WHITE PAPER

Bike Share Implementation Strategies:
A Comparative Guide

Revised October 2013

Introduction

Bike Share systems have been rapidly growing in popularity across the world. Spurred by large and very visible municipal bike share programs in Paris, London, Washington DC, New York City, Denver, Barcelona and many others, bike share has shown the potential to profoundly and permanently shift cultural habits away from automobiles and towards bicycles as an economical, flexible and carbon free transportation alternative. It has spread from municipalities into local commercial installations, as well as into many university and corporate campuses, and resorts.

Successful bike share programs have measured decreases in trips made by automobiles, reduced traffic

congestion, an ability to attract new riders to bicycling, and the ability to improve the health of regular riders of bikes in the program.

However, not all bike share programs have been a success. Some municipal programs as well as those at many university and corporate campuses have never achieved their goals or lasted beyond their first year.

This white paper will review alternative approaches to implementing bike share in your environment, help you select the right approach for your needs, and provide ideas for helping you achieve lasting success of your program.

Keys to Success

At the municipal level, statistics have shown most bike share systems with formalized and properly managed programs have met or exceeded projections for number of participants, number of rides, and miles ridden – all key metrics of success for the system. But at the university and corporate level, bike share has had much more mixed results due to implementations that have largely been informal, underfunded, and hastily planned.

The key to success then is making sure the bike share program is properly planned, funded, implemented and aligned with measureable goals. Only then can bike share become a permanent part of an overall transportation and sustainability plan.

A Cultural Shift

Successful bike share programs have already demonstrated how to reduce our dependency on fossil-fuel based transportation – by becoming a safe, reliable, convenient and affordable transportation alternative. Although each program may have different goals, here is how some of the successful programs are measuring success:

- 43% of Denver B-Cycle users said they replaced car trips with bike rides. (Denver B-Cycle, 2010)
- Velib' reduced Paris traffic 5% in its first year (Bremner, C., and Tourres, M., 2008)
- 89% of Velib' users said it allowed them to move around Paris more easily (Velib', 2008)
- More than 400 jobs are connected to Montreal's Bixi (Bixi, 2010)
- 96% of first-year users of Lyon, France's Velo'V had not ridden in Lyon before (Holtzman, D., 2008)
- 23% of trips on Minneapolis' Nice Ride would have been by motor vehicle (Nice Ride, 2010)
- Bicycling increased 44% in Lyon within the first year it introduced bike sharing (Buhrmann, S., 2008)
- Bicycling increased 70% in Paris since Velib' was introduced in July 2007 (Bremner, C., and Tourres, M., 2008)

Get the Wheels Spinning

Before you can begin evaluating the available options for bike share approaches, it is imperative to define your project parameters and goals. Goals should be clearly defined and measureable. You should also define the team or group that will be responsible for the system, as no matter what approach is selected, every system will require some level of support and attention.

Here are some key points to consider:

1. **Needs** – What is the total population you wish to serve? What is the geographic area that you want to cover? What will be the goals for participation and use of the system, defined as number of rides, mileage ridden, availability of bikes in the system, ease of use, etc? Every situation is different.

2. **Capabilities** – What do you have for resources to get started – bikes, racks, designated locations? Are there in-house resources to support a system – employees, students, facilities personnel? What type of training will be required? Do you have locations that can accommodate system infrastructure – from bike stations to bike storage? What type of information is needed to garner support/approval within your organization?

3. **Budget** – How is the system going to be funded? Will budget be available on an on-going basis, or just a one-time purchase? Will it be a single budget for both the bike share system and the facilities – or will facilities and infrastructure improvements be paid for out of a separate budget?

4. **Goals** – What are the primary and ancillary goals of the system? Can you reduce dependency on existing transportation options such as cars and buses? Can parking facilities be reduced? Can you reduce congestion in pedestrian areas? Can you reduce waste from abandoned bikes? Can you reduce liability from an existing unmanaged shared bike pool? Can metrics be tracked and quantified?

