



# Raleigh **BikeShare** Implementation Plan

Fall 2014



[bikeraleigh.org](http://bikeraleigh.org)





# ACKNOWLEDGMENTS

The City of Raleigh would like to thank the following individuals for their assistance and contributions to the completion of this report:

## **City of Raleigh:**

Office of Transportation Planning

- Jennifer Baldwin, Project Manager
- Eric Lamb, PE
- Amanda Driscoll

Urban Design Center

- Grant Meacci, PLA
- Carter Pettibone, AICP

Public Works Department

- Mike Kennon, PE
- Kathy Molin

Planning & Development

- Christine Darges
- Jorge Gao

## **North Carolina State University:**

- Michael Ousdahl

## **Downtown Raleigh Alliance:**

- David Diaz

## **Raleigh Bicycle & Pedestrian Advisory Commission:**

- Mike Dayton, Chair
- Amy Simes, Vice Chair
- Alan Wiggs
- Charlotte Mitchell
- Sig Hutchinson
- Dr. Linda Butler
- Aaron Peeler
- Paul Nevill
- Harry Johnson

## **Consultants:**

Toole Design Group, LLC

- RJ Eldridge
- Alison Cohen
- Adrian Witte, PE
- Mauricio Hernandez, MCP
- Benjamin Sigrist

Vanasse Hangen Brustlin, Inc.

- Timothy Tresolavy, AICP, GISP
- Joseph L Lewis

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# EXECUTIVE SUMMARY

This Business Plan builds upon the findings of the City of Raleigh Bike Share Feasibility Study completed in Spring 2014, which found the implementation of a bike share program to be FEASIBLE based on the proposed goals and objectives and existing conditions described in the Feasibility Study.

## System Plan

System boundaries were developed to capture contiguous areas with the highest potential for bike share. The number of stations needed to provide coverage to this area was developed based on typical station densities in peer cities. Consequentially the proposed service area was divided into various phases to represent realistic capital funding capacity (so as not to plan a system that was too large to realistically be funded).

**Figure 1** below shows the resulting service area and phasing map for the bike share system. When fully implemented the proposed 50 station and 500 bicycle system is expected to serve downtown Raleigh, North Carolina State University, and the neighborhoods of Mordecai, Cameron Village, Five Points, College Park, North Central, Hillsborough, Wade, and parts of East Raleigh. Overall, the system would serve approximately 12 percent of City residents and 45 percent of all jobs.

As a system that is too small or that provides stations that are too far apart, limits its effectiveness, the proposed service area of nine square miles in Phase 1 represents a sizeable network providing effective service between a mix of trip origins and destinations.

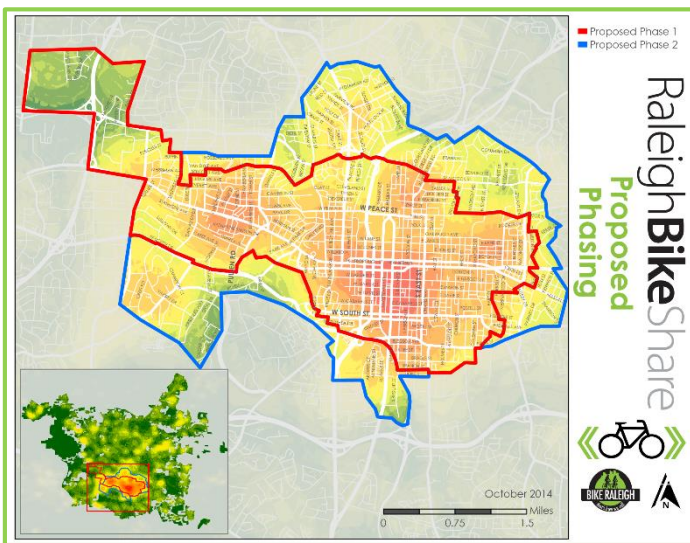


Figure 1 - Proposed Phasing

## Phase One (30 stations / 300 bicycles)

Phase 1 includes 30 stations located in the Downtown and extending west to North Carolina State University (NCSU). This phase includes some bike share stations in predominantly low income and/or minority neighborhoods to help provide an affordable transportation option for residents in these areas. Under this proposed phasing, Downtown Raleigh would include 12 stations at a density of 8.4 stations per square mile.

## Phase Two (20 stations / 200 bicycles)

Phase 2 includes 20 stations extending north and south of Downtown Raleigh and south west to the NCSU Centennial Campus and surrounding areas. This phase will also include some infill stations within the Phase 1 area. When complete, this phase will serve an additional area of approximately 9.8 square miles at a density of 2.0 stations per square mile. A lower density of stations in this area is reflective of the generally lower density of land use.

## Business Model Evaluation

A key outcome for this Study was to select a governance structure for the proposed program. In general, the following functions are required to mobilize and operate a bike share system:

- Obtain political, public, and other support.
- Raise funds for initial capital and early operating costs.
- Procure the equipment vendor and the operator.
- Administer contracts with the equipment vendor and the operator.
- Own and maintain the system and its assets.
- Evaluate and expand the system.

These functions can be undertaken by one or more organizations. Existing U.S. bike share programs operate under different business models depending on the jurisdiction's funding environment, institutional capacity, and local transportation needs. Each model was reviewed in detail and an evaluation of the role of public agencies, non-profit organizations, and the private sector in owning and managing a potential bike share program in Raleigh as provided. The evaluation considers a number of criteria including key operating parameters and local priorities identified in the Feasibility Study. The evaluation criteria included:

- Who will own the system?
- Who will be responsible for raising capital funds?
- Who will operate the system and be responsible for covering operating costs?
- What potential funding sources are available under this business model?
- What is the organizational capacity and interest for this model?
- Does the model allow for regional expansion?
- How does the model meet the goals and objectives for the system?

The evaluation shows that the preferred structure is a **City-owned system that is privately operated**. A City-owned system would:

- Maximize the City of Raleigh's control over all aspects of the system – from creating a financially sustainable system to meeting the specific goals outlined in the Feasibility Study;
- Allow for the most time-efficient mobilization of a system for Raleigh;
- Leverage the organizational interest and capacity that currently exists in the City;
- Leverage the significant funding potential for the City;
- Bring in private operations to maximize system quality and maintenance;
- Lower the implementation risk, as many cities around the country have successfully implemented this structure; and
- Leverage the public relations capabilities and local partnerships held by the City to maximize the economic benefit of bike share to the City.

### Financial Analysis

The financial pro-forma includes a five year evaluation of expected program costs and revenues starting from when the City signs a contract with a private operator. The pro-forma includes numerous inputs. Where these variables were unknown, information was gathered from membership, ridership and financial data for the comparable cities for this study. The system sizes and phasing recommended mentioned above were used to develop the financial pro-forma.

To estimate capital funding required to implement the bike share system, equipment costs (based on costs from existing station-based systems), system startup and station installation costs were utilized. Further, operating costs were estimated using per-docking point estimates from comparable bike share systems. Finally, revenue and ridership were

estimated using membership and ridership metrics from comparable systems, as well as the proposed cost rates in the table below:

**Table 1 - Suggested Fee Schedule for Raleigh Bike Share**

	Access Fee	Usage Fees	
		0-30 mins	Additional Half Hours
<b>Annual</b>	\$80		
<b>24-hour</b>	\$8	\$0.00	\$4.00
<b>Student</b>	\$50	\$0.00	\$2.00

It is also recommended that other pricing structures be considered, e.g., a monthly fee instead of annual membership (a model similar to cell phone plans) and / or a "per ride" trip fee similar to how transit is priced. Nevertheless, for this analysis, the traditional pricing structure has been assumed as there is significant data to support related membership and ridership assumptions using this structure.

Using the inputs above, the pro-forma was prepared to forecast membership, ridership, capital and installation costs, annual operating costs and system revenues, as shown in **Table 10** of this report. A summary of the five year funding need for implementation of the five phase initial bike share system in Raleigh includes:

- Capital and Installation Costs: \$2.6 million (\$1.6 million for Phase 1 / system startup and \$1.0 million for Phase 2) that includes capital, installation and system startup costs.
- Operating Costs: \$4.5 million to operate for the first five years. This includes operating costs and system upkeep. For Phase 1 system only, \$3.2 million over 5 years.
- Revenue: \$1.5 million earned in membership sales and trip fees during the first five years of operation. For Phase 1 system only, \$1.1 million over five years.
- Operating Fundraising Need: \$2.9 million over five years for the full system, \$2.1 million for Phase 1 only. This represents an average of \$425,000 per year for Phase 1 only, or \$1,400 per bike per year.

### Implementation Considerations

During the stakeholder and public process, it was emphasized that a bike share system in Raleigh should be designed to serve a large cross-section of the population and neighborhoods outside the Center City core. To achieve the goal of equity for Raleigh, some existing strategies used in other cities should be employed, and some new ones implemented, including

- Locating stations in lower income and minority communities: the recommended system map includes weighting of census tracts of low-income communities. Within the proposed phasing 28 percent of all stations would be installed in low income and minority areas. Additionally, when fully implemented, the proposed 50 station system would serve approximately 15 percent of all minority communities in the City.
- Providing subsidized discounted memberships for qualified people.
- Increasing access to those without credit cards.

- Dedicating a budget for marketing and outreach, as well as identifying local champions and community organizations as partners in this program.
- Creating a jobs program associated with the bike share system.

### Implementation Timeline

Following is a potential implementation timeline for a bike share system for Raleigh, showing a total timeline to launch of Phase 1 of approximately 18 months:

Critical Path Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Decision on governance structure and funding plan																		
Identify funds for system installation, equipment and operations, including sponsorship																		
Develop procurement documents																		
Issue Request for Proposals for equipment and/or operations																		
Award and sign contract for equipment and/or operations																		
Site planning and community outreach																		
System manufacture, preparation for operations, installation and launch																		



## INTRODUCTION

This business plan builds upon the findings of the City of Raleigh Bike Share Feasibility Study completed in Spring 2014, which found the implementation of a bike share program to be feasible based on the proposed goals and objectives described in the Feasibility Study.

This recommendation was based on a positive analysis of existing conditions which are conducive to bike share implementation. The Feasibility Study also found that the areas of the City with the highest potential for bike share include:

- Downtown
- Universities & Colleges
- Hillsborough Street Corridor
- Mordecai Neighborhood
- Cameron Village
- Glenwood South
- Chavis Park Area

These locations offer the highest potential demand for bike share due to their mix and concentration of jobs, housing and activities.

This Business and Implementation Plan builds on the findings of the Feasibility Study. It includes details on the siting and permitting of bike share stations, analyzes and recommends a governance and ownership structure, performs a financial analysis that compares system costs and revenues and identifies potential funding sources to meet the shortfall; provides an assessment of possible station locations for the first two phases of the system; and offers an account of other implementation considerations.

This report has been organized into six sections. The first section outlines the proposed system phasing plan and generalized station locations.

Sections two and three provide general guidelines for the siting and permitting of stations. These were developed from standards from peer cities and in collaboration with the City's Engineering Department.

Sections four and five provide a full exploration of the recommended business model and a financial analysis of projected costs and revenues for the proposed bike share program. Finally, section six explores additional considerations for the City

related to the implementation of the bike share program.



Credit: Nice Ride

# SYSTEM PLAN

This section summarizes the methodology and recommendations for the size, phasing, and service area of a potential bike share system in the City of Raleigh.

## SERVICE AREA AND PHASING

Areas where bike share is likely to be most successful in Raleigh were defined in the Feasibility Study based on feedback received from the community engagement process and a heat mapping analysis that looked at existing population and employment densities, the location of attractions, existing transit and bicycling infrastructure, and the concentration of minority and low-income populations (please refer to the Feasibility Study for more information).

System boundaries were developed to capture contiguous areas with the highest potential for bike share. Based on typical station densities in peer cities, the number of stations needed to cover this area was developed and then broken into phases to represent realistic capital funding capacity (so as not to plan a system that was too large to realistically be funded).

**Figure 2** shows the resulting service area and phasing map for the bike share system. When fully implemented the proposed 50 station and 500 bicycle system is expected to serve downtown Raleigh, North Carolina State University, and the neighborhoods of Mordecai, Cameron Village, Five Points, College Park, North Central, Hillsborough, Wade, and parts of East Raleigh. Overall, the system would serve approximately 12 percent of City residents<sup>1</sup> and 45 percent of all jobs.<sup>2</sup>

The proposed service area for Phase 1 is around 7 square miles and represents a sizeable network providing effective service between a mix of trip origins and destinations. A system that is too small or that provides stations that are too far apart, limits its effectiveness. To support this, the following station planning principles were applied:

- **Minimize distance between stations:** All proposed station locations are within a maximum distance of ½ mile apart to minimize the time and distance that a potential user would need to travel to access the system.
- **Variety of origins and destinations:** Proposed stations are located in areas of the city with

a variety of land uses to provide both origins and destinations for trips.

## STATION DENSITY

The average station density for the fully implemented system is 3.3 stations per square mile (i.e., 50 stations in a 16.5 square mile coverage area). The size of each phase, i.e., the number of stations and bicycles in each, was developed system-wide station densities and stations sizes observed in peer cities.

System-wide station densities in peer cities range from two to ten stations per square mile (see **Table 2**). In most cities, station densities are higher in downtown and inner-city areas as there is typically more demand in these areas.

