



# Docked or Dockless: Which Bike Share System is Right For You?

## *A Comparative Guide*

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### Introduction

*As bike share grows in popularity, technology is making it easier and more affordable to operate smaller, 'privately-operated' bike share programs.*

*If you are looking at setting up your own bike share program for your commercial or residential property, college, corporate campus or hotel/resort, you have multiple ways to deploy a system based on your goals, your audience, and your budget.*

*This paper will compare the two most common deployment types – Docked and Dockless – and highlight the advantages and disadvantages of each method.*

### Overview

*Bike Share systems come in many forms. But they all have the same goal – providing as many people with access to bicycles as conveniently and as reliably as possible. But no one system is right for all. This is why bike share suppliers have come up with different approaches to accomplishing this – using different technology and deployment strategies to best meet your needs.*

*This white paper compares deployment strategies as they relate to privately operated bike share programs on corporate/university campuses, and residential/commercial properties.*

## Docked (Station-Based)

Docked (Station-Based) systems use dedicated racks to secure bikes in specific locations. The racks used on these systems typically do not require power, but may have requirements for access to sunlight and/or size requirements for racks spacing and setbacks from walls, curbs, etc.

Docked systems have two deployment types:

- Point-to-Point (or A-to-B)
- Ride-and-Return (or A-to-A)

### Point-to-Point

Point-to-Point is a station-based system that allows riders to checkout and return bikes to any available station in the system.

This deployment type is common in larger bike share programs with multiple bike stations, where bikes do not have supplemental locks, and riders have a propensity for one-way trips.



If you have used a municipal bike share system, you have used a Point-to-Point system. You pick up a bike at one bike station and leave at another. These systems provide maximum flexibility to riders where the majority of rides are one-way trips. However, if you have ever showed up to a bike station to use a bike only to find it empty, then you also understand the downside of Point-to-Point systems – bikes aren't always where you need them when you need them. This means if you leave a bike at a station, you run the risk of the bike not being there when you come back.

With Point-to-Point systems, the theory is that if bikes are used primarily for one-way trips, by returning bikes to a station rather than temporarily securing the bike reduces idle time of the bikes, increases availability, and increases overall system utilization. This is the hallmark of municipal programs where bike share is an extension of the

transit system, designed for last-mile and short-range trips that are better served by bike than by bus or train.

Point-to-Point systems require riders to return bikes to stations when done using the bikes, so stations need to be placed with enough density and with enough available docking spots such that riders have a convenient place to leave the bike. If bike stations aren't near their destination, or there are no available docking spots when the rider arrives, then the rider has no way to lock the bike.

For this reason, Point-to-Point systems need to build 'excess capacity' into the system, i.e. more docking stations than they have bikes. This number can vary from 50% - 100% excess capacity. That's as many as two stations for every bike. Which is one of the biggest disadvantages of owning and operating a Point-to-Point system – they are more expensive to deploy.

Another downside to operating a Point-to-Point system is that bike travel is not always reciprocal. In other words, if bikes move more in one direction than others (i.e. everyone rides downhill, but no one rides uphill), bikes tend to congregate at certain stations. This means bikes need to periodically re-balanced (redistributed) across the stations. This requires time and resources. If you are managing a system yourself, you need to determine your operational means for doing this.

### Ride-and-Return

Ride-and-Return (or round-trip) is a station-based system that requires riders to return bicycles to the same station that they checked it out from.

This deployment type is common in systems with one location, and in systems where the majority of rides are round-trip. Success of this type of system relies on bikes having a secondary lock for riders to lock bikes temporarily.



Ride-and-Return systems tend to get deployed in environments where the bike share is for round-trip rides to/from a specific location. For example, if the bikes are positioned outside an office building, residential building or dormitory, Ride-and-Return makes sense because the users of the bikes are eventually going to need to return to the same location they took the bike from.

Ride-and-Return programs offer advantages for smaller deployments. First, if riders are required to return the bikes to the same place that they checked it out, then bikes are always going to end up back where they started so the bikes are balanced across the system. In other words, no operational time or resources are needed to re-balance the bikes.

Second, Ride-and-Return systems also tend to be less expensive to deploy because you have the same number of docking spots/racks as you do bikes, so the equipment costs are lower than Point-to-Point systems (which require additional racks).

