
# Bike Sharing Analysis: Niagara Falls, NY

January 2018

Submitted To:
Anthony Vilardo, City of Niagara Falls
Thomas DeSantis, City of Niagara Falls

Submitted By:
Michael Galligano, CEO, Shared Mobility Inc.
Maureen Hahn, Lead Researcher, Shared Mobility Inc.

*(Blank Page)*

**BIKESHARE SYSTEMS: ARE THEY SUITABLE FOR YOUR CITY?**

*Over the past several years, bike sharing has become increasingly popular in the United States as more and more communities have come to view it as both a vital amenity and effective mode of public transport. According to an April 2016 report from the USDOT, over 100 US cities now boast their own bikeshare systems. As the industry has grown, it has also expanded beyond the large, dense regions like New York City and Washington D.C., where it was initially successful, into small and mid-sized cities such as Ann Arbor, MI, Tempe, AZ and Fort Collins, CO. These cities have demonstrated that bike sharing can be possible, and successful in communities of all sizes.*

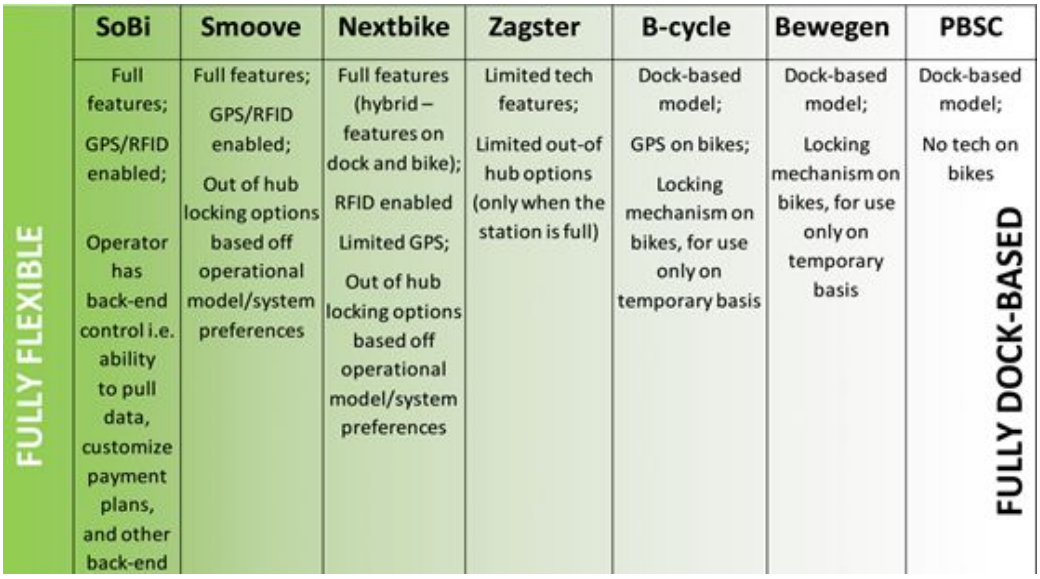
**THE DIFFERENCES BETWEEN DOCK-BASED AND FLEXIBLE BIKESHARE SYSTEMS**

- ***A dock-based, traditional bikeshare system*** has stations that are technology-enabled with GPS and a RFID locking mechanism. Often these stations have an electronic kiosk for casual users to pay for and check out a bicycle, and a locking mechanism on each dock so that a user can unlock a bike with a RFID card or by registering at the kiosk (with a credit card). These stations track bikeshare usage and are able to detect when a station is full and needs rebalancing. Dock-based systems traditionally require the user to check out and return the bike at stations, opting to place tracking technology in the station and not the bikes. In hybrid systems (such as Pittsburgh's NextBike system), both the bike and dock are technology-enabled, which allows cities to operate a dock-based system, a flexible system, or both.

*Manufacturers of dock-based systems: B-cycle, Bewegen, PBSC,*
*US Cities with a dock-based system: Boston, DC, New York, Miami, Denver*

- ***A flexible bikeshare system*** features bikes equipped with self-contained locking mechanisms. Such systems are often either technology-enabled with GPS and a RFID locking system usually paired with a lock, or hardware on the wheel which enables the user to lock the bike with an app. Many college or corporate campuses operate a flexible bikeshare system with "dumb docks" or basic docks with no technology, where bikes can be easily located by users. Flexible systems often do not require a docking station.