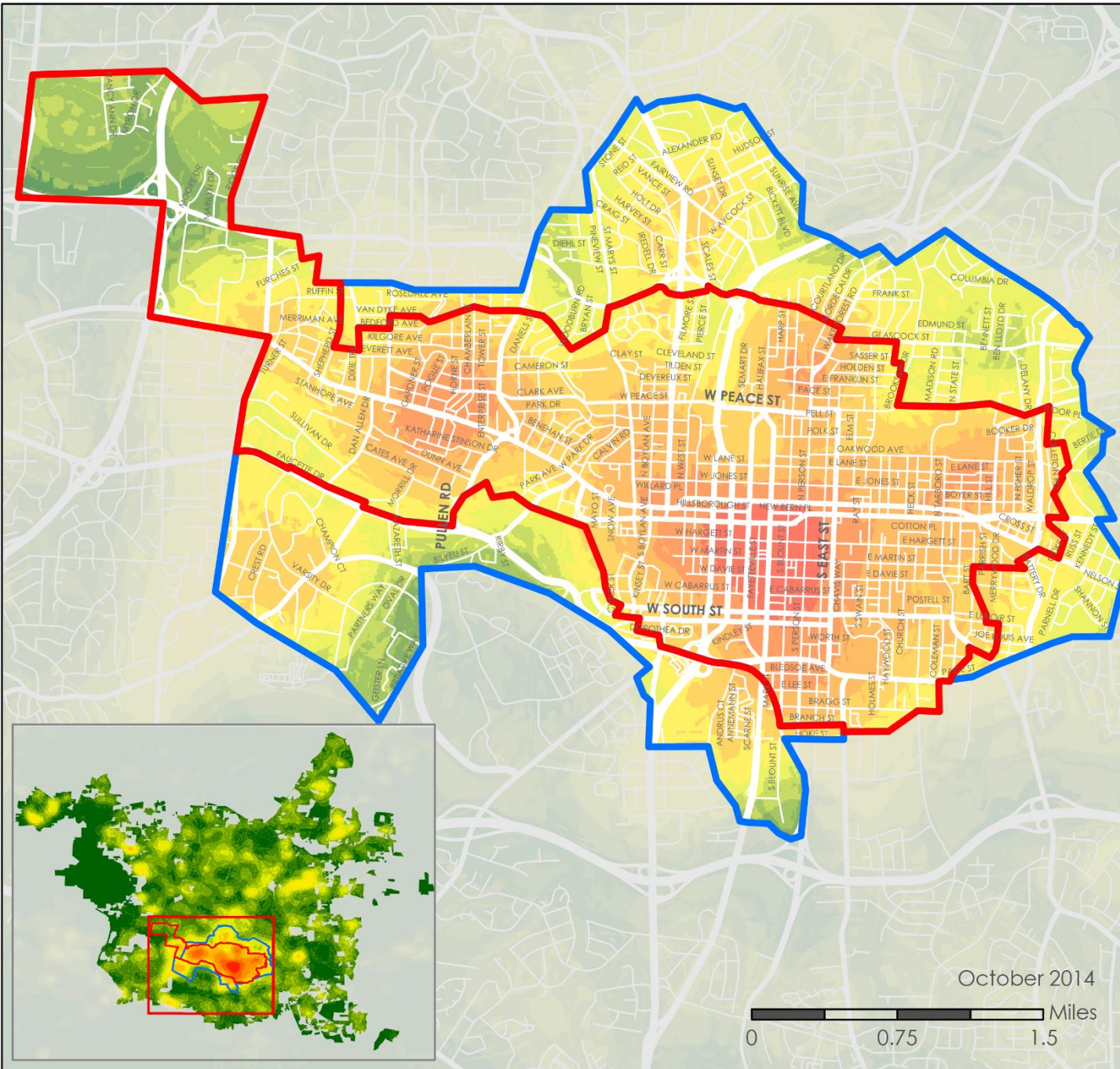
Table 2 – Peer Cities Comparative Numbers

Program	Density	Area (Sq. Mi.)	Stations
<b>Chattanooga</b>	6.3	5.2	33
<b>Charlotte</b>	1.8	11.2	20
<b>Washington DC</b>	10.7	22.8	244
<b>San Antonio</b>	10.3	5.2	53
<b>Spartanburg</b>	5	0.8	4
<i>Average All Peer Systems</i>	6.8	9.0	70.8

In Raleigh, stations should be placed at relatively high densities (i.e., no more than ½ mile apart) so that users can have an expectation that a station will be available within a reasonable walking distance from anywhere in the system area. This will also provide some redundancy so that if a station is empty or full, a user can go to a nearby station and find an available bicycle or an empty dock. However, in high activity areas, stations may be spaced at higher densities (e.g., ¼ mile apart or a five minute walk) to provide more redundancy to the system. In outer areas, where there may not be other stations nearby, additional capacity (i.e., more docking points) should be considered to avoid users being faced with empty or full stations.

<sup>1</sup> Based on place of residence.

<sup>2</sup> Based on place of employment.



- Proposed Phase 1
- Proposed Phase 2

# Raleigh Bike Share

## Proposed Phasing

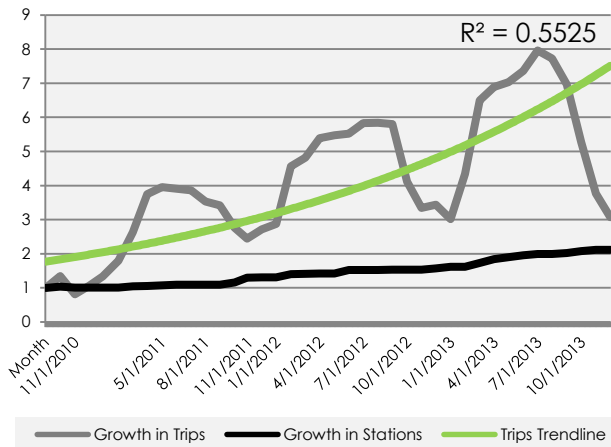


October 2014

0 0.75 1.5 Miles

Figure 2 - Proposed Phasing

While there are no definitive guidelines for the optimal size of a bike share system, recent research on bike share growth has indicated that ridership increases at a rate much higher than the growth in the number of stations. **Figure 3** shows the growth in ridership of Washington D.C.'s Capital Bikeshare compared to the increase in the number of stations since the system launched.<sup>3</sup> In creating a critical mass for the system, too few stations will serve only a limited number of destinations and be less useful to potential riders.



**Figure 3 - Growth in Capital Bikeshare Ridership Compared to the Increase in System Size**

Based on typical station densities and the above guidelines, the recommended system sizes are shown in **Table 3**.

**Table 3 - Proposed Phasing**

	Phase 1	Phase 2	Total
<b>Density (stations per sq. mi.)</b>	4.5	2.0	3.3 <sup>4</sup>
<b>Area</b>	6.9	9.8	16.5
<b>Stations</b>	30	20	50
<b>Bicycles</b>	300	200	500
<b>Docks</b>	510	340	850

### Phase One (30 stations / 300 bicycles)

Phase 1 includes 30 stations located in the Downtown and extending west to North Carolina State University. This phase includes some bike share stations in predominantly low income and/or minority neighborhoods to help serve as an affordable transportation option for these residents. Under this proposed phasing, Downtown Raleigh would include 12 stations at a density of 8.4 stations per square mile.

Phase 1 serves just under nine square miles and would cover around five percent of the City's total land area, serve eight percent of the city's

residents, and serve 42.3 percent of jobs. The mix of uses, increased number of activity centers, and higher densities in this area give it the highest potential for bike share demand. This area is expected to maximize revenue potential, which may be needed to support future phases of the system.

### Phase Two (20 stations / 200 bicycles)

Phase 2 includes 20 stations extending north and south of Downtown Raleigh and south west to the NCSU Centennial Campus and surrounding areas. This phase will also include some infill of the Phase 1 area. When complete, this phase will serve an additional area of approximately 9.8 square miles at a density of 2.0 stations per square mile. A lower density of stations in this area is reflective of the generally lower density of land use.

This phase will serve an additional seven percent of the total city area, three percent of jobs and five percent of residents.

Both phases will serve North Carolina State University. The university plays a large role in the community with over 34,000 students and 8,000 faculty and staff.<sup>5</sup> Universities are excellent start-up locations for bike share programs as college students tend to be early adopters. Increased bike share service at NC State could offer links from campus to student housing and to various off-campus locations including providing increased access to transit and Downtown Raleigh.

The proposed phasing considers existing bicycling facilities, major regional destinations, and a number of activity centers with high concentrations of commercial, employment, institutional and residential land uses. As the City continues to expand its network of bicycle friendly facilities, it is expected that the proposed bike share system will provide a complementary service introducing residents to bicycling as an affordable and healthy transportation option.

## PRELIMINARY STATION LOCATIONS

Stations should generally be placed in safe, convenient, and visible locations. Station locations may include the public right-of-way in the street, on sidewalks, or in parks and other public lands. They can also be located on private property through the use of a License Agreement or easement acquisition with the property owner. In all instances stations

<sup>3</sup> Buck, Darren. Bicycle Program Specialist District Department of Transportation.  
<sup>4</sup> Average station density.

<sup>5</sup> North Carolina State University About Us. Obtained from <http://www.ncsu.edu/about/> on October 15, 2014.

should be available at all times to the public and to the operator for the purposes of maintenance and bicycle redistribution.

General station locations were identified for the two phases of the bike share system. Locations were determined based on public and stakeholder input, as well as a heat map analysis performed as part of the Feasibility Study and refined based on a desktop review of available aerial and street-level photographs. The list of possible station locations was vetted by staff from the City of Raleigh and representatives from North Carolina State University.

Preliminary station locations are shown on **Figure 4**. Identification of a bike share station on these maps does not commit a bike share station to that specific location. These are suggested locations arranged to achieve the suggested station density and are a starting point for future refinement of the plan.

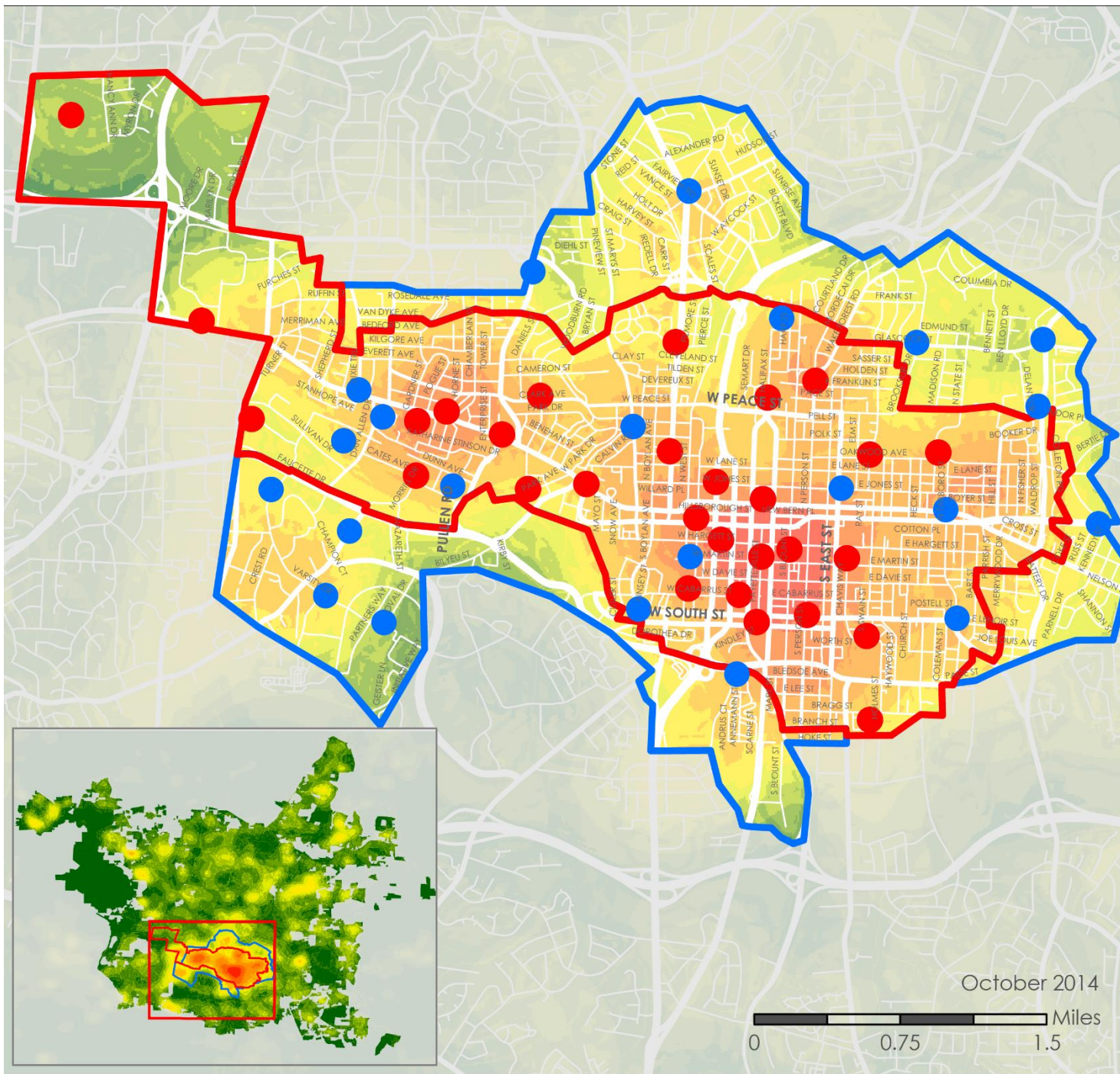
Final station placements will require additional public outreach and field work to confirm the availability of space, identify right of way and property ownership, meet the specific needs of the equipment vendor (such as solar exposure requirements), react to potential sponsorship agreements, and identify the interest of the adjacent property and business owners.