Implementation Options

Once you have defined your project goals, it's time to align your needs, capabilities and budget with the available alternatives.

There are four viable alternative approaches to bike share implementations in university and corporate campus environments, each with its advantages and disadvantages, depending on your situation:

- Ad Hoc
- Bike Corral
- Automated Key Boxes
- Kiosk-Based

Ad Hoc Bicycle Sharing

Ad Hoc bike share systems are a straightforward way to provide non-managed access to a shared pool of bikes. Ad Hoc systems tend to be informal by design, and rely on the integrity of individuals to use and care for the bikes in an appropriate way.

With Ad Hoc implementations, bikes are distributed around the facility or campus. The bikes are typically painted or marked to indicate that they are for shared use. The bikes are not locked, and anyone is free to use the bikes. With the Ad Hoc approach, you do not need much infrastructure to get started – just some bikes. For those on a very limited budget, this is option is alluring. However, despite it ease of implementation, this approach have proven time and again to be the least successful in terms of longevity, reliability, and ridership.

With the Ad Hoc approach, since the bikes are unmanaged, there is no way to know who is using the bikes, how the bikes are being treated, and where they are parked. This makes it difficult to maintain any consistency in availability, or ensure the safe operating condition of the bikes. For this reason, this type of system generally does not last long; the condition of the bikes tends to deteriorate rapidly, and theft and vandalism are prevalent. This type of system is also typically not popular with users of the system because of the unpredictability of where bikes are when needed.

However, most importantly, due to the rapid deterioration of the condition of the bikes, this approach can lead to safety concerns, and expose the university or corporation to liability issues. If an accident occurs on a faulty bike that is part of a sanctioned bike share program, the bike rider could pursue legal action against the university of corporation for not properly maintaining the bikes.

The primary advantage of the Ad Hoc approach is cost – it is the least expensive way to implement a shared bike system, as there is typically no technology or support provided for the system. The main disadvantages of the Ad Hoc approach are a) there is no accountability for users of the bikes, b) bikes are never in predictable locations since they can be left anywhere, c) bikes are easily stolen and vandalized, d) exposure to liability if bikes are not properly maintained for safety.

Bike Corral Style Bike Share

A Bike Corral system is a more formalized, non-automated approach to managed bike share. In this type of system, bikes are kept in a central location and equipped with locks. The keys for the locks are managed by a person at a centralized location – such as at a desk in a lobby of a central building, or at a student center on a campus. This approach is similar to the way libraries operate, with simple check-in and check-out at a manned desk. This type of system also allows the school to gather some information on who is using the system and for how long. It also provides the ability for the school to have students register for the system, sign a waiver, and read through basic rules for system use.

This approach puts more controls and accountability in place than Ad Hoc systems by being able to track who is using the bikes and providing a central hub for the bikes. This type of system can be done with inexpensive technology and manpower, usually in the form of active students.

The primary advantages of this system approach are a) low cost of start-up, and b) centralized management and control. The downsides are a) reliance on dedicated resources to staff a central location for checking in/out keys (which also has a cost associated with it), and b) it limits the convenience of the system because bike users always have to pickup and return the bikes to a centralized location during operating hours – whether or not that location is convenient for the user.

Automated Key Boxes

Automated Key Box style bike share systems are a more advanced approach to managing bikes, user access, and system usage. These systems use geographically dispersed bike stations with electronic key boxes that control access to the bikes. The automated key boxes and bikes are placed in locations near destinations or centers of activity – student centers, libraries, and dining halls – as well as near student housing, parking lots and mass transit locations. With this approach, bikes can be placed in fixed locations where users can access bikes conveniently and consistently.

In the automated key box approach, users must opt-in to the system (including signing a waiver), and access to the system is controlled by administrative software. The

automated key boxes electronically lock and release bikes to authorized users. Each user in the system will have a personal pass code. If a user of the system wants to take a bike, they enter their personal code into the keypad on the key box for the bike they want to borrow. Inside the key box is the key to unlock the corresponding bike.