*Manufacturers of a flexible bikeshare system: Nextbike, Smoov, Social Bicycles, Zagster*
*US Cities with a flexible system: Albuquerque, Boise, Buffalo, Phoenix, Portland, Tampa*




## CITY OF NIAGARA FALLS AND BIKESHARING

The city's population is close to 50,000 residents, but tourism is considered the primary economic force in the area. In 2014, more than $65 million in both state and local taxes were generated solely from tourism revenue (which reduced the tax burden by $735 per household in Niagara County). With the Niagara Tourism & Convention Corporation's future marketing moving towards a more active and adventurous experience of the Falls, a bikeshare that serves tourists and residents alike can be essential in assisting to implement this plan.

**Parking Scarcity**
The central tourist district (south of Niagara St and west of John Daly Blvd) is the main source of parking scarcity. For tourists staying overnight at the hotels in the area, bike racks located near the major hotels will help mediate the concentration of parking near Old Falls St and the Rainbow Bridge.

**SWOT Analysis**
*Strengths*: Concentrated tourism, extensive trail system, regional system adjacent to Buffalo's Reddy Bikeshare
*Weaknesses*: Lack of bike lanes throughout city, weather, population density
*Opportunities*: Attainable sponsorship based upon the legacy of Niagara Falls, socioeconomic impact, emission reduction, integration with transit, partnership between Niagara Falls, Ontario for an international bikeshare
*Threats*: Community adoption, affordability for residents

**Community Adoption and Affordability**
There are challenges to community adoption for residents in a city with limited bike culture and number of protected bike lanes. However, with an introduction of a bikeshare in the tourism areas, there is room for residents to utilize the benefits as well. In terms of affordability for residents, there are similarities to Jackson Hole, WY in which the bikeshare plan included small subsidies specific for residents in the tourism-dense city, which could be drafted into the system's plan.

**Current Bike Rental Locations**
Niagara Falls Bike Rentals on Old Falls Street is

currently the only bicycle rental system in the area. Where a bikeshare improves upon this is that the newer technologies can provide a 24-hour rental/transportation service that gives more access to the users

**Niagara Scenic Parkway**

Engaging with the Niagara Falls State Park is the leading activity for tourists. The Niagara Scenic Parkway is part of the Park but also extends along the Niagara River. The availability of bikes at different points along the trail would help connect attractions such as the Goat Island, Niagara Gorge Discovery Center, Devil's Hole and LaSalle Waterfront Park. Visitors would also have a new way to discover and access the hiking trails going into the Gorge and alongside of the Niagara River.

**ESTIMATES**

Based on a preliminary analysis of Niagara Falls, NY, SMI estimates bike sharing is feasible here with an introduction of approximately 115-150 bikes for an initial launch. Bikes will be mostly dedicated to the tourism areas near the Niagara Falls State Park, but there is room to branch into the city core for residents at Pine Ave and Main St. SMI believes large interactions with a bikeshare will be at areas that go along the Niagara Falls Scenic Parkway and inside the Niagara Falls State Park due to the amount of foot traffic and tourism. Moreover, the stations at Third St & Niagara St and Portage Rd & Main St will encourage tourists to explore the city and spend locally. Like most bike sharing launches, location placement and expansion usually occurs after year 1 (proof of concept stage). SMI sees expansion into more community neighborhoods as demand increases and bike infrastructure increases.

| POTENTIAL LOCATIONS | | | |
|---|---|---|---|
| **LOCATION** | **NUMBER OF BIKES** | **LOCATION** | **NUMBER OF BIKES** |
| Niagara Falls State Park | 20-25 bikes | Third St & Niagara St | 5 bikes |
| Goat Island Pedestrian Bridge | 10-15 bikes | 222 Rainbow Blvd (Haunted House of Wax) | 5-10 bikes |
| Old Falls St Entrance into Park | 10-15 bikes | Niagara Gorge Discovery Center | 10-15 bikes |
| Niagara Tourism & Convention Corporation | 5-10 bikes | Portage Rd & Main St (Why Coffee Shop) | 5 bikes |
| Rainbow Blvd & Niagara St | 5 bikes | LaSalle Waterfront Park | 4 bikes |
| Goat Island | 5-10 bikes | Old Stone Chimney | 4 bikes |
| Old Falls St & Third St (Rainbow Café) | 5-10 bikes | Niagara Falls Memorial Medical Center | 4 bikes |
| Third St & Rainbow Blvd | 5 bikes | Niagara St & Memorial Pkwy | 4 bikes |
| Pine Ave & 18th St | 5 bikes | Niagara St & 25th St (DQ Grill & Chill) | 4 bikes |


Figure 1. Hubs near or on the Niagara Falls State Park


Figure 2. Expanded view: Main Street, Pine Ave, Old Stone Chimney,
Niagara St, LaSalle Waterfront Park, and the Niagara Fall Memorial Medical Center

- Established by the table and maps above, SMI has divided them into four separate categories. The blue bicycle icons represent racks that would be placed throughout the Niagara Falls State Park. Because of the high amount of tourism traffic in the area, we recommend that some, if not all, of these racks should have swipe kiosks attached to them. Kiosks should be reserved for areas of mass density to keep the costs of operations low.

