DOWLING	Intersection	MACGREGOR	Excellent	3118752.595	13827630.061
202	250	0.02572	WESTHEIMER & MONTROSE	Intersection	NEARTOWN - MONTROSE	Excellent	3113470.580	13835974.106
203	251	0.02544	Flores Library	LIBRARY	SECOND WARD	Excellent	3131293.304	13838815.730
204	256	0.02417	LORRAINE & JENSEN	Intersection	GREATER FIFTH WARD	Excellent	3128760.291	13848785.588
205	261	0.02370	QUITMAN & JENSEN	Intersection	GREATER FIFTH WARD	Excellent	3128687.055	13850582.439
206	263	0.02357	MACGREGOR & CULLEN	Intersection	MACGREGOR	Excellent	3127022.416	13824000.470
207	264	0.02312	ALABAMA & ENNIS	Intersection	GREATER THIRD WARD	Excellent	3122672.600	13830045.304
208	266	0.02280	Finnegan Park	Parks	GREATER FIFTH WARD	Excellent	3135949.738	13845514.961
209	267	0.02235	RICE & GREENBRIAR	Intersection	UNIVERSITY PLACE	Excellent	3106969.090	13825884.361
210	268	0.02219	Riverside Park	Parks	MACGREGOR	Excellent	3119578.255	13825894.424
211	269	0.02171	LEELAND & SCOTT	Intersection	GREATER EASTWOOD	Excellent	3127941.361	13834457.882
212	270	0.02131	ALABAMA & SCOTT	Intersection	GREATER THIRD WARD	Excellent	3126489.574	13828760.721
213	271	0.02116	ELGIN & SCOTT	Intersection	GREATER THIRD WARD	Excellent	3126781.939	13830263.337
214	272	0.02100	Smith Library	LIBRARY	GREATER THIRD WARD	Excellent	3126436.342	13828637.182
215	273	0.02082	BLODGETT & DOWLING	Intersection	MACGREGOR	Excellent	3119657.076	13829030.266
216	274	0.02065	SAN FELIPE & SHEPHERD	Intersection	NEARTOWN - MONTROSE	Excellent	3107265.281	13837384.461
217	275	0.02065	SAN FELIPE & VERMONT	Intersection	NEARTOWN - MONTROSE	Excellent	3107265.281	13837384.461
218	276	0.02033	COLLINGSWORTH & FULTON	Intersection	NORTHSIDE VILLAGE	Excellent	3121964.203	13853836.946
219	277	0.02025	RICE & KIRBY	Intersection	UNIVERSITY PLACE	Excellent	3105158.221	13825809.405
220	278	0.02021	BISSONNET & DUNLAVY	Intersection	UNIVERSITY PLACE	Excellent	3110251.543	13828975.297
221	279	0.02003	Sabine Park Bike Rack	Bike Rack	FOURTH WARD	Excellent	3118235.606	13841941.687
222	283	0.01911	HOGAN & MAIN	Intersection	NORTHSIDE VILLAGE	Excellent	3122518.293	13847687.860
223	284	0.01904	ELGIN & DOWLING	Intersection	GREATER THIRD WARD	Excellent	3121909.796	13832522.838
224	286	0.01878	Emancipation Park	Parks	GREATER THIRD WARD	Excellent	3121851.450	13833035.351
225	287	0.01862	COLLINGSWORTH & LOCKWOOD	Intersection	GREATER FIFTH WARD	Excellent	3136717.525	13854531.756
226	288	0.01860	GRIGGS & SCOTT	Intersection	MACGREGOR	Excellent	3124320.449	13821791.161
227	293	0.01751	BINZ & DOWLING	Intersection	MACGREGOR	Excellent	3118243.590	13826831.396
228	295	0.01712	HARRISBURG & PAIGE	Intersection	SECOND WARD	Excellent	3127917.841	13838930.969

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229	296	0.01711	LEELAND & ERNESTINE	Intersection	GREATER EASTWOOD	Excellent	3131754.405	13833283.110
230	297	0.01709	BLODGETT & SCOTT	Intersection	MACGREGOR	Excellent	3125701.093	13826229.963
231	298	0.01703	Fifth Ward Library	LIBRARY	GREATER FIFTH WARD	Excellent	3132435.792	13846717.236