Credit: Boulder B-Cycle



Credit: Deco Bike



- Proposed Phase 1
- Proposed Phase 2
- Phase 1 Stations
- Phase 2 Stations

# Raleigh Bike Share

## Proposed Phasing



October 2014

0 0.75 1.5 Miles

Figure 4 - Preliminary Map of Station Locations

# STATION GUIDELINES

The following section provides guidance for the placement of each station type. An example set of station layouts were developed based on “typical” on-street and off-street situations using standards from other cities and the guidelines developed in consultation with City Engineering staff.<sup>6</sup> The full set of station layouts is included in **Appendix 1**.

## GENERAL SITING REQUIREMENTS

The footprint for a 17 dock station is approximately 6-foot wide by 47-foot long. It is recommended that additional width be provided behind the back of the bicycle to allow it to be pulled out of the dock without encroaching into the traffic lane or pedestrian travel way behind it. On lower volume streets, one-to-two feet may be sufficient, however, on busier streets it is recommended that at least four-feet be provided to allow for two feet of clearance behind the bicycles, unless there is a buffer such as a bike lane or painted separation adjacent the station. Additional width should be provided where the bikes back up to a constrained condition such as a wall, heavy traffic street, etc. Additional length will be required for larger stations.

Other considerations include:

- Sites must have unrestricted public access at all times.
- Sites should ensure maximum visibility.
- Sites must not impede the use of any existing facilities, such as bus stops or fire hydrants.
- Sites need to meet the necessary solar (or non-solar) and cellular signal requirements specified by the equipment vendor.
- Sites must be placed on a hard, level surface.
- Sites should consider access for installation and for regular maintenance and rebalancing.
- Where possible, sites should make use of existing lighting or install new lighting if necessary
- Except in specific circumstances, stations should be located as close as possible to the corner / crosswalk to maximize visibility.

### Sidewalk Sites

Sidewalk sites should not interfere with existing pedestrian travel patterns and must maintain sufficient clearance to fixed objects and utilities.



Credit: Capital Bikeshare

**Figure 5 - Example of Sidewalk Station**

In busy pedestrian areas (such as the CBD), the following guidelines should be considered:

- Curbside installations: a minimum sidewalk width of 14 feet, which allows for a two feet clear zone between the back of curb and the front of station, six feet for the width of the station and bikes, and six feet for the pedestrian thoroughfare.
- Non-curbside station installations: a minimum sidewalk width of 12 feet if unconstrained; or 13 feet if the station abuts a building or other physical constraint (to provide a one foot space for maintenance and debris cleaning).

On less traveled sidewalks, and depending on the level of pedestrian activity, a minimum width of 5-foot should be maintained for pedestrian travel. Stations could be placed on the grass verge adjacent a sidewalk if a concrete pad is constructed (See Example in **Appendix 1**).

Sites should not interfere with existing pedestrian travel patterns and where possible should be placed in line with other street furniture. Furthermore Sites may not be placed:

- Within five feet of a crosswalk.
- Within 10 feet of driveways.
- Within 15 feet of fire hydrants.
- Within five feet of stand pipes.
- Within two feet of fixed objects such as lamp posts.
- Within 15 feet of a bus stop and ensuring sufficient distance from rear bus egress doors

<sup>6</sup> New York City DOT (2012). NYC Bike Share – Designed by New Yorkers. Report on Bike Share Outreach.

(if the station is placed on the curbside. Stations can be closer if placed on the non-curbside) (See Example in **Appendix 1**).

- Directly in front of the main entrances to major buildings.

- In no stopping zones.
- Within 15 feet of the end of a bus stop.
- Within 15 feet of a fire hydrant.
- Within 10 feet of signed loading zones, driveways or curb cuts.
- Within five feet of a crosswalk.

Sites should be set back a minimum of two feet from the curb when adjacent to on-street parking to allow for the opening of automobile doors. A minimum of 18 inches is acceptable where parking is not allowed.

### On-Street Sites



**Figure 6 - Example of On-Street bike share station**

On-street sites typically make use of converted parking spaces; however restricted parking areas may also be considered where these sites do not impact sight lines. Wherever possible, it is preferred that on-street sites first consider non-metered parking spaces and that any metered parking conversion be reviewed by the City staff.

Generally, on-street stations should first consider low traffic volume streets. However, higher traffic volume streets can be considered where there is sufficient width for a user to pull a bicycle from the station without encroaching into the traffic lane, or where there is a buffer provided between the station and moving traffic, e.g., a bike lane or painted buffer.

On-street sites should be arranged with the docks at the curbside and bicycles pulling into the street. Stations may not be placed:

Stations may be placed in existing no parking and no standing zones as long as the station does not impact sight lines. Stations are discouraged on the inside of turns unless the geometry is such that the location is deemed appropriate by the City's engineering staff.

A minimum of six inches should be left between the back of the station and the curb to allow for drainage flow. Sites must be reviewed to ensure they meet appropriate safety criteria. Standard safety treatments should be developed in consultation with the City's engineering staff and may include street markings, bollards or other safety devices.

### Parks, Plazas and Other City Property



**Figure 7 - Bike share station in small plaza**

Sites may be placed in parks or other City properties at the discretion of the relevant agency. In general, sidewalk siting guidelines apply to these sites.

### Private Property

Sites may be placed on private property at the discretion of the owner. Sites on private property must have unrestricted public access at all times. The operator must secure a License Agreement or easement acquisition to establish the terms of use, to transfer liability, and to ensure the site is accessible to the public at all times. Generally, sidewalk siting guidelines apply to these sites. An example of a bike share station located on private property is included in **Figure 8**.





Credit: Deco Bike

Figure 8 – Deco Bike station in private property



Credit: Capital Bikeshare

Figure 9 – Concrete Pad improvement for bike share station on unpaved area

### Off-Street on unpaved areas

Sites may be placed on off-street areas depending on space availability. Most vendors recommend against placing station on unpaved surfaces. For these sites, it is recommended that some site improvements such as construction of a concrete pad be made. In general, sidewalk siting guidelines apply to these sites (see **Figure 9** for more details).

# PERMITTING

There are a number of policies that must, should, or could be considered for the design review approval of bike share stations. These requirements have been categorized into three groups:

- Group 1 will be required regardless of location.
- Group 2 may apply depending upon site-specific and design-specific requirements.
- Group 3 includes requirements based on specified locations relative to the roadway right-of-way.

**Table 4** below provides a summarized account of the type of permitting and approval process needed for each of the five basic location types mentioned in the previous section. **Figure 10** presents a flow chart of the five basic location types explained in the previous section, and the design requirements that would apply to each.

## Group 1 Requirements

At a minimum, potential bike share station design must comply with the Raleigh Street Design Manual and the Outdoor Sign Ordinance. These documents are general and descriptive (e.g., they use the term 'should'), as opposed to specific and prescriptive (e.g., guidelines that use the term 'shall').

## Group 2 Requirements

If the proposed location is within one of the City's six designated historic districts, a Certificate of Appropriateness (COA) is required. If the station requires direct connection to the power grid rather than solar power, an electrical permit will be required.

## Group 3 Requirements

Bike share stations located outside the roadway right-of-way will require a zoning permit from the City's Development Services office. If the property is not owned by the City, an easement acquisition is needed in addition to the zoning permit. The easement acquisition is necessary to ensure that the bike share station is visible and easily accessible to the general public from the street or City property.

In addition, if the station location is along a state-maintained roadway, an encroachment agreement is required.

## PERMITTING PROCESS

The City of Raleigh Development Services will be the agency responsible for coordinating the appropriate permits for the installation of bike share stations. The

departmental manager collaborated with the project team and participated at meetings that discussed the plan review process. It was determined that establishing a **programmatic review** sequence, whereby the City may review one set of typical designs and apply those standards to multiple potential station locations, is the desired approach.

## Consolidated Review Process

The programmatic review sequence, also known as an 'umbrella permit', should streamline the permitting process and include the following approvals (at minimum):

- Certificate of Appropriateness (COA) (Raleigh Historic Development Commission)
- Encroachment Agreement (Public Works)
- Easement Dedication (Development Services)
- Zoning Permit (Development Services)

This consolidated review will allow the City to streamline the process by avoiding multiple review periods, and by permitting multiple station locations at once. It is important to note that a similar process was followed for the installation of 23 electric vehicle charging stations by the Office of Sustainability between 2010 and 2011.

If a proposed bike share station is located within the right-of-way along or immediately adjacent to a state-maintained roadway, then an encroachment agreement will be required from the North Carolina Department of Transportation (NCDOT) Highway Division (Division 5). For Phase 1 implementation, avoiding state-maintained roadways is recommended if possible to avoid potential complications and delays.

A single encroachment agreement will satisfy multiple station locations provided that the owner is the same. There is no charge for the encroachment agreement, and the typical approval time is 30 to 60 days depending upon the availability of NCDOT staff.

## Individual Reviews

Electrical permits cannot be consolidated because each potential bike share station will require a separate electrical connection meter, and is therefore considered a permanent structure. According to the current City code, each structure must include a unique physical address to assign to the Emergency Communications Center (911 system). Power supply to stations may not be shared

from an adjacent property, even if that adjacent property is sponsoring the bike share station and its electricity.

Solar-powered stations, however, are considered temporary structures and therefore would not require a physical address or an individual electrical permit.

## GENERAL SUBMITTAL REQUIREMENTS

The following documents will need to be submitted:

1. Certificate of Appropriateness – Major Work due to large number of locations
  - Review and approval by the full Committee
  - 13 copies of the COA Application Form
  - \$144 application fee
2. NCDOT Encroachment Agreement
  - 6 copies of agreement with plan documents
  - No fee; Typically 30-60 days to process
3. Zoning Permit
  - \$81 minimum fee for all other types of construction

## DESIGN GUIDELINES & RESTRICTIONS

The following City of Raleigh documents are important resources for station location guidance:

### Street Design Manual

<http://www.raleighnc.gov/content/extra/Books/PlanDev/StreetDesignManual/#80>

- Obstruction-free sight triangle based on the various posted speed limit and number of lanes (Table 6.12B).
- Comply with bicycle parking design, placement, and spacing (section 6.24.1).

### Outdoor Sign Ordinance

<http://www.raleighnc.gov/business/content/PlanDev/Articles/DevServ/Signs.html>

- Maximum of six square feet in area.
- Not located within the sight triangle area formed 50' from an intersection.
- Not located within ten feet of any conductor or public utility guy wire.
- No duplicate signs located within 1,000 feet.
- Maximum 10 percent of total sign area may include company sponsorship logo (see Red

Hat Amphitheater sign, located at 500 S McDowell St as a recent example).

### Raleigh Historic Development Commission

<http://rhdc.org/certificates-appropriateness/design-guidelines>

### Raleigh Development Fee Schedule (2014-15)

<http://www.raleighnc.gov/content/extra/Books/PlanDev/DevelopmentFeeSchedule/#5>

## OFFICE CONTACT INFORMATION

Raleigh Historic Development Commission  
c/o Development Services  
One Exchange Plaza, Suite 304  
Raleigh, NC 27601  
919-996-2634

Raleigh Development Services Office  
One Exchange Plaza, Suite 304  
Raleigh, NC 27601  
919-996-2634  
Office Manager: Christine Darges

NCDOT Highway Division 5  
2612 N. Duke St  
Durham, NC 27704  
919-220-4600  
District Engineer  
One Bank of America Plaza, Suite 2  
Raleigh, NC 27601

Table 4 –Permitting Review Authority

Departmental Coordination/Requirements	Potential Station Location Types				
	Within ROW		Beyond ROW		
	City-Maintained Roadway	State-Maintained Roadway	City-owned Property	State-owned Property	Private-owned Property
<b>Raleigh Historic Development Commission (RHDC)</b>	COA	COA	COA	COA	COA
<b>Raleigh Development Services Approval</b>	Street Design Manual	-	Street Design Manual	Street Design Manual	Street Design Manual
	Outdoor Sign Ordinance	Outdoor Sign Ordinance	Outdoor Sign Ordinance	Outdoor Sign Ordinance	Outdoor Sign Ordinance
	Electrical Permit	Electrical Permit	Electrical Permit	Electrical Permit	Electrical Permit
	-	-	Zoning Permit	Zoning Permit	Zoning Permit
	Right of Way Permit	-	-	-	-
	-	-	-	Easement Dedication	Easement Dedication
<b>Raleigh Public Works Department</b>	Encroachment Agreement	-	-	-	-
<b>NCDOT Division 5 Office</b>	-	Encroachment Agreement	-	-	-
<b>NC Department of Insurance (DOI)</b>	-	Building Code Approval	-	Building Code Approval	-



