

# School Bike Parking Guide

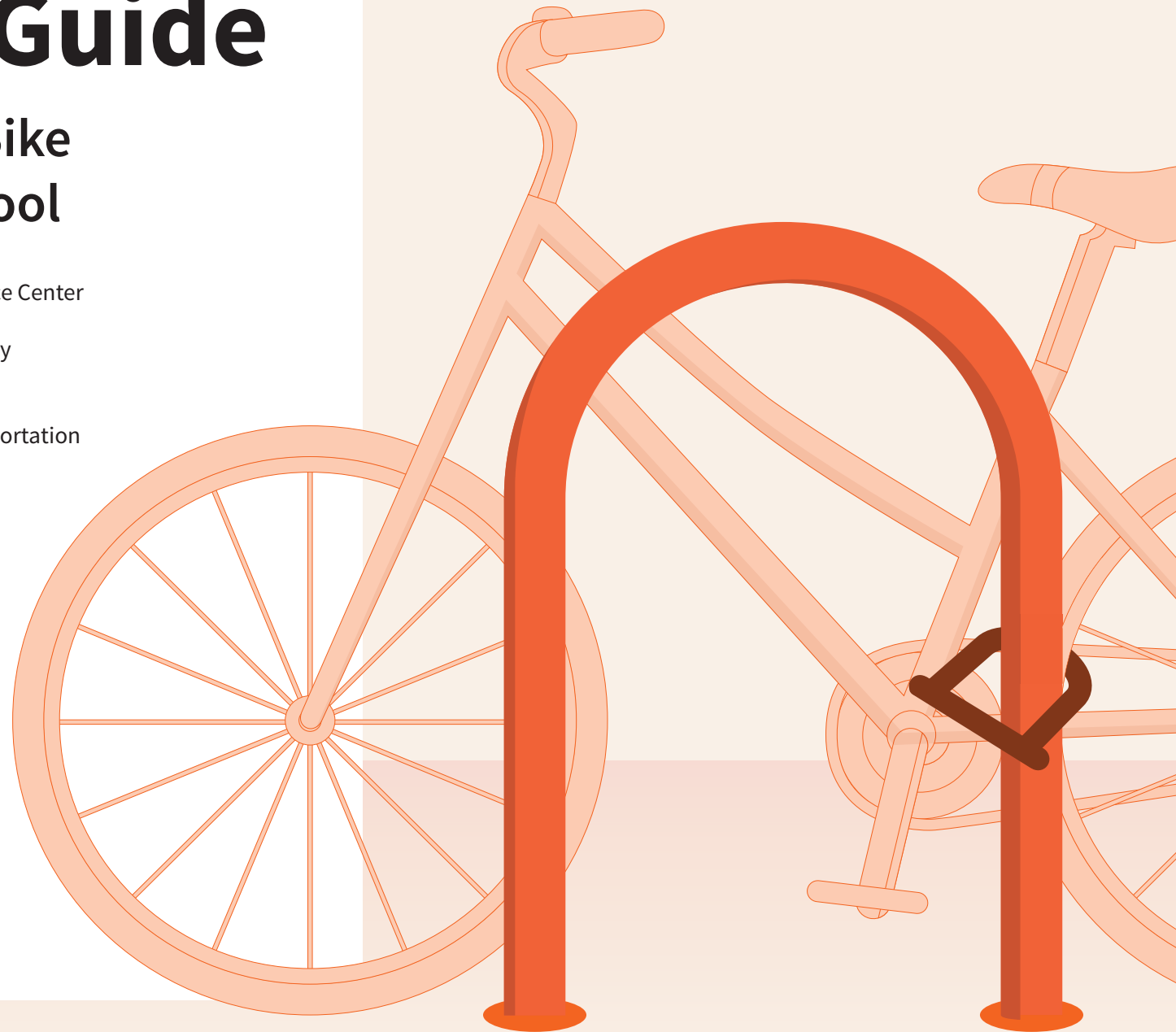
## Finding the Best Bike Rack for your School

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## Introduction

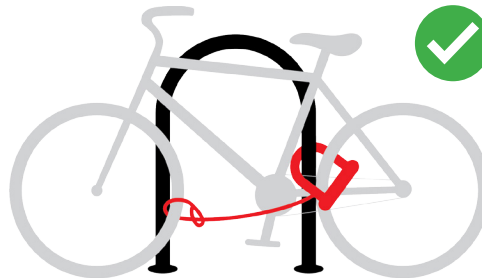
School bicycle parking, particularly for elementary and middle-school students, requires additional considerations than for bike parking in other environments. Universally, bike parking should be secure, sheltered, easy to use, and have adequate capacity, but factors such as school location and riders' ages are important when determining the most appropriate type of bike rack. With younger students, for example, ease-of-use is especially crucial, while schools where large numbers of students arrive by bike may need to select high-capacity racks.