232	299	0.01675	WESTHEIMER & DUNLAVY	Intersection	NEARTOWN - MONTROSE	Excellent	3110062.972	13835182.227
233	300	0.01655	WHEELER & MARTIN LUTHER KING	Intersection	GREATER THIRD WARD	Excellent	3130113.417	13825921.739
234	301	0.01655	WHEELER & CALHOUN	Intersection	GREATER THIRD WARD	Excellent	3130051.045	13825984.304
235	302	0.01637	COLLINGSWORTH & HARDY	Intersection	NORTHSIDE VILLAGE	Excellent	3125317.200	13854003.220
236	304	0.01609	MEMORIAL & WAUGH	Intersection	WASHINGTON AVENUE COALITION / MEMORIAL PARK EAST	Excellent	3110820.861	13842891.586
237	305	0.01593	LORRAINE & ELYSIAN	Intersection	NORTHSIDE VILLAGE	Excellent	3126003.419	13848623.717
238	306	0.01510	MACGREGOR & CALHOUN	Intersection	MACGREGOR	Excellent	3129627.329	13824592.749
239	308	0.01484	COLLINGSWORTH & ELYSIAN	Intersection	NORTHSIDE VILLAGE	Excellent	3125628.847	13854017.527
240	309	0.01450	PATTON & FULTON	Intersection	NORTHSIDE VILLAGE	Excellent	3120263.548	13855652.607
241	311	0.01386	CLINTON & JENSEN	Intersection	GREATER FIFTH WARD	Excellent	3128563.575	13843710.624
242	312	0.01337	COLLINGSWORTH & JENSEN	Intersection	GREATER FIFTH WARD	Excellent	3128510.794	13854294.230
243	314	0.01276	Eastwood Park	Parks	SECOND WARD	Excellent	3134138.650	13835655.018
244	315	0.01227	MACGREGOR & ENNIS	Intersection	MACGREGOR	Excellent	3120017.078	13825096.204
245	316	0.01219	WHEELER & ENNIS	Intersection	GREATER THIRD WARD	Excellent	3121771.102	13828655.004
246	318	0.01213	ELGIN & LOCKWOOD	Intersection	GREATER THIRD WARD	Excellent	3130515.700	13829793.790
247	321	0.01100	BINZ & ALMEDA	Intersection	MACGREGOR	Excellent	3117403.408	13827082.355
248	322	0.01087	Pearland Library	LIBRARY	GREATER FIFTH WARD	Excellent	3130913.381	13851137.143
249	323	0.01038	BLODGETT & ALMEDA	Intersection	MACGREGOR	Excellent	3118170.718	13829979.183
250	324	0.01028	LIBERTY & LOCKWOOD	Intersection	GREATER FIFTH WARD	Excellent	3136865.435	13852442.593
251	325	0.01005	Peggy Park	Parks	GREATER THIRD WARD	Excellent	3118940.665	13830972.146
252	326	0.00997	CLINTON & LOCKWOOD	Intersection	GREATER FIFTH WARD	Excellent	3137277.771	13843615.823
253	330	0.00974	Swiney Park	Parks	GREATER FIFTH WARD	Excellent	3129381.063	13844576.560
254	331	0.00947	CROCKETT & SAWYER	Intersection	WASHINGTON AVENUE COALITION / MEMORIAL PARK EAST	Excellent	3115870.358	13846588.234
255	332	0.00893	ELGIN & ENNIS	Intersection	GREATER THIRD WARD	Excellent	3123569.798	13831438.726

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256	333	0.00795	University of Houston Bike Rack	Bike Rack	GREATER THIRD WARD	Excellent	3129741.992	13827625.773
257	334	0.00762	UNIVERSITY OF HOUSTON	University	GREATER THIRD WARD	Excellent	3130266.553	13827077.572
258	335	0.00676	Spotts Park	Parks	WASHINGTON AVENUE COALITION / MEMORIAL PARK EAST	Excellent	3112045.020	13843431.041
259	337	0.00673	GRIGGS & OLD SPANISH	Intersection	MACGREGOR	Excellent	3126281.055	13821170.528
260	338	0.00663	Moody Park	Parks	NORTHSIDE VILLAGE	Excellent	3121193.021	13853805.905
261	343	0.00243	Tuffly Park	Parks	GREATER FIFTH WARD	Excellent	3131260.356	13853519.646