Credit: Hubway

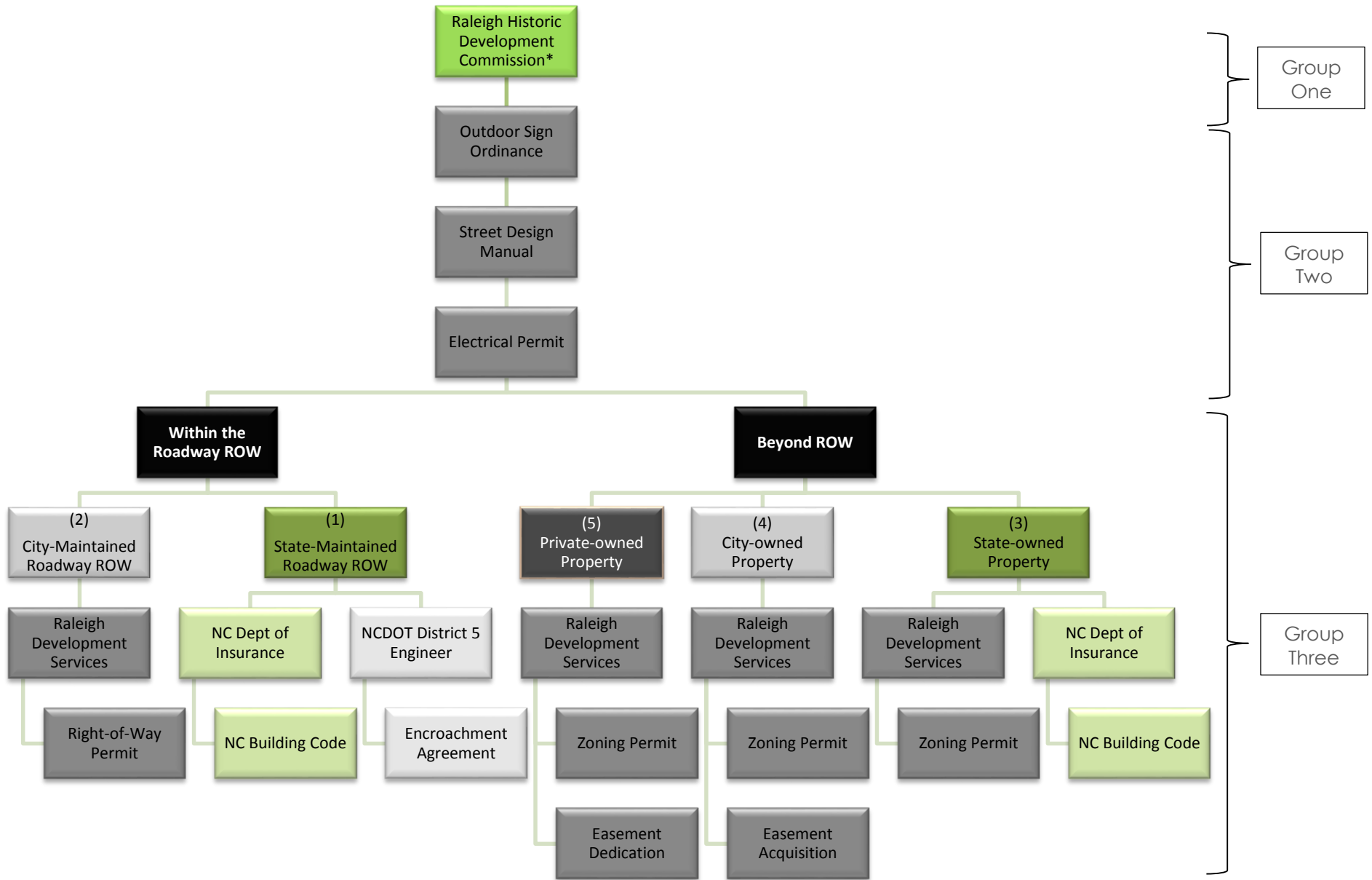


Figure 10 – Permitting Review Flow Chart

# BUSINESS MODEL EVALUATION

A key outcome of this Study is to select a governance structure for the program. In general, the following functions are required to mobilize and operate a bike share system:

- Obtain political, public, and other support.
- Raise funds for initial capital and early operating costs.
- Procure the equipment vendor and the operator.
- Administer contracts with the equipment vendor and the operator.
- Own and maintain the system and its assets.
- Evaluate and expand the system.

These functions can be undertaken by one or more organizations. Existing U.S. bike share programs operate under different business models depending on the jurisdiction's funding environment, institutional capacity, and local transportation needs.

The relationship between system owners and system operators in U.S. bike share systems is shown on **Figure 11**. The most common models are systems owned by cities and operated by a private contractor, non-profit owned and operated, or privately owned and operated.

Each model is reviewed in more detail in the section below and an evaluation of the role of public agencies, non-profit organizations, and the private sector in owning and managing a potential bike share program in Raleigh are evaluated in

Table 5. The evaluation considers a number of criteria including key operating parameters and local priorities identified in the Feasibility Study. The evaluation criteria included:

- Who will own the system?
- Who will be responsible for raising capital funds?
- Who will operate the system and be responsible for covering operating costs?
- What potential funding sources are available under this business model?
- What is the organizational capacity and interest for this model?
- Does the model allow for regional expansion?

- How does the model meet the goals and objectives for the system, including:
  1. **Bicycling:** Increase the amount of bicycling in Raleigh.
  2. **Mobility:** Offer additional transportation options for residents of, students and employees in, and visitors to Raleigh.
  3. **Equity:** Increase equitable and affordable access to public transportation.
  4. **Economic:** Increase the attractiveness of Raleigh as a place to live, work, visit and do business.
  5. **Financial:** Create a system that is financially self-sustaining over the long term, with owner and operator incentives to meet this goal.

These models and the results of the evaluation are described in the sections below.

There are advantages and disadvantages to all of the business model types. However, the evaluation shows that there are a number of significant advantages to a city-owned model, as well as some key limitations to the other models. Therefore, the recommendation is for a city-owned, privately operated governance structure for a bike share program in Raleigh. Below is a description of each model, as well as a chart with a detailed evaluation of each model in Raleigh's context.

A privately owned and operated system requires no direct public investment into the system. A private vendor is usually given the space on the street by the municipality at no cost and either uses private investment or sponsorship funds to purchase and install bike share stations. The company then earns revenue through membership and usage fees coupled with advertising and sponsorship. The only two systems operating under this model in the United States are DecoBike in Miami Beach (large tourist market) and Citi Bike in New York City (large tourist market, financial capital, global exposure – although it is well-documented that the NYC system is not performing well financially). At the time of writing of this document, many systems have been promised to cities using such a business model – Phoenix, Atlanta, Tampa, Orlando, Jersey City and Providence – however, none have actually launched due to lack of funds raised by the private companies. It is unlikely that a bike share program in Raleigh would be able to attract this level of private sector interest.

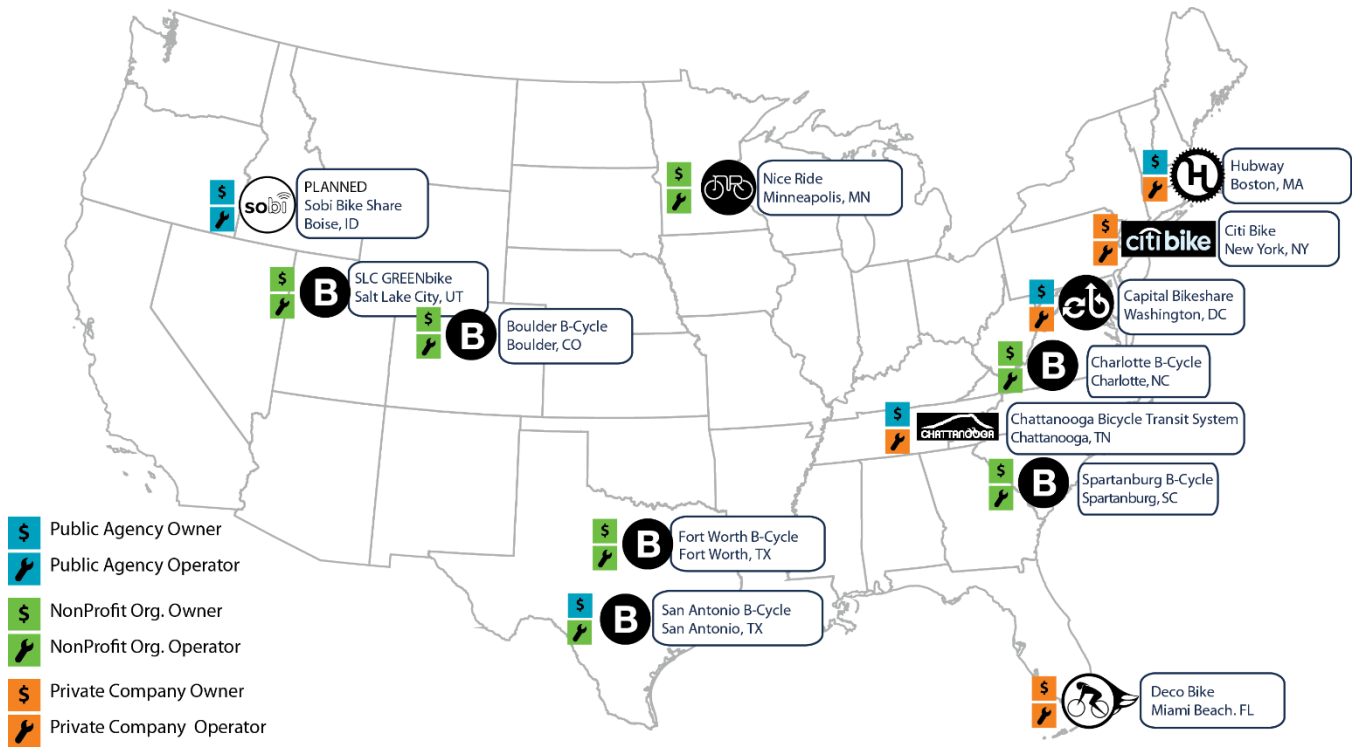


Figure 11 - Relationship between System Owners and System Operators in U.S. Bike Share Systems

This model also minimizes agency control (e.g., agency involvement in decisions on how and where the system will expand), limits funding options to whatever the private sector is able to bring to the table and makes it more difficult for a program to meet non-financial goals.

A regional agency-owned and privately operated system is a potential governance structure for Raleigh, considering the regional nature of the area. Potential agencies are the MPO, Triangle Transit and others. Many regional agencies have been involved in bike share – Hubway’s original RFP was issued by the Metropolitan Area Planning Commission; Bay Area Bike Share is currently owned and managed by the Bay Area Air Quality Management District, and the MPO is going to be taking over ownership; Washington DC area’s Council of Governments enabled the multiple contracts under Capital Bikeshare to be consolidated into one system. Clearly such ownership most easily sets up a system for regional expansion. However, the regionalism could come at the expense of fulfilling Raleigh’s individual goals for its system. Currently, there are no other municipalities in the Triangle region that are actively pursuing bike share, so this model is not recommended.

The non-profit governance structure has been implemented in dozens of communities around the U.S., and has a number of advantages, but also

some complications. Either a new non-profit can be formed (sometimes housed within a larger organization) or an existing non-profit can take on responsibility for the bike share system. Funding for equipment typically comes to the non-profit in the form of public, private and philanthropic sources. The ongoing financial responsibility for operations and additional equipment falls to the non-profit. The non-profit would have the option of operating the system directly or contracting this, and any other functions to a third party. This structure has a wide variety of funding options and can meet both local and regional goals for a system. However, it can be cumbersome and slow to implement and build capacity for this non-profit to take public funding, procure a multi-million dollar system, and either operate a system or administer an operating contract.

A city-owned and privately-operated system is another prevalent governance structure and is the model for Capital Bikeshare in Washington D.C. and Hubway in Boston, amongst others. In this structure, the city is responsible for raising capital and operating funds, and owns the system infrastructure including the stations and bikes. It can decide which other functions it takes on and which it contracts to a third party (e.g., marketing and promotions, and operations). This model provides fundraising diversity and maintains the most control of the system for a city to meet all goals – financial and other.

Table 5 evaluates the different potential ownership models in relation to the stated goals and objectives for a bike share system in Raleigh. The evaluation shows that the preferred structure is a City-owned system that is privately operated.

A City-owned system would:

- Maximize the City of Raleigh's control over all aspects of the system – from creating a financially sustainable system to meeting the specific goals outlined in the Feasibility Study;
- Allow for the most time-efficient mobilization of a system for Raleigh;
- Leverage the organizational interest and capacity that currently exists in the City;
- Leverage the significant funding potential for the City;
- Bring in private operations to maximize system quality and maintenance;
- Lower the implementation risk, as many cities around the country have successfully implemented this structure; and
- Leverage the public relations capabilities and local partnerships held by the City to maximize the economic benefit of bike share to the City.

### Recommended Model: City Owned and Privately Operated

Based on the above analysis, this report recommends a City-Owned and privately operated system for Raleigh. This structure is well-tested, as many municipalities around the country have successfully implemented it. This also mirrors the current structure of the Capital Area Transit. Following are some factors for consideration in implementation:

- **Administration:** It is recommended that one full-time City employee manage the operating contract for the system. During procurement and launch, this employee will require assistance on many fronts – grant-writing, contract negotiations, public relations and site planning. Once the system is in steady state (no local or regional expansion), this position could be a part time position.
- **Outsourced functions:** The City can choose which functions of bike share system management and operations it would like to retain and which to outsource. It has been

recommended that basic operations (system installation, bike and station maintenance, customer service) be undertaken by a private operator because the City is not currently set up to undertake direct operations, and existing operating experience can maintain high quality operations. However, one function that has been successfully split off is system marketing. This includes naming, branding, website design, pricing, membership sales, events and promotions. The City can choose to market the system itself, or directly contract with another company, department, or agency whose expertise is in outreach and promotion for transportation programs – such as the CommuteSmart program, other Transportation Demand Management programs, or Capital Area Transit. Capital Bikeshare undertakes its own marketing through a company contracted through the TDM program, while operations is separately undertaken by a private company.

- **NCSU partnership:** NCSU played a major role in this study, and the system will strongly serve its students, faculty and staff. Its exact relationship to the system will likely be determined during implementation, but it is clearly a major stakeholder in the system. In other systems with large university stakeholders, the university acts as a funding sponsor for stations serving their students. In exchange, they receive branding space on the stations, potentially on some bicycles, and can determine where their sponsored stations are located. If they are located on university property, they execute a license agreement with the operator for access, liability indemnification and insurance issues. Examples of such relationships are Harvard University and the Cities of Boston and Cambridge in Boston area's Hubway (Harvard has property in both Boston and Cambridge); University of Minnesota and Nice Ride.
- **Sponsorship and advertising:** In a City-owned system, the City will be responsible for all fundraising, including public funding through federal or state grants, City funding, advertising and private sponsorships - both large title or presenting sponsors and smaller station or bike sponsors. Some cities, such as Boston and Salt Lake City, have undertaken the sponsorship acquisition directly.