As increasing numbers of students bike to school, it is important that schools provide parking facilities that satisfy their students' specific needs. This guide provides information to help schools make appropriate decisions when purchasing and installing racks. A brief introduction on how to properly lock a bike is followed by descriptions of bike rack choices, the pros and cons of the most popular types of bike racks, and a look at features student riders want in their school's bike parking.

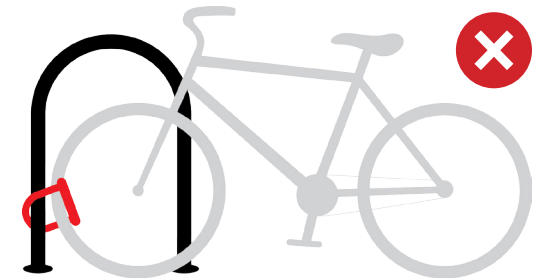
## How to Lock a Bike Properly

When used properly, the U-Lock provides superior security over other lock types. A U-Lock should secure both the bicycle frame and one of the two wheels; an effective technique is to secure the rear wheel rim to a rack, with the lock threaded through the rear triangle of the bicycle frame. Aside from ensuring that both the rear wheel and the frame are secure (because a thief would need to destroy the rear wheel in order to remove the frame), this method is relatively easy for children to use.

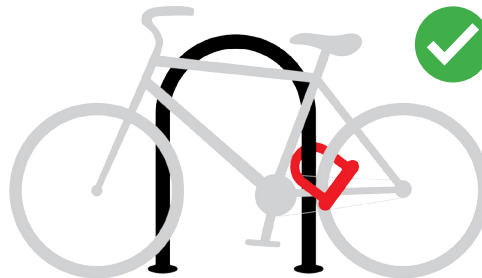
While U-Locks are a secure option, they are heavier, more expensive, and more complicated for children to use than other types of locks. Cable locks are a popular alternative. A particular appeal for children is that cable locks are often equipped with a combination locking mechanism, thus eliminating the need to remember a key. As with U-Locks, cable locks should be threaded through the bicycle frame, one of the wheels, and the bike rack. Riders should use care on crowded racks to ensure they do not lock their bike to another bike. Although many cable locks can be cut using the right tools, they may be an adequate choice when used in more secure locations, especially given that children's bikes are less expensive and thus less theft-prone.



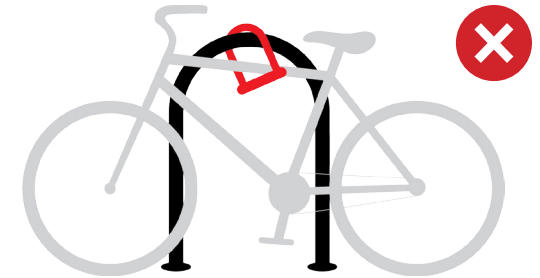
U-Lock secures rear wheel and frame, with additional cable to secure front wheel.



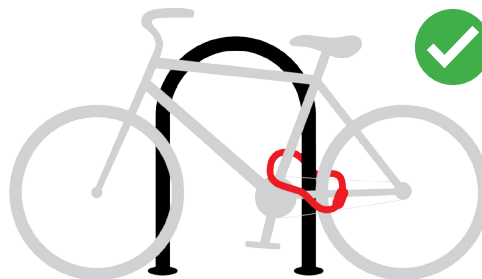
U-Lock secures front wheel only, leaving rest of bicycle vulnerable to theft.



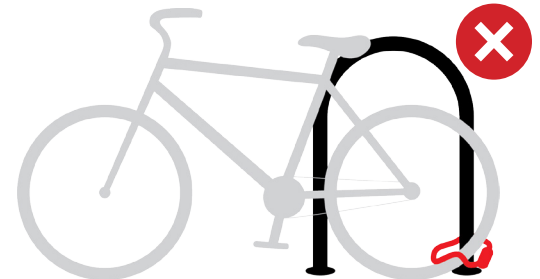
U-Lock secures rear wheel and frame.