262	344	0.00237	HOLCOMBE & OLD SPANISH	Intersection	MACGREGOR	Excellent	3119756.015	13820440.560
263	345	0.00221	Mac Gregor Park	Parks	MACGREGOR	Excellent	3131341.996	13824286.994
264	346	0.00221	MACGREGOR & MARTIN LUTHER KING	Intersection	MACGREGOR	Excellent	3130912.095	13824438.587
265	39	0.10112	Grady Park Bike Rack	Bike Rack	GREATER UPTOWN	Optimal	3088234.992	13836636.919
266	49	0.08644	WESTPARK & WESLAYAN	Intersection	GREENWAY / UPPER KIRBY AREA	Optimal	3097760.494	13829335.553
267	54	0.08005	WESTHEIMER & YORKTOWN	Intersection	GREATER UPTOWN	Optimal	3088348.772	13833217.099
268	56	0.07851	WESTPARK & EDLOE	Intersection	GREENWAY / UPPER KIRBY AREA	Optimal	3100268.418	13829518.338
269	57	0.07578	WESTHEIMER & WESLAYAN	Intersection	GREENWAY / UPPER KIRBY AREA	Optimal	3097515.865	13834406.020
270	61	0.07274	ALABAMA & YORKTOWN	Intersection	GREATER UPTOWN	Optimal	3088371.393	13832776.611
271	64	0.07045	Looscan Library	LIBRARY	AFTON OAKS / RIVER OAKS AREA	Optimal	3097504.294	13834719.568
272	70	0.06726	WESTHEIMER & FOUNTAIN VIEW	Intersection	GREATER UPTOWN	Optimal	3084037.542	13832586.192
273	71	0.06697	RICHMOND & WESLAYAN	Intersection	GREENWAY / UPPER KIRBY AREA	Optimal	3097675.555	13831114.384
274	74	0.06489	WESTPARK & BUFFALO SPEEDWAY	Intersection	GREENWAY / UPPER KIRBY AREA	Optimal	3102013.450	13829692.106
275	75	0.06416	BELLAIRE & RENWICK	Intersection	GULFTON	Optimal	3084283.326	13820844.871
276	79	0.06247	WASHINGTON & DURHAM	Intersection	WASHINGTON AVENUE COALITION / MEMORIAL PARK WEST	Optimal	3107053.245	13845158.732
277	81	0.06235	ALABAMA & WESLAYAN	Intersection	GREENWAY / UPPER	Optimal	3097573.773	13833134.385

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					KIRBY AREA			
278	84	0.06157	SAN FELIPE & YORKTOWN	Intersection	GREATER UPTOWN	Optimal	3088159.312	13837172.276
279	85	0.06129	ALABAMA & EDLOE	Intersection	GREENWAY / UPPER KIRBY AREA	Optimal	3100137.718	13833248.500
280	91	0.05945	WESTPARK & NEWCASTLE	Intersection	GREENWAY / UPPER KIRBY AREA	Optimal	3094515.637	13828930.163
281	93	0.05914	GULFTON & RENWICK	Intersection	GULFTON	Optimal	3084109.133	13824802.342
282	100	0.05777	WOODWAY & POST OAK	Intersection	GREATER UPTOWN	Optimal	3090405.347	13841675.680
283	106	0.05579	ALABAMA & KIRBY	Intersection	GREENWAY / UPPER KIRBY AREA	Optimal	3104821.468	13833455.581
284	109	0.05542	SAN FELIPE & SAGE	Intersection	GREATER UPTOWN	Optimal	3089315.603	13837245.076
285	111	0.05529	HIDALGO & YORKTOWN	Intersection	GREATER UPTOWN	Optimal	3088223.479	13831762.195
286	113	0.05453	RICHMOND & POST OAK	Intersection	GREATER UPTOWN	Optimal	3091594.017	13830679.572
287	117	0.05345	WESTHEIMER & SAGE	Intersection	GREATER UPTOWN	Optimal	3089512.108	13833706.232
288	119	0.05253	SAN FELIPE & POST OAK	Intersection	GREATER UPTOWN	Optimal	3090937.588	13837316.217
289	120	0.05237	WESTHEIMER & POST OAK	Intersection	GREATER UPTOWN	Optimal	3091424.853	13833907.479
290	127	0.05040	SAN FELIPE & FOUNTAIN VIEW	Intersection	GREATER UPTOWN	Optimal	3083352.868	13836951.277
291	138	0.04679	ALABAMA & POST OAK	Intersection	GREATER UPTOWN	Optimal	3091528.865	13832850.832