And finally, with most Ride-and-Return systems, when someone has the bike, these bikes provide supplemental locks that allow riders to lock it temporarily while they shop, dine or attend meetings/classes. This means the bike will always be there when they come back, so they won't get stranded without a ride.

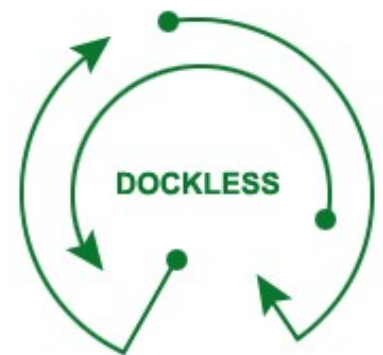
However, this type of system is not for everyone. Ride-and-Return systems are most practical for smaller scale systems, where riders can be relied on to return bikes back to where they started. Because of this, Ride-and-Return provides less flexibility to riders because riders are responsible for returning bike back to starting point, which may not always be practical.

## Dockless

A Dockless bike share system does not use dedicated racks or bike stations. With Dockless systems, the locking mechanism is attached to the bicycle, so riders can lock and leave the bike wherever is convenient to the rider. This allows bikes to roam freely in a geographic area without requiring riders to return to any particular location.

Dockless systems have recently become very popular in cities due to their lower startup costs (no need to install bike stations), low rental rates for riders, and little to no tax subsidies. Several Dockless systems are available, and all use nearly identical locking technology consisting of a 'ring' style lock built over the rear wheel. When engaged, the ring closes, preventing the rear wheel from spinning.

However, the bike is only locked to itself; it is not attached to anything. So with dockless systems, even when the bike is locked, the bike can be moved, knocked over or tampered with.



One of the primary advantages of a dockless system is that it offers riders maximum flexibility to stop and lock the bike as close as possible to their final destination. They are not required to find a nearby bike station to lock the bike to. In addition, dockless bike share systems use GPS technology to track bikes, so riders can find available bikes nearby through the App on their phone.

One of the downsides to dockless systems is that if bikes can be left anywhere, they will be left *anywhere*. This means bikes aren't always in predictable locations, and often times they are in locations that aren't convenient to the majority of the participants in the program. And unfortunately, dockless systems have also suffered from considerable mischief and community backlash due to bikes being left blocking doorways and sidewalks, hung in trees, found at the bottom of the rivers, or left on private property.

## Summary

As 'privately operated' bike share continues to grow in popularity, it is important to focus first on how you want to deploy your system to best serve your audience, what level of convenience you want to provide your riders, and the resources you have to manage the system. ■

Deployment Type	Advantages	Disadvantages
Point-to-Point	<ol style="list-style-type: none"> <li>1. Convenience of picking up and leaving bikes at any available station</li> <li>2. Ideal for one-way trips</li> <li>3. Bikes are stored in orderly racks</li> </ol>	<ol style="list-style-type: none"> <li>1. More expensive to deploy than Dockless (need racks, installation, etc)</li> <li>2. Bikes need to be periodically re-balanced across stations</li> <li>3. Riders not guaranteed bikes will be available at every station</li> </ol>
Ride-and-Return	<ol style="list-style-type: none"> <li>1. No operational time or resources are needed to re-balance the bikes</li> <li>2. Less expensive to deploy than Point-to-Point</li> <li>3. Riders won't get stranded without a ride</li> </ol>	<ol style="list-style-type: none"> <li>1. More expensive than Dockless (need racks, installation, etc)</li> <li>2. Most practical for smaller scale systems</li> <li>3. Requires riders to return bikes to original checkout location</li> </ol>
Dockless	<ol style="list-style-type: none"> <li>1. Faster to deploy (no racks or installation)</li> <li>2. Enables riders to stop and lock the bike as close as possible to their final destination</li> <li>3. Bikes can be located through App using GPS</li> </ol>	<ol style="list-style-type: none"> <li>1. Bikes aren't always in convenient or predictable locations</li> <li>2. Bikes being left in malicious or inconsiderate locations</li> <li>3. Bikes susceptible to theft or tampering since not secured to anything</li> </ol>