U-Lock secures bicycle frame only, leaving both wheels vulnerable to theft.



Cable lock secures rear wheel and frame.



Cable lock secures rear wheel only, leaving rest of bicycle vulnerable to theft.



# Important Features for Students Biking to School

## Ease of use

School bicycle parking must be easy for students to use, particularly for schools that serve young children. Simple and intuitive bike racks reduce the risk of improper locking behavior, which can increase the risk of damage or theft, or may reduce usable rack capacity. Small children may have difficulty with racks that require them to lift their bicycles. While instruction and signage can help students understand proper use of the bicycle racks, some rack designs are inherently easier to use than others.

In addition to choosing an appropriate rack design, it is important that the racks are sited properly to maintain ease of use. Figure 1 shows a Wave Rack that has been placed too close to a building wall, while Figure 2 shows an Inverted U-Rack located too close to a curb. In both instances, capacity and usability are hindered by poor placement.



Figure 1: Bike rack placed too close to building wall  
source: sportworks.com



Figure 2: Bike racks placed too close to curb.  
source: birmingham.ac.uk

## Security

Security must be a high priority for bicycle storage. While U-Locks can provide a high level of protection, their effectiveness may be negated by improper locking techniques. Cable locks are more affordable, but are vulnerable to cutting. Even well-locked bicycles may be subject to tampering or other mischief. As schools typically do not accept liability for damage or theft incidents, parents must feel confident that their child's bicycle will be secure during the school day.



Figure 3: Bike rack in a high-visibility area at Buzz Aldrin Middle School in Montclair, NJ  
source: NJ Safe Routes to School Resource Center

Bicycle parking should be placed in a high visibility area (Figure 3). For example, racks may be placed near the school's front door, by the Principal's office window, or in clear view of a security camera. Areas of high foot traffic also provide a deterrent to would-be thieves.

## Capacity

School bike racks must be sufficiently large or numerous to accommodate the bicycles of all students, teachers, and administrators who wish to ride to school. Racks that are perpetually full may dissuade potential riders from cycling to school.

To ensure maximum capacity, each style of bicycle rack has recommended clearances between the rack and other fixed objects. The Association of Pedestrian and Bicycle Professionals recommends a minimum of 2ft x 6ft of space per bicycle. Schools should adhere to these clearances when installing racks, as they ensure easy access to spaces while avoiding overcrowding and bike-to-bike contact.



Figure 4: Covered bike parking in Egg Harbor City, NJ  
source: Cross County Connections TMA

## Shelter

Sheltered bicycle parking is preferred whenever feasible. Cage-style shelters (Figure 5), are optimal for schools, as administrators can lock the cage during the school day. This arrangement provides secure, weather-protected storage for bikes without the need for individual locks, thus avoiding the need for students to keep track of lock codes or keys.



Figure 5: Cage-style bike shelter.  
source: cyclerracks.co

Cages can also provide security for helmets, skateboards, and other items that cannot easily be locked. Finally, cages offer increased siting flexibility, as the added security means that they do not necessarily need to be in high-visibility locations.

Other sheltered parking may not provide the security advantages of a cage, but do add protection from the elements (Figure 4).

## Additional Considerations

Schools should take helmet storage into consideration when adding bicycle parking facilities. If student lockers are not large enough to accommodate helmets, a school may consider offering space within the main office. Aside from offering a safe and convenient storage option, this also allows schools to monitor their students' helmet usage.

Skateboard parking accommodations are an additional means of encouraging active travel to school. Some schools will allow riders to keep their skateboards in the central office or in a locked bicycle cage. Alternatively, some companies offer specialized skateboard storage racks (Figure 6).

Finally, parents can register bikes through a national or local database, offering an increased possibility of recovery in the event of theft.



Figure 6: Skateboard storage racks  
source: groundcontrolsystems

# Bicycle Racks

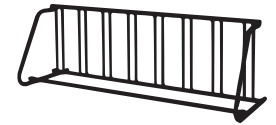
Bicycle racks should be secure, easy to use, and provide adequate capacity, but some rack designs satisfy these requirements better than others. This guide provides a balanced assessment of different designs, while accounting for other considerations such as price and mobility.