292	145	0.04499	ALABAMA & SAGE	Intersection	GREATER UPTOWN	Optimal	3089588.572	13832827.515
293	146	0.04494	WASHINGTON & T C JESTER	Intersection	WASHINGTON AVENUE COALITION / MEMORIAL PARK WEST	Optimal	3104876.862	13845170.001
294	148	0.04443	HIDALGO & POST OAK	Intersection	GREATER UPTOWN	Optimal	3091574.835	13831906.472
295	151	0.04423	RICE & SAGE	Intersection	GREATER UPTOWN	Optimal	3089291.372	13828921.266
296	152	0.04415	RICHMOND & YORKTOWN	Intersection	GREATER UPTOWN	Optimal	3088098.432	13830421.334
297	154	0.04352	RICHMOND & SAGE	Intersection	GREATER UPTOWN	Optimal	3089709.986	13830481.813
298	167	0.04039	WESTHEIMER & CHIMNEY ROCK	Intersection	GREATER UPTOWN	Optimal	3086478.790	13832702.183
299	168	0.04032	WOODWAY & SAGE	Intersection	GREATER UPTOWN	Optimal	3089031.667	13841870.564
300	169	0.04018	WESTHEIMER & EDLOE	Intersection	AFTON OAKS / RIVER OAKS AREA	Optimal	3100012.596	13834459.185
301	170	0.03993	WESTHEIMER & KIRBY	Intersection	GREENWAY / UPPER KIRBY AREA	Optimal	3104767.946	13834849.980
302	171	0.03977	RICHMOND & CHIMNEY ROCK	Intersection	GREATER UPTOWN	Optimal	3086598.766	13830365.151

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303	172	0.03900	RICHMOND & NEWCASTLE	Intersection	AFTON OAKS / RIVER OAKS AREA	Optimal	3094252.001	13831036.504
304	177	0.03718	ALABAMA & BUFFALO SPEEDWAY	Intersection	GREENWAY / UPPER KIRBY AREA	Optimal	3101262.893	13833294.202
305	182	0.03625	MEMORIAL & ANTOINE	Intersection	GREATER UPTOWN	Optimal	3086397.634	13847636.234
306	188	0.03590	RICHMOND & SHEPHERD	Intersection	GREENWAY / UPPER KIRBY AREA	Optimal	3107435.406	13831992.911
307	190	0.03559	RICHMOND & EDLOE	Intersection	GREENWAY / UPPER KIRBY AREA	Optimal	3100216.011	13831315.592
308	192	0.03555	HIDALGO & SAGE	Intersection	GREATER UPTOWN	Optimal	3089632.355	13831876.365
309	194	0.03509	MEMORIAL & CHIMNEY ROCK	Intersection	GREATER UPTOWN	Optimal	3083654.530	13846983.067
310	195	0.03507	MEMORIAL & SILBER	Intersection	GREATER UPTOWN	Optimal	3088768.862	13847867.033
311	201	0.03397	HIDALGO & CHIMNEY ROCK	Intersection	GREATER UPTOWN	Optimal	3086530.236	13831817.705
312	202	0.03368	RICHMOND & BUFFALO SPEEDWAY	Intersection	GREENWAY / UPPER KIRBY AREA	Optimal	3101534.680	13831676.429
313	206	0.03241	Goethe Institute-German Ctr	LIBRARY	GREENWAY / UPPER KIRBY AREA	Optimal	3102676.277	13830558.999
314	212	0.03122	WESTPARK & FOUNTAIN VIEW	Intersection	GULFTON	Optimal	3084214.919	13827730.486
315	215	0.03051	RICHMOND & KIRBY	Intersection	GREENWAY / UPPER KIRBY AREA	Optimal	3104883.566	13831867.936
316	229	0.02832	Levy Park Bike Rack	Bike Rack	GREENWAY / UPPER KIRBY AREA	Optimal	3103437.886	13831209.779
317	233	0.02786	BISSONNET & CHIMNEY ROCK	Intersection	GULFTON	Optimal	3086963.605	13820148.648
318	234	0.02781	BISSONNET & KIRBY	Intersection	GREENWAY / UPPER KIRBY AREA	Optimal	3105019.579	13828734.844
319	235	0.02778	WOODWAY & CHIMNEY ROCK	Intersection	GREATER UPTOWN	Optimal	3085768.075	13842082.145
320	243	0.02666	WESTPARK & KIRBY	Intersection	GREENWAY / UPPER KIRBY AREA	Optimal	3104961.836	13829862.579