Table 5 - Evaluation of Potential Ownership Models in Raleigh

Model	Fundraising Responsibility	Potential Funding Sources	Organizational Interest / Capacity	Potential for Regional Expansion	Goal #1: Bicycling	Goal #2: Mobility	Goal #3: Equity	Goal #4: Economic	Goal #5: Financial	Other	Examples
<b>Existing or New Non-Profit</b>	Non-profit	● Widest variety of capital and operating funding sources including city, state, federal, private, foundations, as well as diverse, community-based funding	● Unknown interest or capacity in existing non-profits, or could be created with a new non-profit.	● As an independent body, the non-profit can establish a regional contracting structure.	● Important to success and a major goal of the non-profit. Wider decisions on bicycling out of the control of the non-profit.	● Important to the success of the system and a major goal of the non-profit. Wider transit decisions out of the control of the non-profit.	● Pricing structure can be controlled. Social equity is consistent with the community responsibilities of a non-profit.	● Opportunity for broad community partnerships.	● Non-profit operators tend to operate at lower cost. Can build capacity dedicated to on-going fundraising.	● Broad community support for non-profits in general. Slow in implementation.	Aspen WE-Cycle, Boulder B-Cycle, Denver Bike Sharing, Madison B-Cycle, Nice Ride Minnesota (Minneapolis).
<b>Regional Agency</b>	Agency (MPO, Triangle Transit or other)	● Wide range of capital funding sources. Public funding sources could be considered for operations.	● Some agencies not well-suited for managing an operations contract. Capacity depends on specific agency.	● Regional agencies well-suited for multi-jurisdictional expansion.	● Regional agencies can have influence on bicycling policy, but not necessarily bicycling infrastructure in Raleigh itself.	● Improved transportation options may be central to agency's mission, but depends on agency. May not be focused on Raleigh itself.	● Fee structure can be controlled. Social equity is consistent with agency goals and responsibilities.	● Agency has significant relationships across region to promote bike share and partnerships.	● Private operator more expensive than in-house. Opportunity to bring some functions in-house (marketing).	● Strong transparency of financing and decision making. Private operators bring experience from other cities. Could be slow in implementation.	Bay Area Bike Share
<b>City</b>	City	● Wide range of capital funding sources. Public funding sources could be considered for operations.	● City has capacity and interest for managing bike share contract	● Although City not set up for regional expansion, many regions have created regional systems starting from a City.	● City in full control of bicycling policy and infrastructure implementation	● City holds relationship with transit agency and NCSU to maximize mobility impact	● City can sculpt system specifically suited to meet Equity goal.	● City can utilize media and political influence to promote system and create partnerships.	● Private operator more expensive than in-house. All city-managed systems in US have to date been sustainable financially. Opportunity to bring some functions in-house (marketing).	● Strong transparency of financing and decision making. Private operators bring experience from other cities. Fast implementation. Many successful examples.	Chattanooga Bike Transit System, Capital Bikeshare (Washington D.C.); Hubway (Boston)
<b>Private</b>	Private Contractor	● Has the least variety of funding sources available.	● Interest will depend on financial performance evaluation and fundraising capacity. Staff capacity can be created.	● As an independent body, the private contractor can negotiate new contracts with regional partners to enter the system, however, standards will need to be coordinated.	● Important to success of the system, but not a primary mission. Wider decisions on bicycling out of the control of the contractor.	● Important to the success of the system, but not a primary mission. Wider transit decisions out of the control of the contractor.	● Price structure may need to reflect financial performance. Expansion likely to be demand-driven.	● Strength in branding and marketing in particular in the contractor's interest to attract visitors to the system.	● No successful sustainable private operator examples in smaller cities.	● Unlikely market for a completely privately owned and operated system. Many private systems around the US promised, few delivered.	Implemented: DecoBike (Miami); Citi Bike (NYC) Promised: Phoenix, Tampa, Orlando, Providence, Jersey City

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

Others, such as Philadelphia and Chicago, have hired sponsorship companies to acquire sponsors. In both cases, it is strongly recommended that the City play a strong role, as most sponsors decide to invest based on both the media exposure and the community partnership with the City. If it is determined that advertising on stations is allowed and desired, the City can hire an outdoor advertising company to sell such advertising to add revenue to the system. Further detail on sponsorship and advertising is included later in the report.

- **Regional expansion:** The most difficult aspect of the City-owned structure is that it is not naturally set up for regional expansion. However, should other regional partners desire to join the system, a few options exist for the future:

- A regional agency (MPO or other) can help enable add-on contracts without additional procurement processes, similar to MAPC's role in the Boston region and the COG's role in Washington DC. Whether this is possible and under what structure would need to be determined by the MPO.
- Other jurisdictions could simply undertake a new procurement process for a system requiring that their system can be used interchangeably with Raleigh's.
- Procurement processes in Oregon and Arizona have allowed for other cities in the state to add on without a new process. It is possible that such a process could exist in North Carolina.
- Ownership of Raleigh's system could be transferred to a new non-profit or a regional agency to enable regionalization in later years.

In any case, there are many items that must be considered during a regionalization process, including:

- Amount of integration required among the different systems - is it enough that one key and one membership can be used, or must the bicycles be able to dock in the other jurisdictions?

- Branding – should each jurisdiction have the same name and brand, or can they be different?
- Pricing – must each jurisdiction have the same pricing structure?
- Single operator or multiple – must each jurisdiction have the same on-the-ground operator?
- Revenue and expense sharing – if there are costs shared among jurisdictions, how are these split? How are membership and usage fee revenues split among jurisdictions?
- Decision-making – how is each jurisdiction represented to make both initial and ongoing decisions for the system?
- Sponsorship and other funding – is there any sponsorship or other funding that is shared among jurisdictions, or is each responsible for its own capital funding and any operating shortfall?

Overall, the City-owned and privately-operated structure allows the City of Raleigh to maximize control on all aspects of its system, and leverage the significant interest in the City of implementing a system within the next two years. It is a well-tested model that ensures a system will be implemented in a financially sustainable manner that has significant local support and buy-in.



# FINANCIAL ANALYSIS

This section explores the financial needs and performance of a potential bike share program in Raleigh and recommends a funding plan for pursuing required funds. A financial pro-forma was prepared to understand the capital, installation, and operating costs of the proposed bike share system and to forecast potential revenues. The pro-forma evaluates a five-year initial operating period, which is a typical contract length for bike share in the United States. It also considers the sensitivity of a number of the assumptions used in the financial pro-forma, such as the impact of lower or higher than expected ridership.

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

## FINANCIAL PRO-FORMA

The financial pro-forma includes a five year evaluation of expected program costs and revenues starting from when the City signs a contract with a private operator. The pro-forma includes numerous inputs. Where these variables were unknown, information was gathered from membership, ridership and financial data for the comparable cities for this study.

## System Size and Phasing Assumptions

The system sizes and phasing recommended in the previous sections were used to develop the financial pro-forma. Some assumptions were made regarding the timing of each phase as shown in **Table 6**. It is assumed that Phase 1 launches in the second quarter (spring) of the first year, and that Phase 2 launches in the second quarter of the third year.

## Business Model Assumptions

The financial model assumes that the system is owned by the City and operated by a private entity. The City may decide to separately contract some services (such as site planning or marketing), but this would not change the overall operating costs.

**Table 6 - Recommended System Size and Phasing**

	Phase 1	Phase 2	Total
<b>Installation Date</b>	Q2 Year 1	Q2 Year 3	
<b>Number of Stations</b>	30	20	50
<b>Number of Bikes</b>	300	200	500
<b>Number of Docks</b>	510	340	850

## Capital and Installation Costs

Based on an average of recent prices for the major bike share equipment vendors in the United States, a 10 bike / 17 dock station represents a total cost of \$41,000 per station that includes the base equipment plus shipping and other fees, spare parts, system keys, stickers and a system map.

The pro-forma includes \$1,000 per station for installation, which includes travel for the equipment vendor, and any extra labor and equipment not provided by the equipment vendor. If site planning and permitting is contracted to a third party, this cost is approximated at an additional \$2,000 per station (this is included in the pro-forma). These costs are based on rates quoted in other cities.

## Pre-Launch Costs

The financial model includes a series of system startup costs during the pre-launch period. An overall general system start-up cost of \$267,000 is included in the pro-forma and includes:

- Six months' salary for senior management and administration.
- Administrative costs such as insurance, legal, and accounting.
- Direct operational costs such as real estate acquisition for this period, vehicle costs, purchase of uniforms and equipment and employee training.

These costs do not include costs for City administration, procurement, contract management, sponsorship acquisition or public outreach.

## Operational Costs

The pro-forma includes operational costs after the "go-live" date that represent everything needed to keep the system operational, including rebalancing, bike maintenance, station maintenance, customer service, software support, reporting, insurance and all other day-to-day operations. It should also be

noted that the cost of system marketing is included in the pro-forma. The operational cost is presented on a per-dock-per-month basis. This approach is taken for several reasons:

- Docking points are the most accurate representation of a system size, and represent stable infrastructure, as opposed to a bike fleet, which varies on a daily basis due to repairs, rebalancing and seasonality.
- Data is available for this metric from several system contracts around the country.
- It is easily scalable as a system expands.

The pro-forma assumes a per-dock-per-month general operating cost of \$107 in the first year. Systems operate anywhere between \$55 and \$120 per dock per month, with the low end of the range being non-profit operators and the high end being large city, privately operated systems.

The operating cost will ultimately be determined by (1) the wages and salaries offered by the company; (2) the level of service offered and intensity of system rebalancing required; and (3) operational efficiencies that can result in cost reductions (e.g., use of City-owned property for operating space).

A certain amount of spare parts replacement will be covered by warranty and/or equipment insurance and therefore is not included in the financial model. However, some annual spare parts and bike replacement has been included for theft, vandalism and regular wear and tear.

## System Revenue

There are three basic drivers of system revenue: annual membership, casual membership, and usage fees. For revenue forecasting, the pro-forma assumes the rate structure shown in **Table 7** that is based on similar pricing structures in other bike share systems and supported by responses to the online survey conducted as part of public outreach. The model of a membership fee, free-ride period, and usage fees for longer rides, has some shortcomings – such as being a potential barrier to entry for lower socio-economic populations.

Other pricing structures should be considered, e.g., a monthly fee instead of annual membership (a model similar to cell phone plans) and / or a “per ride” trip fee similar to how transit is priced.

**Table 7 - Suggested Fee Schedule for Raleigh Bike Share**

	Access Fee	Usage Fees	
		0-30 min.	Additional ½ Hours
<b>Annual</b>	\$80		
<b>24-hour</b>	\$8	\$0.00	\$4.00
<b>Student</b>	\$50	\$0.00	\$2.00

Nevertheless, for this analysis, the traditional pricing structure has been assumed as there is significant data to support related membership and ridership assumptions using this structure.

Revenue drivers and their related model inputs are summarized in **Table 8** and are based on trends observed in peer cities.

### Annual Membership Revenues:

- Annual Membership Fee: the model assumes an \$80 fee to become an annual member. This amount is in the range of current fees in the U.S. and is also near the average rate identified by respondents to the online survey (See Section 3). A \$50 student rate is recommended. However, the model does not predict the number of students that will become members because of a lack of available comparable data from around the country.
- Members per Person: the model assumes that the system will have 0.6 persons / 1,000 residents / 100 bikes purchasing annual membership and growing 10percent annually. This does not include any special membership promotions or group sales to increase membership.

### Casual Membership Revenues

- Casual Membership Fee: the model assumes an \$8 daily fee to become a 24-hour member. This amount is in the range of current fees in the U.S.
- Casual Members per Station per Year: casual members typically find out about a bike sharing system by seeing a station. Therefore, the pro-forma uses the metric of casual members per station to estimate casual members. The model assumes that Raleigh will annually attract 389 casual members per station.

Usage Fees: available data from other U.S. systems was used to estimate revenues coming from system usage fees.

**Table 8 - Performance Metrics for Case Study Bike Share Systems and Raleigh Model Inputs**

	Charlotte B-cycle	Chattanooga Bike Transit System	Washington DC Capital Bikeshare	Spartanburg B-cycle	San Antonio B-cycle	Model Input	Comments
<b>Annual Members / 1,000 Population / 100 bikes</b>	0.4	1.3	0.5	0.8	0.1	<b>0.6</b>	Average
<b>Casual Members / Station</b>	634	277	1051	346	299	<b>389</b>	Average, but omit DC (outlier)
<b>Trips per Casual Member</b>	1.8	1.8	2.1	1.1	Not available	<b>1.7</b>	Average
<b>Trips per Annual Member</b>	27	23	87	8	Not available	<b>19</b>	Average, but omit DC (outlier)

- Rides per Member: data show a range of 8 to 30 rides per year per annual member amongst peer cities (excepting Washington D.C., which has a strong 87 rides per year average). The pro-forma assumes the rate of 19 rides per year for Raleigh. For casual members, data show a range of 1.1 to 2.1 rides per member. The pro-forma assumes 1.7 rides per casual member for Raleigh.
- Percent of Rides Incurring Usage Fees: data show that approximately 30 percent of casual trips and 2 percent of member trips incur usage fees. These numbers are consistent across the systems for which data is public.
- Average Usage Fee Incurred: average usage fee incurred for annual members range from \$4 to \$6 for annual members and \$6 to \$10 for casual members. The pro-forma assumes an average usage fee of \$5 for annual members and \$9 for casual members.
- Percentage of Casual and Annual Member Rides: the forecast output predicts a split of approximately 45 percent of rides made by annual members and 55 percent by casual users. This split is similar to that observed in Charlotte, a peer city to Raleigh. This shows a system that is slightly more aligned to visitors than to residents, as is reflected in many of the comparable systems.