- The icons highlighted in pink represent racks surrounding the park, including along Old Falls Street, major hotels, and the Seneca Casino. Bikes at intersections such as Third St & Niagara St are placed there for their visibility and accessibility to both overnight and day tourists.
- To reach and accommodate for the trail system, three potential racks (displayed in orange) could be installed along the trails. The Niagara Gorge Discovery Center is an ideal location for racks because it is along the path of the Niagara Scenic Parkway. Combined with the large parking lot that is next to the center, this could be an ideal option for a 'Park & Ride.' The same idea can be applied to the other two orange racks (LaSalle Waterfront Park and the Old Stone Chimney attraction).
- Finally, to encourage use for residents as well, bike racks (highlighted in green) can be installed in locations where residents have the most access to them. For example, a rack in front of the Niagara Falls Memorial Health Center facing Pine Street can be utilized by employees on their lunch breaks as well as those who may need to visit the center.

Initial launch of bike sharing in Niagara Falls is based on demand, population density, attractions, bikeability, walkability, and access to transit. As bike sharing matures, expansion into neighborhoods originally considered 'less feasible' can be considered with the use of system revenues, and/or public dollars.

| **BIKESHARING PRECEDENCE WITH CHARACTERISTICS SIMILAR TO NIAGARA FALLS** | |
|---|---|
| **Jackson Hole, Wyoming**<br>Number of bikes: Demonstration of 35 bikes<br>Manufacturer: Projected Launch 2017<br>Note: Jackson Hole utilized a demo staging for the feasibility of a bikeshare in this tourism-dense city after completing an extensive bicycle improvement plan. While a full-system has not been implemented yet, the tourism draw to this city is similar to that of Niagara Falls. | **SoBi Long Beach, Long Beach, New York**<br>Number of bikes: 150<br>Manufacturer: Social Bicycles<br>Note: Tourists normally visit between April and September and typically originate from New York State. As well as sharing similar types of visitors, Long Beach is similar to Niagara Falls' climate and thus, their operational timeline. |
| **Reddy bikeshare, Buffalo, New York**<br>Number of bikes: 250<br>Manufacturer: Social Bicycles<br>Note: Buffalo's Reddy system has very similar community demographics as Niagara Falls, including climate. | **We-Cycle, Aspen, Colorado**<br>Number of bikes: 125<br>Manufacturer: B-Cycles<br>Note: Aspen is similar to Niagara Falls in terms of both size and tourism numbers. |

**Partnerships**
For a bike sharing system to be successful in Niagara Falls, NY, both public and private collaborations with the bike sharing operator is required for success.

Public Organizations
The City of Niagara Falls must allow access to public right of way, and allow advertisement to be located on public space. All bike sharing cities make an exception to advertisement as private advertising sponsors usually pay for the system operations. That being said, it is not uncommon for public entities to implement some oversight that controls size, color, placement, etc. Moreover, New York State Parks, Recreation and Historic Preservation will also need to be at the table during design and deployment of the hubs. Since Niagara Falls State Park system will be a very popular destination, conformity to Park official wishes and recognition of impacts on this historic park, must be addressed early in the development of the system.

Private Organizations
Hotel chains are huge assets that will make bike sharing in Niagara Falls sustainable. This could not only entice more people to visit, but help with traffic mediation by encouraging tourists to leave their vehicles parked and ride bikes instead. Local businesses will also be crucial to the success of the program. Not only by promoting bike sharing at the community level, but also creating community economic impact by encouraging people to explore beyond the immediate Falls and shop and buy locally within the City.

Nonprofit/Community Organization
Input from biking groups, community organization and block groups all play a role in the success of bike sharing. Bike sharing not only is a healthy option to get around, but also spurs economic impact to cities and neighborhoods. Neighborhood groups need to be at the table in terms of launch of the system and expansion of systems.