321	252	0.02513	Jungman Library	LIBRARY	GREATER UPTOWN	Optimal	3084994.273	13832656.550
322	253	0.02464	River Oaks Park Bike Rack	Bike Rack	AFTON OAKS / RIVER OAKS AREA	Optimal	3099497.185	13834558.057
323	254	0.02460	WESTHEIMER & BUFFALO SPEEDWAY	Intersection	GREENWAY / UPPER KIRBY AREA	Optimal	3101201.943	13834641.704
324	255	0.02418	BELLAIRE & CHIMNEY ROCK	Intersection	GULFTON	Optimal	3086929.887	13820946.696

APPENDIX F: Listing of Recommended Station Locations for Bike Share Program Expansion

325	257	0.02416	BELLAIRE & HILLCROFT	Intersection	GULFTON	Optimal	3081611.748	13820736.251
326	259	0.02385	WOODWAY & FOUNTAIN VIEW	Intersection	GREATER UPTOWN	Optimal	3083214.866	13840089.648
327	260	0.02377	MEMORIAL & WESTCOTT	Intersection	WASHINGTON AVENUE COALITION / MEMORIAL PARK WEST	Optimal	3103693.236	13841739.795
328	262	0.02358	SAN FELIPE & CHIMNEY ROCK	Intersection	GREATER UPTOWN	Optimal	3086225.391	13837101.954
329	265	0.02293	SAN FELIPE & KIRBY	Intersection	AFTON OAKS / RIVER OAKS AREA	Optimal	3104689.654	13837061.448
330	281	0.01977	WOODWAY & VOSS	Intersection	GREATER UPTOWN	Optimal	3078517.699	13838363.978
331	282	0.01919	Burnett Bayland Park Bike Rack	Bike Rack	GULFTON	Optimal	3085600.417	13823944.771
332	285	0.01892	SAN FELIPE & VOSS	Intersection	GREATER UPTOWN	Optimal	3078566.571	13837005.113
333	289	0.01852	GULFTON & CHIMNEY ROCK	Intersection	GULFTON	Optimal	3086767.943	13824919.084
334	292	0.01792	MEMORIAL & POST OAK	Intersection	GREATER UPTOWN	Optimal	3092440.190	13845758.844
335	303	0.01635	WESTPARK & RENWICK	Intersection	GULFTON	Optimal	3084190.037	13827665.408
336	307	0.01505	OLD KATY & HEMPSTEAD	Intersection	WASHINGTON AVENUE COALITION / MEMORIAL PARK WEST	Optimal	3098591.849	13849246.396
337	310	0.01422	WASHINGTON & COPPAGE	Intersection	WASHINGTON AVENUE COALITION / MEMORIAL PARK WEST	Optimal	3102432.377	13846079.315
338	317	0.01217	HOUSTON COMMUNITY COLLEGE	University	GULFTON	Optimal	3087273.533	13824907.208
339	319	0.01191	BISSONNET & WESLAYAN	Intersection	GREENWAY / UPPER KIRBY AREA	Optimal	3097875.918	13826987.956
340	320	0.01168	WASHINGTON & HEMPSTEAD	Intersection	WASHINGTON AVENUE COALITION / MEMORIAL PARK WEST	Optimal	3098777.418	13848680.014
341	328	0.00981	KATY & HEMPSTEAD	Intersection	WASHINGTON AVENUE COALITION / MEMORIAL PARK WEST	Optimal	3098173.375	13848740.373
342	329	0.00975	WESTPARK & CHIMNEY ROCK	Intersection	GULFTON	Optimal	3086653.939	13827969.701
343	336	0.00676	WASHINGTON & WESTCOTT	Intersection	WASHINGTON AVENUE COALITION / MEMORIAL PARK WEST	Optimal	3101256.584	13847307.307

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344	339	0.00475	Memorial Park Eastside Bike Rack	Bike Rack	WASHINGTON AVENUE COALITION / MEMORIAL PARK WEST	Optimal	3100969.517	13845346.134
345	340	0.00469	Memorial Park	Parks	WASHINGTON AVENUE COALITION / MEMORIAL PARK WEST	Optimal	3098568.334	13845359.913
346	341	0.00469	Memorial Park Central Bike Rack	Bike Rack	WASHINGTON AVENUE COALITION / MEMORIAL PARK WEST	Optimal	3095980.518	13844435.427