### Forecast Results

Using the inputs above, the pro-forma was prepared to forecast membership, ridership, capital and installation costs, annual operating costs and system revenues. The output was checked against metrics from peer cities (see **Table 8**) to ensure consistency with actual results and then analyzed to understand the funding needs for capital and operations. The forecast results are summarized in **Table 10** including the following metrics:

- Membership and Ridership Metrics:
  - Trips / Bike / Day: used globally to measure system usage. The pro-forma predicts an average ridership of approximately 0.3 trips per bike per day over five years. This is slightly less than the average rate of 0.4 trips per bike per day observed in peer cities.

- Financial Metrics:
  - Farebox Recovery: this factor is important in understanding the financial needs of the system. The pro-forma shows that approximately 34 percent of operating expenses will be recouped through membership and usage fees over the life of the system. This is lower than the peer cities listed in **Table 9** because, except for Washington DC, it is the only system that is privately operated, which is likely incrementally more expensive than a non-profit operated system.
  - User Revenue Split: the pro-forma predicts that user revenues are split approximately 33 percent from annual membership sales / 42 percent from casual membership sales / 25 percent from usage fees. Data for this metric is not released by all cities, however, in most cities this split tends to be approximately 33 percent / 33 percent / 33 percent.

A summary of the five year funding need for implementation of the five phase initial bike share system in Raleigh includes:

- Capital and Installation Costs: \$2.6 million (\$1.6 million for Phase 1 / system startup and \$1.0 million for Phase 2) that includes capital, installation and system startup costs.

**Table 9 - Performance Metrics for Case Study Bike Share Systems and Raleigh Model Results**

	Charlotte B-cycle	Chattanooga Bike Transit System	Washington DC Capital Bikeshare	Spartanburg B-cycle	San Antonio B-cycle	Peer System Average	Model output (Average over 5 years)
<b>Trips per Bike per Day</b>	0.5	0.3	2.9	0.2	0.5	<b>0.4</b>	<b>0.3</b>
<b>Annual / Casual Ridership Split</b>	40%/60%	51%/49%	80%/20%	33%/67%	Not available	<b>51%/49%</b>	<b>45% / 55%</b>
<b>Farebox Recovery<sup>7</sup></b>	52%	26%	98%	32%	48%	<b>40% (omit DC)</b>	<b>34%</b>

- Operating Costs: \$4.5 million to operate for the first five years. This includes operating costs and system upkeep. For Phase 1 system only, \$3.2 million over 5 years.
- Revenue: \$1.5 million earned in membership sales and trip fees during the first five years of operation. For Phase 1 system only, \$1.1 million over five years.
- Operating Fundraising Need: \$2.9 million over five years for the full system, \$2.1 million for Phase 1 only. This represents an average of \$425,000 per year for Phase 1 only, or \$1,400 per bike per year.

Finally, varying the operations cost per dock per month from \$80 to \$120 yields a range of the second year operating funding need from \$290,000 to \$545,000. The full sensitivity tables are shown in **Appendix 2**. The tests show that the factors that most influence operational funding need are:

- The operating cost per dock per month.
- The attraction of casual members (i.e., the number of casual members per station).
- The uptake and price of annual membership. This assumes no offset in demand from raising the price.

## Sensitivity Analyses

The financial model shows that there is a funding shortfall. Capital and installation costs, which are one-time costs, lend themselves to one-time funding sources such as grants or private donations. Nevertheless the choice of vendor or type of equipment may change the capital funding need.

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

- A sensitivity test was conducted on the effect of varying assumptions in the financial model and the resulting impact on the second year operating fundraising need. For example, varying the annual membership rate between \$50 and \$110 and the casual membership price between \$4 and \$12 yields a range of the second year operating funding need from \$365,000 to \$510,000. Varying the uptake of annual membership between 0.2 and 1.0 annual members / 1000 population / 100 bikes and casual members per station per year between 200 and 600 yields a range of the second year operating funding need from \$320,000 to \$560,000.

## FUNDING PLAN

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

### Public Funding

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

<sup>7</sup> Farebox recovery is the amount of operating cost recouped by membership and usage charges.

Table 10 - Forecast Membership, Ridership, and Financial Performance for Phases 1 and 2 of the Raleigh Bike Share Program

	Year 1	Year 2	Year 3	Year 4	Year 5	5-Year Total
<b>Stations</b>	30	30	45	50	50	50
<b>Bikes</b>	300	300	450	500	500	500
<b>Docks</b>	510	510	765	850	850	850
<b>Capital</b>						
Capital Purchase and Installation	\$(1,380,000)	-	\$(976,000)	-	-	\$(2,356,000)
System Startup	\$(267,000)	-	-	-	-	\$(267,000)
<b>Total Capital Cost</b>	<b>\$(1,647,000)</b>	<b>-</b>	<b>\$(976,000)</b>	<b>-</b>	<b>-</b>	<b>\$(2,623,000)</b>
<b>Membership and Ridership</b>						
<b>Annual Members</b>	670	838	1,462	1,689	1,858	
<b>Casual Members</b>	10,270	11,670	18,516	19,450	19,450	79,356
<b>Annual Member Rides</b>	7,492	15,389	22,972	31,035	34,139	111,028
<b>Casual Member Rides</b>	17,458	19,839	31,478	33,065	33,065	134,905
<b>Total Rides</b>	24,951	35,228	54,450	64,100	67,204	245,933
Trips per Bike per Day	0.30	0.32	0.33	0.35	0.37	0.33
<b>Operations</b>						
<b>Bike Share Operating Costs</b>						
Phase 1	\$(475,000)	\$(653,000)	\$(673,000)	\$(693,000)	\$(713,000)	\$(3,207,000)
Phase 2	-	-	\$(336,000)	\$(462,000)	\$(476,000)	\$(1,274,000)
<b>Total</b>	<b>\$(475,000)</b>	<b>\$(653,000)</b>	<b>\$(1,009,000)</b>	<b>\$(1,155,000)</b>	<b>\$(1,189,000)</b>	<b>\$(4,481,000)</b>
<b>Revenues</b>						
<b>Bike Share Revenue</b>						
Phase 1	\$184,000	\$215,000	\$223,000	\$231,000	\$240,000	\$1,093,000
Phase 2	-	-	\$129,000	\$152,000	\$157,000	\$439,000
<b>Total</b>	<b>\$184,000</b>	<b>\$215,000</b>	<b>\$352,000</b>	<b>\$383,000</b>	<b>\$397,000</b>	<b>\$1,532,000</b>
User Fee Recovery	39%	33%	35%	33%	33%	34%
<b>Operations Fundraising Need</b>						
<b>Operating Fundraising Need</b>						
Phase 1	\$(292,000)	\$(437,000)	\$(450,000)	\$(462,000)	\$(474,000)	\$(2,114,000)
Phase 2	-	-	\$(207,000)	\$(310,000)	\$(318,000)	\$(835,000)
<b>Total</b>	<b>\$(292,000)</b>	<b>\$(437,000)</b>	<b>\$(656,000)</b>	<b>\$(771,000)</b>	<b>\$(792,000)</b>	<b>\$(2,949,000)</b>

The Federal Highway Administration has established a web page for addressing the US DOT position on federal funding and bike share.<sup>8</sup> The website presents information on program eligibility and guidance on which programs are authorized for funding under the Moving Ahead for Progress in the 21st Century Act (MAP-21).

Local public funding could also be considered. For example, the City of Columbus used 100% local funds to cover the \$2.2 million capital and first year operating cost of their 30 station / 300 bike share system that launched in July 2013. They did consider state and federal funding through the CMAQ program, but would not have been able to receive funds until 2016 and elected to use local funds to expedite the system launch.

## Private Funding

Private funding sources are various and include grants from private foundations, private gifts and donations from individuals, and private sector investment. These sources are used in many U.S. cities. Private funding makes up approximately five to ten percent of funding in Boulder and Denver. Some other ways the private sector could get involved is through large membership commitments and programs offered by employers, NC State, and the City. This could include:

- Bike share membership tied to existing transit pass programs, e.g., discounted memberships could be offered to NC State students using funds from the student fee.
- Bike share membership could be added to the offerings available to city employees.
- Corporate membership programs can be used to build enrollment by offering reduced annual membership rates and the opportunity for employers to sponsor all or a portion of membership costs for their employees. The City is well positioned to encourage employer support of bike share (corporate memberships or sponsorship) through its Commute Smart Raleigh program.
- Developer incentives could be used to create a mechanism for a development to contribute to capital funding for bike share (including as part of new campus related housing).
- Crowdsourcing through individuals donating or making contributions online. Kansas City B-Cycle

<sup>8</sup> [http://www.fhwa.dot.gov/environment/bicycle\\_pedestrian/funding/faq\\_bikeshare.cfm](http://www.fhwa.dot.gov/environment/bicycle_pedestrian/funding/faq_bikeshare.cfm)

recently raised \$400,000 to help expand the system.<sup>9</sup>

## Sponsorship / Advertising

Sponsorship and/or advertising are an important element of most U.S. bike share systems. It will be no exception in Raleigh and will be required to help fund operations. There are several levels of sponsorship that other cities have been able to achieve. Examples for each of the different levels are shown on **Figure 12** and include:

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

<sup>9</sup> Neighbor.ly Helps Communities Build Better Towns. Accessed on May 16, 2014 at: <http://www.crowdsourcing.org/article/neighborly-helps-communities-build-better-towns-/21377>



Station	Bike	Bike Detail	Website / App	Membership Key
---------	------	-------------	---------------	----------------

**TITLE SPONSOR**  
 Example:  
 New York City

**PRESENTING SPONSOR**  
 Example:  
 Minneapolis

**INDIVIDUAL SPONSOR**  
 Examples:  
 Denver  
 Madison  
 Miami Beach  
 San Antonio



Figure 12- Sponsorship Examples

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

Overall, sponsorship will be required to support the bike share system in Raleigh. The amount that will be able to be generated will depend on the specific assets offered (e.g., whether or not it can include an advertising panel). Based on the business pro-forma, Raleigh must fill a funding gap of \$440,000 per year to support the 300 bikes in Phase 1. This equates to approximately \$1,200 per bike per year. Local companies may be interested in sponsoring stations and larger sponsors (perhaps wanting to get exposure in the student market) may be interested in larger presenting sponsorships. To fill this funding gap, it is recommended that the City amends its current advertising regulations to allow for the use of advertising in bike share stations.

## Possible Funding Plan

The Phase 1, 30 station / 300 bike proposed bike share system in Raleigh will require approximately \$1.6 million in capital funds and ongoing operating funds of approximately \$2.1 million over five years. The following section recommends a potential funding plan for the system and the potential commitments from local agencies and NC State.

### Capital Funding

Grant funding should be sought to fund the City's portion of initial capital for Phase 1. Most grants require a 20 percent local match. Therefore, an application should be submitted for \$1.32 million, with a local match of \$330,000. Federal and state grants would again be sought to fund expansion of the system into Phase 2, a \$781,000 commitment requiring a \$195,000 local match.

Capital funding should also be opportunistic. There may be smaller, more nimble health or social equity focused grants that become available and could be used to fund stations, particularly where there are no obvious funding partners. Similarly, as development or redevelopment occurs, providing a bike share station should become a part of a developer's transportation demand management options. This may require policy changes or incentives to encourage this activity.

### Operations Funding

Funding sources for operations are more limited primarily because grant moneys are typically allocated to capital projects and not ongoing operations and maintenance. Fundraising for operations should consider all available sources including private, philanthropic, sponsorship, and public funding:

- Sponsorship will be an important source of operating funds. Realistically, based on rates obtained in other cities, sponsorship could be expected to generate up to \$600 per bike per year (\$180,000 per year on the Phase 1 system) for title or presenting sponsorship, or approximately \$900,000 over five years.
- Some stations could be funded through direct contributions from private foundations, large employers, business districts, large campuses, developers and interested businesses. Likely, these deals will need to be incentivized with group or discounted membership for employees of these organizations, or providing sponsorship presence on the stations and bikes that they have purchased.
- Private partners could be sought, such as large employers, business districts, large campuses, developers and interested businesses to take part in group or discounted memberships and sponsorship opportunities. Such sponsorship could bring in \$5,000 to \$10,000 per station per year. Assuming the low end of the rate (\$5,000 per station per year) and a 50 percent uptake rate, station sponsorship could generate \$75,000 per year or \$375,000 over five years on the Phase 1 system.
- Local public funding through the City may also be required to fill any operational funding gap.

### Other Strategies

There are several ways to reduce the funding commitment. Capital costs can be reduced through consideration of different vendors and different technologies (note that there could be increases in operating expenses for reductions in capital cost). Most impactful, operating costs can be reduced as shown by very low operating costs implemented by Nice Ride Minnesota. Some strategies include garnering in-kind support, providing discounted or free operating space, and other strategies that have been employed in other cities. Most importantly, in a small operation, employees should be multi-faceted to operate the most efficient system. For example, a marketing manager can also manage customer service. Such flexibility will allow the operation to have a smaller headcount and lower the personnel costs, which are about two-thirds of the operating costs. To ensure that the City also benefits from reductions in costs (not just the operator) and interests are aligned between the City and the operator, it is recommended that the structure of the contract between the City and the operator be time and materials, not flat fee.

# IMPLEMENTATION CONSIDERATIONS

## SOCIAL EQUITY

During the stakeholder and public process, it was emphasized that a bike share system in Raleigh should be designed to serve a large cross-section of the population and neighborhoods outside the Center City core. The system map reflects this goal.