**Funding Pathways**

**STARTUP CAPITAL**

***Private Sponsorship***
Private sponsorship has been also utilized to launch bike sharing across the country. Private sponsorship are varied based on market size and type of sponsorship. Many sponsorships pay for the upfront cost of the bikes and operational costs associated with them.

- Independent Health's exclusive sponsorship of Reddy bikeshare in Buffalo, New York (200 bikes)
- Citi Bank's exclusive sponsorship of Citibike in New York, New York (6,000 bikes)
- Nike's exclusive sponsorship of Biketown in Portland, Oregon (1,000 bikes)
- Hulu's exclusive sponsorship of Breeze Bikeshare in Santa Monica, California (500 bikes)
- Select Health and St. Luke's Hospital dual sponsorship of Green Bikes in Boise, Idaho (100 bikes)
- Many hub based sponsors in Hamilton BikeShare in Hamilton, Ontario (800 bikes)

***Public Investment***
Many bike sharing organization obtain funding for implementation costs from the public sector. Noteworthy funding pathways include:

- Pittsburgh, PA received a $1.6 million Congestion Mitigation & Air Quality (CMAQ) grant and a local match through philanthropic donations to the not-for-profit owner/operator Bike Pittsburgh, as well as two title sponsorships from healthcare companies.

- Boise Idaho's bike sharing program received funding through Transportations Alternatives to support over $300,000 worth of investment capital.
    - Biggest threat to Boise's Bicycle Sharing project is financing - BBSP is exploring the feasibility of linking bikeshare membership with mass transit rider sales. Paring a bus pass with a bikeshare pass would generate additional riders. Additionally, BBSP can link other commuting modes such as ACHD Commuteride, vanpools and carpools, to generate additional long-term users.
    - http://www.compassidaho.org/documents/comm/FY2015TIPrpt.pdf
    - http://www.cityofboise.org/city_clerk/100912/bikeplan.pdf
    - http://itd.idaho.gov/ContractingServices/TAP/default.htm

- Funding for the MountainRides SoBi system used $20,000 of a $472,000 EPA grant to help launch an initial pilot of 16 bikeshare bikes in two communities (Hailey and Ketchum, Idaho) in 2012.

- Research Funding. Reddy bikeshare, located in Buffalo, NY, received funding for a 75 bike pilot system that was used to research carbon reduction due to bike sharing (New York State Energy and Research Agency). This helped jumpstart operations and eventually led to a bigger system that is privately sponsored.

*Many bike sharing organization receive funding from both public and private investments.*

**POTENTIAL SPONSORSHIPS**

Tourism appeal will prove to bring multiple interested sponsorships to the table. Unlike cities that do not have the tourism appeal, an international brand would be attracted to the marketing ability of sponsoring a bike sharing system. The City of Niagara Falls, NY receives over 10 million unique visitors per year.

- Active Brand: We see a company that is interested in active living and moving be plausible. Redbull, even though may not be the best fit, may be interested in biking around Niagara Falls.
- Car Manufacturers: a vehicle manufacture may also be interested in sponsorship of bike sharing in Niagara Falls as they are interested in transportation. Tesla, for example, not only prides itself of zero-emission vehicles and transportation options, but also has direct historical ties to Niagara Falls. Car manufacturers have sponsored bike sharing in the past.
- Airlines: An international airlines may be interested in potential sponsorship of a system.
- National/World Banks: Banks have been popular sponsoring agencies for bike sharing. Considering the international tourists a bank such as HSBC may be a good fit for a sponsorship of the bike sharing system.

**RECOMMENDATIONS FOR NEXT STEPS**

- Based on the size, tourism impact, and density of Niagara Falls, an affordable flexible system would be the preferred choice. Currently there are four vendors that are the leaders in flexible systems: NextBike, Smoove, Social Bicycles and Zagster.
- The City must adopt basic regulations that can enable bike sharing as well as encouraging community engagement in a public participation process. This could also include development of regulations for on-street bike hubs. Exclusive operator status might be considered for the duration of the contract.
- A range of 115-150 bikes is a workable estimated number. The amount of bikes can be increased dependent on use and community adaptation.
- Consider working with Niagara Falls, Ontario to create an international bikeshare system that would have the added benefit of opening up sponsorship potential.
- Multi-language systems on the bikes (as well as marketing and signage) should be considered due to the presence of international tourists.
- A seasonal system should be adopted which aligns with the peak of the tourism May-October,
- To help with the costs of the implementation of the project, applications for public grants such as CMAQ (Congestion Mitigation & Air Quality Improvement program) can be conducted due to the environmentally conscious focus of bike sharing.
- Allowing for swipe kiosks to be at some of the hub locations, mainly those that are within high traffic areas, will help to reduce the costs of operations. It is recommended that swipe kiosks be located at the hubs within the Niagara Falls State Park.
- Subsidized use of the bikeshare system for residents is a tool that other cities have used to help encourage usage for residents in areas with lower amounts of bike infrastructure. This will still maintain the captured revenue from tourists while supporting and encouraging the residents that surround the attraction. For example, any resident will receive a 50% discount to membership due to revenue generation of the system.
- After initial launch, focus on community outreach and expansion into neighborhoods that are not considered currently feasible' by bike sharing standards. SMI believes there are many communities within the City of Niagara Falls that would support bike sharing with proper outreach and marketing.