With this approach, the locks used on the bikes are attached to the bikes, so the bike can then be ridden anywhere and locked to any standard bike rack close to the user's destination. This provides a level of flexibility and convenience to the user. With this system, the user returns the bike to the same location is was borrowed from.

The administrative software for these automated key boxes is typically Windows or Mac based. The software is used to add users to the system, enable or disable user access, download and view user and bike usage, create reports on usage patterns and system status.

The advantages of automated key boxes is:
a) the bikes don't require specially designed bike stations or kiosks (only need standard bike racks)
b) the key boxes can be installed directly onto the bike racks, making the system accessible 24/7 (no power or internet is required for the key boxes)
c) the bikes are equipped with locks so users are free to ride and lock to standard bike racks at any desired location
d) management of the system is minimized due to the automated nature of the key boxes and low maintenance design of the bikes
e) most affordable way to implement an automated, managed bike share program.

The disadvantage of this approach is that a) it is more expensive than Ad Hoc and Bike Corral systems, b) users will need to pick up and return bikes to the same locations (although bikes can be locked anywhere until returned), c) each bike requires its own key box, and d) the system will require local management and monitoring.

Kiosk-Based Bicycle Sharing
This approach is most easily identifiable by its use of automated bike stations or kiosks that secure and electronically release the bikes. These kiosks are installed at designated locations around your facility or campus. Each type of kiosk has its own space and power requirements. Some kiosks can produce their own power using solar cells and battery packs. Others will require power, so site locations need to planned around availability of sun exposure or proximity to facilities.

The kiosks are designed to work with a specially designed bike that is 'docked' to the kiosk. Both the kiosk and the bike have electronics to ensure the proper interface between the bike and kiosk, and track usage, location and bike status. Each kiosk location has a defined number of 'docks' for bikes – ranging from 6-20. These 'docks' typically use very robust locking technology, and are not easily tampered with. The sites for the kiosks require facilities planning, as most of these systems need a 'density and proximity plan' to make sure the systems are placed in convenient locations that are relatively close to one another.

The electronics in these systems are proprietary and the functionality varies by system. But they do provide robust backend software to manage the overall bike share system including controlling access to the system, adding users, and monitoring system status, usage patterns and bike distribution. Kiosk based systems also typically can do everything right from the kiosk. They can register new users, accept various forms of payment (for fee-based systems), and verify authorization to use the system.

In this approach, registered users of the system walk up to a kiosk, and use their system ID card to electronically release one of the bikes from the kiosk. The rider can then take the bike and ride to another kiosk location where they return the bike by 'docking' it to the station. However, in order to return the bike, since the bikes can only be locked to a kiosk, an available 'dock' must be available at that kiosk location.

The advantage of Kiosk-based systems is a) the bikes are highly secure and available 24/7, b) the kiosk locations make the system very identifiable, and c) the backend software management makes locating bikes and tracking bike usage and operational condition easy.

The disadvantages of this system is a) these systems are expensive, both upfront for purchase/installation as well as ongoing operational support, b) since the bikes can only be locked to the kiosks, this system is not as flexible and convenient for users as the Ad Hoc and Automated Key Station approach, and c) the flow of the bikes needs to monitored and occasional redistribution of bikes may be needed to create capacity in certain locations.

Who Should Care About Bike Share?

On university and corporate campuses, there can be a number of champions to build support and demand for bike share:

Sustainability Teams and Managers
Bike share is a practical, sustainable program that benefits a wide percentage of people in a community. Bike share is non-polluting, and enhances the health and wellness of system users. It can also help promote a culture away from automobiles as well as raise awareness to other sustainability programs and green initiatives.

Transportation Managers
Bike share is an integral part of an overall transportation plan. Bike share provides a cost-effective alternative to busses and shuttles, and offers a flexible and green alternative to students, staff and employees for 'last-mile' transportation. It can be used to connect key destinations such as parking facilities or mass transit stops to central locations, or it can provide convenient ways for students to get on and off-campus. Bike share can also be accessible 24/7, unlike shuttle services.