Bike share represents a great opportunity for an affordable transportation option for lower income and minority communities which historically have been marked by low automobile ownership rates and high transit dependency. While bike share systems have typically launched in high demand and revenue generating areas of existing cities, geographic and social equity have become important considerations. The following section identifies strategies for achieving social and geographic equity of a bike share program in Raleigh.

### Barriers to Success of Bike Share in Low Income Communities

The uptake of bike share in both minority and low-income communities has not been significant to date. Bike share programs continue to face challenges reaching these populations, despite a number of innovative approaches. There are several reasons for this:

- **Location and surrounding bicycle friendly infrastructure:** In most systems, bike share stations have been located in high demand and revenue generating locations such as downtown and in more affluent neighborhoods. Low income neighborhoods, typically located on the outskirts of the system, often only receive very few and sparsely situated stations. The stations tend to be located far away from other stations and in areas that do not include good bicycle infrastructure. Therefore, potential trips from these stations do not have convenient origins or destinations and the trip is not necessarily a pleasant one. It will be important for Raleigh to strongly consider how the planning of the system will affect the location and density of stations in low income and minority communities.
- **Digital Divide:** To date, much of the marketing for bike share programs is done online due to limited marketing budgets. This represents a challenge for the jurisdictions

who find it difficult to reach communities that are not regularly online.

- **System access and verification:** Third generation bike share is possible because of the accountability created by the credit card system. However, many people in lower-income communities do not possess credit cards. Potential strategies for access depend on the technology chosen, as well as local partner organizations' willingness to take on financial risk. This is discussed in more detail below.
- **Cultural issues:** Bike share is becoming the mark for sustainable, technology-inspired cities, and is now familiar to well-traveled middle- to upper-class communities. There continue to be many communities within bike share cities that have not yet adopted bicycling as part of their everyday lives, do not know what bike share is, or do not understand it. In many low-income communities, cars are seen as a sign of success, and bicycles may be viewed as signs of poverty. Education and outreach campaigns should be considered to help overcome this obstacle.
- **Cost barrier to entry and communication:** Most bike share systems have an annual one-time fee paid at the beginning of the year. Although it is an extremely affordable way to get around the city, the one-time fee can represent the largest barrier to using the system for a low-income person. Raleigh should focus on offering alternative payment plans such as a monthly option.
- **Financial sustainability and incentives:** The financial incentives for the city and operator have traditionally not been focused on reaching out to low-income or minority communities. Because they typically must launch quickly for political reasons and have access only to low budgets or must be financially self-sustaining, they tend to focus their outreach resources on early-adopter, downtown and tourist markets which must generate enough revenue to cover the costs of implementation and operation. Outreach programs to low-income and minority communities have typically been high demand and high resource consuming programs which can take a big toll in the total marketing expenditures. Raleigh should consider how the proper alignment of equity

goals with the incentives offered to a potential operator can help with the marketing and promotion of the system throughout these communities.<sup>10</sup>

## Examples from Other Cities

To date, several cities have implemented equity strategies. These include:

- Discounted memberships: Many cities offer some sort of discount for low income populations. They may be subsidized (in Boston, by the Centers for Disease Control, and as low as \$5), or not subsidized. Residents of the New York City Housing Authority and various Community Development Credit Unions receive approximately 30 percent off, or \$65 memberships.
- Station locations: Many cities have located stations targeted in low income neighborhoods. Typically, these stations have not seen impressive ridership due to lack of nearby stations, lack of bicycle infrastructure, lack of targeted marketing and other unknown reasons.
- Access for residents without credit cards: Credit cards (or debit cards with a credit card symbol) are required by bike share systems to become members and check out a bicycle. These cards create the fundamental accountability that makes bike share possible. Although many systems have discussed possible programs, only Capital Bikeshare to date has implemented a program to address this issue. The Bank on DC / Capital Bikeshare partnership gets unbanked people into the banking system, and then offers them a credit / debit card and a discounted bike share membership.
- Bike loan program: Nice Ride Minnesota has identified that automated bike share may not be the solution for all communities. They have implemented an “orange bike” bike loan program, with the goal to get people riding.
- Jobs program: Divvy in Chicago has implemented a unique employment program for lower income individuals. Because bike share is a seasonal business, there is often a need for only part-year employees. Divvy has partnered with The Gap. People in the jobs program can work for the bike share

program for the good weather months, and then work with The Gap during the holiday season to provide for full time employment. Other programs have jobs programs for people coming out of prison.

- Outreach: Philadelphia has implemented a site-focused outreach program for station locations prior to system implementation. This outreach includes door-to-door outreach to ensure input from all members of the community, not just in the highly populated Center City.

## Recommendations for Raleigh

To achieve the goal of equity for Raleigh, some existing strategies should be employed, and some new ones implemented. The overall goal is to create an inclusive system that incurs a feeling of ownership in all communities in which it is located.

- Station locations: the recommended system map includes weighting of census tracts of low-income communities. Within the proposed phasing 28 percent of all stations would be installed in low income and minority areas. Additionally, when fully implemented, the proposed 50 station system would serve around 15 percent of all minority communities in the City.<sup>11</sup>
- Discounted memberships: Raleigh should work with the system operator to offer a certain number of discounted memberships for the system. It should be noted, though, that too many low-priced memberships can be detrimental to the financial sustainability of a system, as there will not be enough revenue to support operations. Therefore, it may be reasonable to consider subsidizing such memberships for a robust program.
- Credit card access – the issue of credit card access is limited or enabled by the background technology. For example, some bike share systems technically require a credit card to create an account. Others require it by policy only. Raleigh must work with the equipment provider to understand whether an account can be created in the system without a credit card. If this is possible, then partner organizations and a small amount of funding can be set up to allow access to people without credit cards with

<sup>10</sup> It should be noted that in 2014, the City of Philadelphia, NACTO and People for Bikes were awarded a \$5.9 million philanthropic grant to focus on social equity in bike share. This is the first significant expenditure on this topic. Uses of funds include station

locations, marketing and outreach, a program that allows for access for people without credit cards, research and national matching grants.

<sup>11</sup> Based on place of residence.

proper identification verification and escrow funding for financial accountability.

- Marketing and outreach – although many systems have made some efforts towards creating an equitable system, few have earmarked specific funding for significant marketing and outreach for low income communities. Non-digital marketing can be more expensive than the typical online approach using websites, earned media and social media. A key aspect of successful marketing and outreach is budget dedicated funding for this effort. In addition, two other important characteristics are as follows:
- Local champions: It will be important to the success of the outreach strategy to identify individuals within targeted communities to adopt bike share and spread the word in the specific communication means in their communities. These folks could be political figures, community organizers, or even committed individuals with a proven means to influence their local communities. They can also advise the operator on the best messaging and means to communicate to their communities.
- Community organizations: The bike share program should work closely with these organizations to maximize outreach, membership, ridership and impact in all communities. It is possible that, as Nice Ride found, bike share is not the solution for all neighborhoods, and these organizations can help tailor solutions for greater cycling uptake for each applicable neighborhood.
- Jobs - A jobs program can be included as part of the bike share system, to include people from all communities at all levels of the organization. One or two strong jobs partners for the bike share program should be identified and work on the program most applicable for Raleigh.

## CONTRACTUAL CONSIDERATIONS

There are many different types and structures of bike share contracts that have been utilized in systems around the country. Following are some contractual considerations for the City as it moves forward.

### Equipment and Operations Contract Structure

To date most US cities have “coupled” operations and equipment contracts so that there is one

contract between the City and the operator, and the operator has a subcontract with the equipment vendor. However, some cities are beginning to consider splitting them out and having two contracts – one with the operator and one with the equipment vendor. Below are some advantages and disadvantages to each structure:

- **Single contract:** In this structure, the City has one contract with an operator. Typically in this situation, the system operator is the prime contractor and the equipment vendor is the subcontractor. Most cities prefer this simple structure because it allows for only one procurement process and one accountable party. However, in some cities this structure has led to significant issues when the equipment vendor has failed on its commitments while not having a direct contract with the City. If the subcontract between the operator and equipment vendor is not strong or does not exactly mirror the prime contract, such issues can arise.
- **Two contracts:** In this structure, the City holds two separate contracts – one with the operator and one with the equipment vendor. This less common structure is significantly more complicated, requiring multiple procurement processes and more contract management. It also requires some relationship between the two contracted parties, and could lead to issues between the two contractors if technical issues arise.

As Raleigh is undertaking a bike share system for the first time, a simpler and more common single contract structure is more realistic. However, the City may consider taking steps to ensure increased accountability by the equipment vendor by including them in all contract negotiations on pricing, service levels, delivery and others activities, as well as requiring review and signoff on the subcontract between the operator and the vendor.

### Operational Contract Types

The City of Raleigh may consider different payment types for the operations contract specifically. This option has been implemented in different systems:

- **Flat fee:** In this contract type, the City and the operator negotiate a flat fee, typically on a per-docking point basis, for operations. This structure requires heavy negotiation on the front end, but tends to be more manageable to administer after implementation. The

relative price of this structure depends on the negotiations but can end up being more expensive for the City as the operator may need to be conservative in estimating the operating costs for a system that does not yet exist. Additionally, operational costs for system expansion may end up being multiplied linearly (per docking point) and it may be difficult for the City to save on operating costs due to economies of scale.

- **Time and materials plus:** This contract type is more typical of consulting services. In this type of contract the operator charges its personnel and costs directly to the City with an additional amount of profit margin. This type of contract can be cost-saving in the long run as it allows the City to take advantage of economies of scale. The contract may also help align incentives for the operator and the City to operate efficiently if the profit margin is flat (not calculated off of dollars spent). This contract type, however, requires the appropriate checks and balances for the operator to

accurately and transparently track and report expenses, as well as more administration by both the operator and the City.

Overall, the second contract option presents less risk to the City in the earlier years when operational costs are unknown. Once a base operational cost is understood, the City may revert to a flat fee to minimize administration over the long run.

## IMPLEMENTATION TIMELINE

Following is a potential implementation timeline for a bike share system for Raleigh, showing a total timeline to launch of Phase 1 of approximately 18 months:

The most difficult and unpredictable step of this process is identifying and securing the funds for capital and operations. Whether this process is undertaken in series or parallel with the procurement process will be at the discretion of the organization that owns the system.

Table 11 - Potential Implementation Timeline

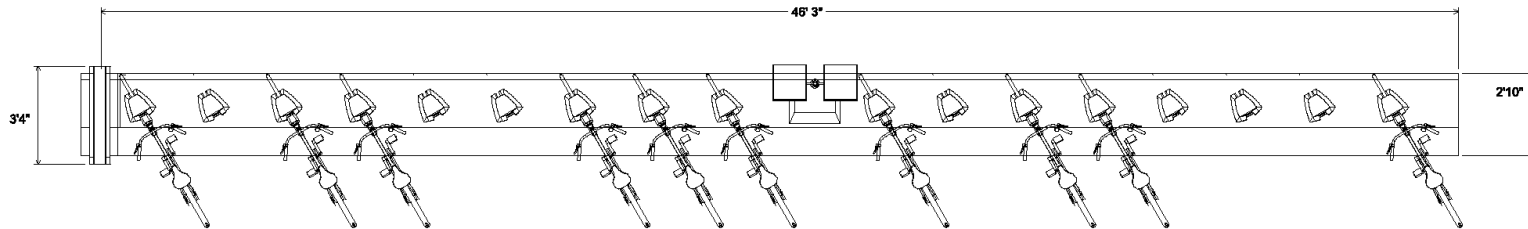
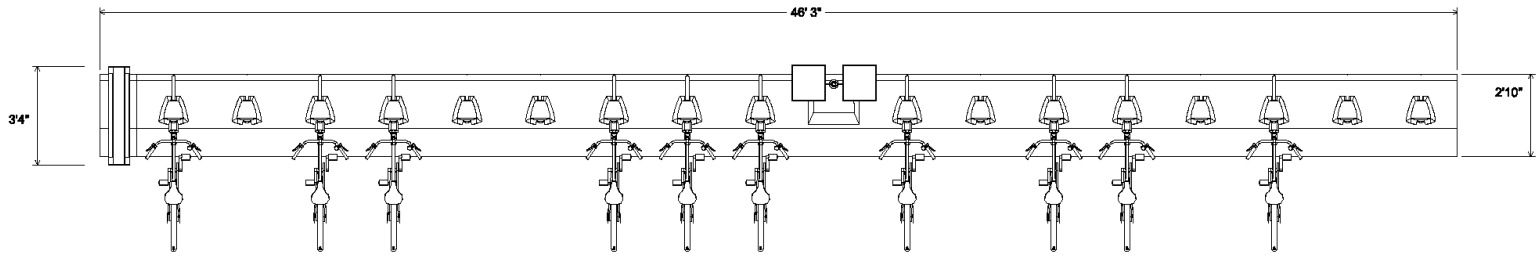
Critical Path Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Decision on governance structure and funding plan																		
Identify funds for system installation, equipment and operations, including sponsorship																		
Develop procurement documents																		
Issue Request for Proposals for equipment and/or operations																		
Award and sign contract for equipment and/or operations																		
Site planning and community outreach																		
System manufacture, preparation for operations, installation and launch																		

## APPENDICES

## APPENDIX 1 – SAMPLE STATION LAYOUTS



### Typical Station Dimensions



DATE:	JUNE 2014
DRAWN BY:	
CHECKED BY:	
REVISIONS	
NO.	DATE
SCALES	
HORIZONTAL	1" = 10'
VERTICAL	1" = 10'
PROJECT	
PROJECT NO.	
DRAWN BY:	
CHECKED BY:	



**Engineering NC, P.C.**  
 Transportation  
 Land Development  
 Environmental Services  
 4000 WestChase Blvd, Suite 530  
 Raleigh, North Carolina 27607  
 919.823.0128 • FAX 919.829.0129  
 NC License No.: C-3705