## *APPENDIX*

### *BIKESHARE VENDOR OVERVIEW*

The bike sharing industry has become much more diverse in recent years, as the number of operators continues to grow. Some companies specialize in a specific type of model, such as electric bike sharing, while others offer a wide range of products. However, most providers tend to specialize in either dock-based or flexible systems.

The following section contains an overview of the leading bike sharing providers currently operating in North America. Also, while some companies such as Motivate, Smoove and Cyclehop specialize in managing bike sharing, this section is focused only on bike and tech manufacturers.

#### DOCK-BASED BIKESHARE MANUFACTURERS

**B-CYCLE**

- **Overview**: B-cycle is a U.S.-based public bicycle sharing company that is very experienced in small and midsize city dock-based bikeshare deployments. B-cycle also recently launched a larger system in Philadelphia.
- **US Locations**: 31 cities across U.S., mainly small midsize cities. Selected as vendor for Los Angeles Metro's regional system.
- **Largest US System**: Indego Bikeshare in Philadelphia, PA with 700 bikes/73 stations. The system will add 300 bikes/24 stations in 2016. B-cycle has the highest-used system in the U.S. with Great Rides in Fargo, ND, which set a record of 20 checkouts per bike/per day.
- **Technical features**: GPS-enabled bikes (B-cycle's newest model is currently only in Philadelphia, PA and in the pre-launch cities of Los Angeles, CA and Las Vegas, NV), electro-mechanic locking mechanism on dock, integrated front lock for temporary parking (although operates as a dock-based system). Kiosks are solar powered and accept walk-up users. Members can check out bikes with RFID swipe card at docks.

**BEWEGEN**

- **Overview**: Bewegen, a Canadian company, is the first company to provide an electric-assist "pedelec" bikeshare model.
- **US Locations**: Bewegen is currently operating in one US city (Birmingham, AL) and has been selected as a vendor for Baltimore, MD and Richland, VA.
- **Largest US System**: Birmingham, with 250 bikes/25 stations.
- **Technical Features**: GPS-enabled bikes, "pedelec" model, solar features on dock for recharging electric-assist bikes, touch-pad options on handlebars for RFID swipe card and battery level information. Integrated front lock allows for parking at full station, but system operates as dock-based model.

**Notes**: Little experience in US main differentiator is pedelec model. Bikes very expensive even for a dock-based model due to cost of electric-assist components, and very heavy for the same reason.

*Figure 2. Example of a dock-based system bike, Capital Bikeshare (Motivate).*

**PBSC URBAN SOLUTIONS**

- **Overview**: More than 45,000 bikes in operation worldwide. In 2013 the Bixi system in Montreal went bankrupt due to supplier issues, then was bought by a Canadian company and renamed PBSC Urban Solutions.
- **US Locations**: PBSC has the most extensive experience in North America's largest cities, including New York, Chicago, and Washington, DC. PBSC is now also offering a pedelec model called "Boost," although this is not yet in operation in the US.
- **Largest US System**: New York's Citi Bike program has more than 10,000 bikes at 600 stations.
- **Technical Features**: RFID-enabled docks, electro-mechanic locking mechanism on docks, solar options for powering kiosks. The 40-42 pound "cruiser" style bicycle has proprietary components including puncture-proof tires, built-in lighting, internal gearset, 3-6 speed options and a shaft-drive that eliminates the need for a chain. New technology includes integration with Cyclefinder and TransitApp for app-based station locating and payment.