Housing Managers
As campuses continue to expand, housing is moving farther away from the campus core. Students in these housing facilities can easily feel disconnected from the main campus. Although shuttle services can be used, shuttles run on a schedule that isn't always in-synch with student's needs. Bike share can help make a campus 'smaller' by connecting remote housing to campus.

Facilities Managers
Did you know you can fit 12 bikes in the same space as 1 car? Bike share can help a campus reduce its growing need for parking facilities and automobile infrastructure by offering a cost-effective alternative to bringing a car to campus. By reducing parking and promoting cycling, facilities managers can reduce both infrastructure and operating costs. Also, bike parking is inexpensive and unobtrusive.

Choosing the Right Partner

Once you have defined your system parameters, set your goals, and selected the right type of bike share system, you need to select the right solution provider.

There are many aspects to the implementation and on-going management of a bike share system. This includes logistical, financial and educational challenges. Here are a few:

1. Budget needs assessment and planning
2. Location analysis
2. System capacity planning
3. Bike specification needs assessment
4. Management planning and reporting
5. System training
6. Bike maintenance planning and resourcing
7. Rider incentive programs

Before you select a solution provider, make sure they have experience in various kinds of bike share systems, not just the one particular system that they offer. This will ensure they can provide you with credible guidance on how to configure, monitor and support the system.

Build It and They Will Come?

Implementing a successful bike share program goes beyond the initial launch. In order to attain usage goals, long-formed habits and routines must be changed. Education of the targeted user group is essential, and incentive/reward programs should also be considered.

These incentives/rewards can come in many forms and be a very effective motivator to jump start a program and help change long-formed habits. In some systems, users are paid NOT to drive their cars. In others, they receive reductions in health care premiums, or rewards (such as points/merchandise) No one program fits all. You can consider prizes based on random drawings of all users of the system; or run competitions with individuals or teams based on usage and goals. ∎

Bike Share System Comparison Table			
	Description	**Advantages**	**Disadvantages**
Ad Hoc	Bikes are distributed around the facility or campus. Bikes are typically painted or marked to indicate that they are for shared use. Bikes are not locked, and anyone is free to use the bikes.	a) Low cost – it is the least expensive way to implement a shared bike system as there are no technology or support costs b) Can use any available bikes	a) There is no accountability for users of the bikes b) Bikes are never in predictable locations since they can be left anywhere c) Bikes are easily stolen and vandalized d) liability exposure and safety concerns
Bike Corral	Bikes are kept in a central location and equipped with locks. The keys for the locks are managed by a person at a centralized location. Bikes are checked-in and checked-out at the central location.	a) Low cost of start-up b) Can use any available bikes b) Centralized management and control	a) Reliance on dedicated resources to staff a central location for bike check in/out b) Limited convenience because bikes have to be picked up and returned to a centralized location during operating hours
Automated Key Boxes	Uses electronic key boxes that secure bicycle keys and log bike usage.	a) Bikes don't require specially designed bike stations or kiosks b) Key boxes can be installed into directly onto the bike racks with the bikes c) Convenient - bikes are equipped with integrated U-locks so users can lock bike to any bike rack e) most affordable way to automate/manage a bike fleet	a) More expensive than Ad Hoc and Bike Corral systems b) Users need to pick up and return bikes at specific locations c) Each bike requires its own key box d) requires local management and monitoring
Kiosk-Based	Uses bike stations or kiosks installed at designated locations around your facility or campus that secure and electronically release the bikes.	a) Bikes are highly secure and available 24/7 b) Kiosk locations make the system very identifiable c) Backend software management can locate bikes and track bike usage and operational condition	a) Most Expensive – both upfront as well as ongoing operational support b) Less flexibility – bikes can only be locked to the kiosks, so less convenient for users c) Requires specially designed bikes

This white paper was provided courtesy of On Bike Share.
For more information, contact On Bike Share at 401-254-6111, or by email at info@onbikeshare.com.