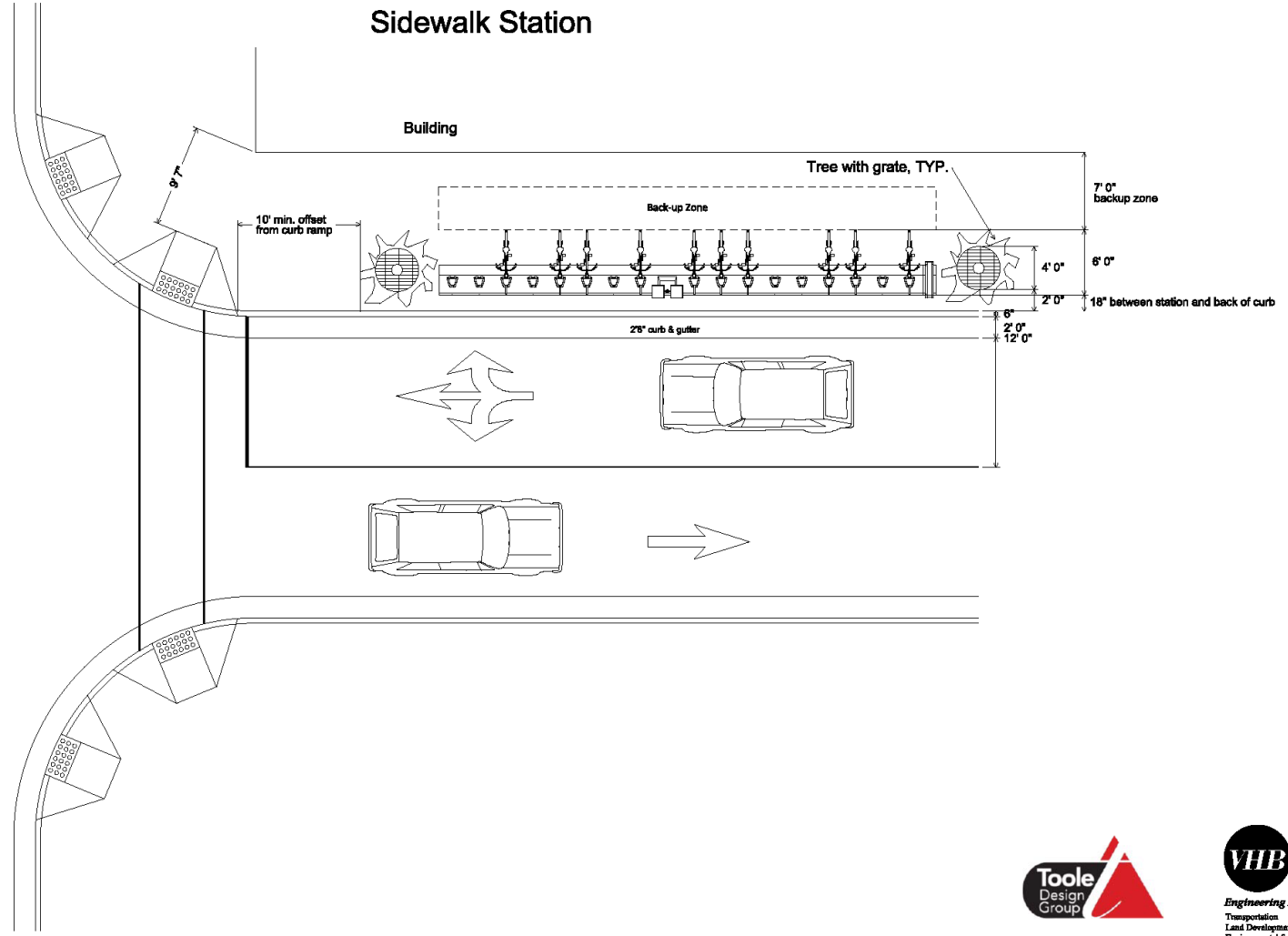
SIDEWALK STATION

Raleigh Bike Share  
STATION LAYOUTS

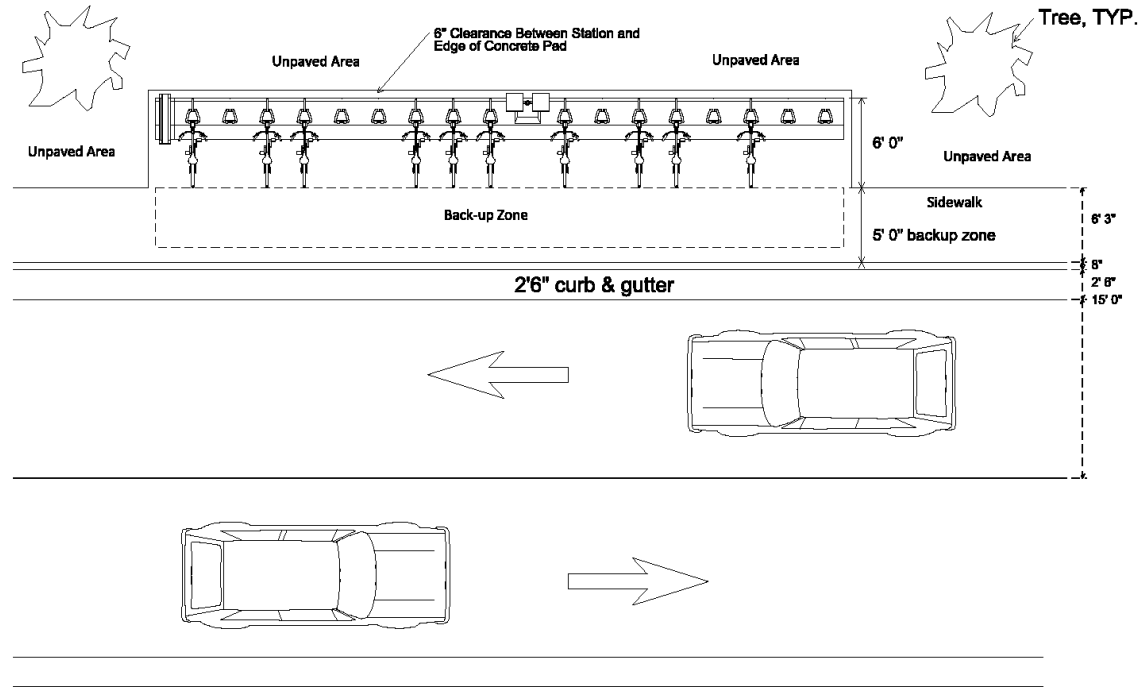
DATE:	JAN 2014
DESIGN TEAM:	
ENGINEER:	
REVISIONS	
NO.	DATE
SCALES	
SCALE 1" = 1'	
SCALE 1/4" = 1'	
SCALE 1/8" = 1'	
SCALE 1/2" = 1'	
SCALE 3/4" = 1'	
SCALE 1" = 1'	
SCALE 1 1/2" = 1'	
SCALE 2" = 1'	



**Engineering NC, P.C.**  
Transportation  
Land Development  
Environmental Services  
4000 Wortham Blvd, Suite 530  
Raleigh, North Carolina 27607  
919.829.0328 • FAX 919.829.0329  
NC License No.: C-3705



## Station on Unpaved Area with Concrete Pad



DATE	APR 2014
DRAWN BY:	
CHECKED BY:	
REVISIONS	
NO.	DATE
SCALES	
HORIZONTAL	1" = 40'
VERTICAL	1" = 8'
PROJECT	
DRAWN BY:	
CHECKED BY:	





DATE: JUNE 2014

DRAWN BY:

DESIGNED BY:

REVISIONS

NO.	DATE

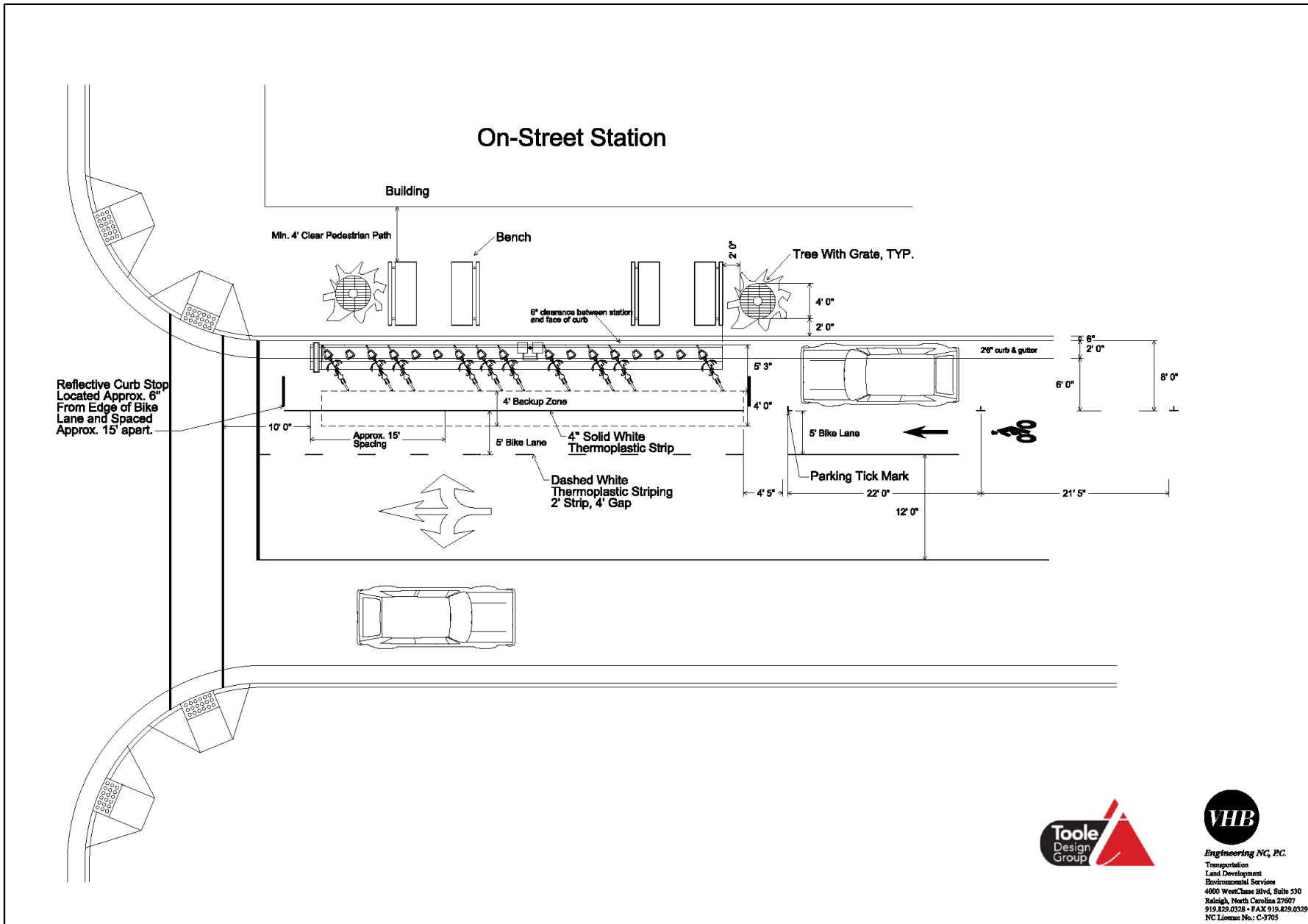
SCALE:

SCALE: 1" = 8'

PROJECT:

DRAWN BY:

DESIGNED BY:



**Engineering NC, P.C.**  
 Transportation  
 Land Development  
 Environmental Services  
 4000 WestChase Blvd, Suite 530  
 Raleigh, North Carolina 27607  
 919.829.0328 • FAX 919.829.0329  
 NC License No.: C-3705

## APPENDIX 2 – SENSITIVITY TABLES

### Year 2 Operating Shortfall

		if the Casual Membership Price is...				
		\$ 4	\$ 6	\$ 8	\$ 10	\$ 12
and the Annual Membership Price is...	\$ 50	\$509,228	\$485,888	\$462,548	\$439,208	\$415,868
	\$ 60	\$500,853	\$477,513	\$454,173	\$430,833	\$407,493
	\$ 80	\$484,102	\$460,762	<b>\$437,422</b>	\$414,082	\$390,742
	\$ 90	\$475,727	\$452,387	\$429,047	\$405,707	\$382,367
	\$ 110	\$458,976	\$435,636	\$412,296	\$388,956	\$365,616

		if the Annual Members per Population is...				
		0.0002%	0.0004%	0.0006%	0.0008%	0.0010%
and the Casual Members per Station is...	200	\$554,502	\$531,655	\$508,807	\$485,960	\$463,112
	300	\$516,732	\$493,885	\$471,037	\$448,190	\$425,342
	389	\$483,117	\$460,269	<b>\$437,422</b>	\$414,575	\$391,727
	500	\$441,192	\$418,345	\$395,497	\$372,650	\$349,802
	600	\$403,422	\$380,575	\$357,727	\$334,880	\$312,032

		if the Operations Cost per Dock per Month is...				
		\$ 80	\$ 90	\$ 104	\$ 110	\$ 120
and the Casual Members per Station is...	200	\$360,206	\$423,242	\$508,807	\$549,314	\$612,350
	300	\$322,436	\$385,472	\$471,037	\$511,544	\$574,580
	389	\$288,821	\$351,857	<b>\$437,422</b>	\$477,929	\$540,965
	500	\$246,896	\$309,932	\$395,497	\$436,004	\$499,040
	600	\$209,126	\$272,162	\$357,727	\$398,234	\$461,270