*Figure 3. Example of a dock-based system, Nice Ride MN (PBSC)*

## FLEXIBLE BIKESHARE MANUFACTURERS

**SOCIAL BICYCLES (SoBi)**

- **Overview**: SoBi is a relatively new manufacturer, having launched its first pilot in Buffalo in 2013. Since then, SoBi has operated full-scale in several small and mid-sized cities including Hamilton, Ontario, Santa Monica, CA, and Tampa, FL.
- **US Locations**: Public systems in 21 cities, and 2 locations in university settings.
- **Largest US System**: Biketown, Portland, OR (1,000 bikes and 100 hubs).
- **Technical Features**: GPS and RFID-enabled bikes use integrated computer on back of bike, solar battery-powered bikes and kiosks, electro-mechanic locking mechanism with accompanying U-Lock, tech-less stations or hubs. Features wheel dynamo (motor) which recharges battery-powered computer on bike when user is pedaling.

**Notes**: Experience only recently in mid to larger-size cities. Many cities where SoBi is the bikeshare vendor have been testing grounds for new technology, leading initial reporting of results in terms of operator and user experience. One of the most advanced and sustainable flexible bikeshare programs, with a variety of features that encourage fleets with low carbon footprints (i.e. through self re-balancing programs, wheel dynamo recharging feature, solar elements and open data tracking of CO2 emissions averted).

*Figure 4. SoBi "Cruiser" Model.*

*Figure 5. On-Board Computer for SoBi.*


*Figure 6. Flexible bikeshare station with kiosk in Hamilton, Ontario (SoBi).*

**NEXTBIKE**

- **Overview**: Nextbike is a bikeshare company operating out of Germany. As of 2014, it operates about 20,000 bikes in Germany and several other countries around the world. Nextbike has hybrid flexible bikeshare and dock-based options
- **US Locations**: 3 locations in US cities; West Palm Beach, FL Pittsburgh, PA Hoboken, NJ.
- **Largest U.S. System**: Pittsburgh, PA (500 bikes, 50 stations).

- **Technical Features**: Proprietary components and internal brake and shifting cables to minimize vandalism; puncture-proof tires; built-in lighting; internal gearset. GPS and RFID-enabled bikes with integrated hub locking mechanism for out-of-dock locking option. Docks have electro-mechanic locking mechanism, various dock/kiosk options, and are solar powered.

**Notes**: Main operational experience is in Europe. Redundant technology on bike and station has possibility to drive high IT costs and maintenance. The many types of docks and myriad of registration options can create a complicated system for first-time and casual users.

*Figure 7. On-Board Computer for NextBike.*

**SMOOVE**

- **Overview**: Smoove is a European-based company that in 2013 signed a distribution agreement with CycleHop for expansion to North America. In Europe, Smoove is operating in 16 cities with over 20,000 bikes in circulation.
- **North American Locations**: Vancouver, BC (Canada)
- **Technical Features**: Smoove bikeshare systems can work with or without a kiosk, but often operate with either a full dock, or a kiosk and rack. Proprietary components and internal brake and shifting cables to minimize vandalism; puncture-proof tires; built-in lighting; internal gearset, lightweight aluminum frame. GPS and RFID-enabled bikes with integrated cable locking mechanism for out-of-dock locking option. Docks have electro-mechanic locking mechanism, and various dock/kiosk options.

**Notes**: Highly experienced in Europe with no experience in US markets.

*Figure 8. On-Board Computer for Smoove.*

**ZAGSTER**

- **Overview**: Zagster offers "turn-key" solutions, through which the company manages all IT solutions, operations and owns the bikeshare systems, which are leased by cities, corporate campuses or universities.
- US Locations: 145 small programs in corporate/private settings in 35 states, with 3 city networks in Carmel, IN Albuquerque, NM and Fort Wayne, IN. Recently selected as vendor in Fort Collins, CO.
- Largest US System: Largest citywide system will be Fort Collins, CO with 79 bikes/13 stations; largest private system is General Motors' campus (Warren, MI) with 100 bikes/10 stations.
- Technical Features: Limited tracking available through technology-enabled lockbox, smartphone app provides key code for lockbox on bike, allows

users to unlock and lock the bike through U-lock. Lowest startup costs of flexible bikeshare vendors. Low-tech allows for relatively lightweight bike and easier ride. Vendor is scheduled to unveil Bluetooth technology system-wide in 2016.

**Notes**: *Highly experienced in small, private systems for corporate university settings, having only recently gained experience in deploying urban city networks. Bike technology is currently low-tech, providing an affordable turnkey option for small systems/cities, but lacking many of the features of other flexible bikeshare manufacturers, including RFID swipe access and full GPS.*


*Figure 9. Zagster "Cruise" Model.*