A “touch point” is a spot on the bike that touches the rack. Two touch points provide better stability than one, reducing the likelihood that the bike will fall over and damage itself and/or other bikes. The number of touch points depends on the design of the rack.

In the following descriptions, reference is made to guidelines established by the Association of Pedestrian and Bicycle Professionals. More information can be found on their website at [www.apbp.org](http://www.apbp.org).

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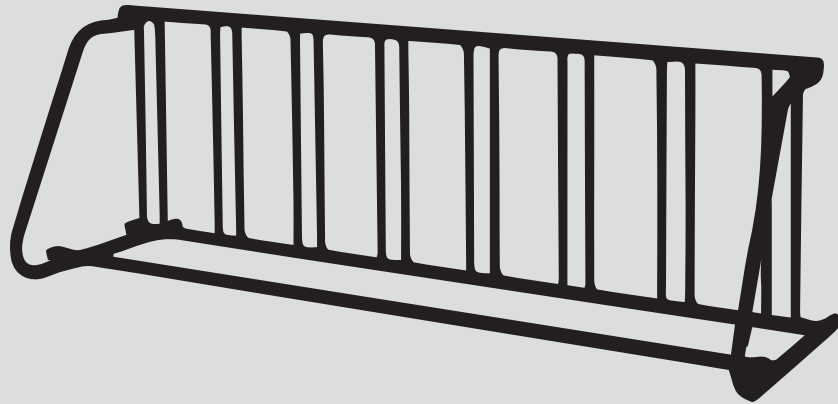


## The Plaza Rack

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## The Grid Rack

The Grid Rack is a common favorite because of its low cost; however is not recommended due to its many disadvantages. Frequent problems arise from improper placement and/or usage. Although bikes should be alternated on either side of the rack to maximize capacity and minimize damage risk (see Figure 7), cyclists can only access one side of grid racks that are placed in corners or against walls (Figure 8). Additionally, many racks have slots that are too small for some bike wheels.

Security of grid racks is sub-standard, as they are incompatible with U-Locks, and some designs may be easily disassembled or cut using the right tools.

Bike wheels should be secured within the “skinny” slot on a grid rack; the wider slots are intended to be left empty as they do not stabilize the wheel and can result in overcrowding when used. Physical barriers may be installed in the wide slots to ensure that children use the racks properly.

### Pros

- Easy to Use
- Portable
- Inexpensive
- Wheel well increases stability (when used properly)

### Cons

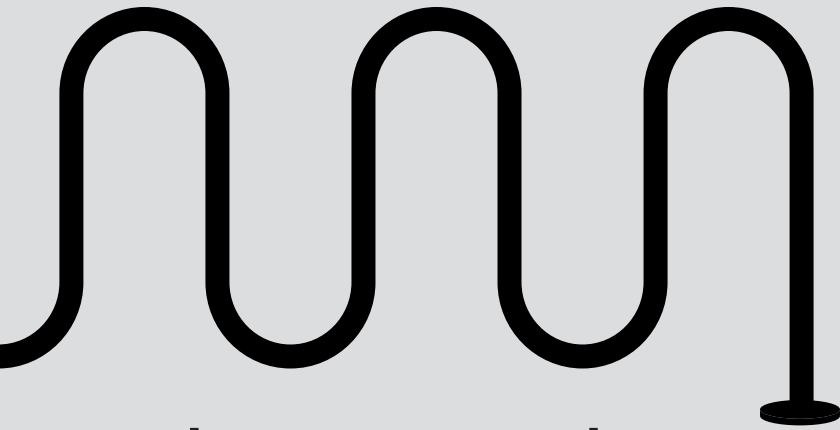
- Frequently used incorrectly, which may induce wheel damage
- Frequently sited incorrectly
- Bicycles may be parked too densely
- Incompatible with U-Locks
- Does not meet APBP guidelines



Figure 7: One-sided grid rack  
source: [globalindustrial.com](http://globalindustrial.com)



Figure 8: Grid racks used incorrectly  
source: [Flickr user Steven Vance \(flic.kr/p/e2vJ6u\)](https://www.flickr.com/photos/stevenvance/)



## The Wave Rack

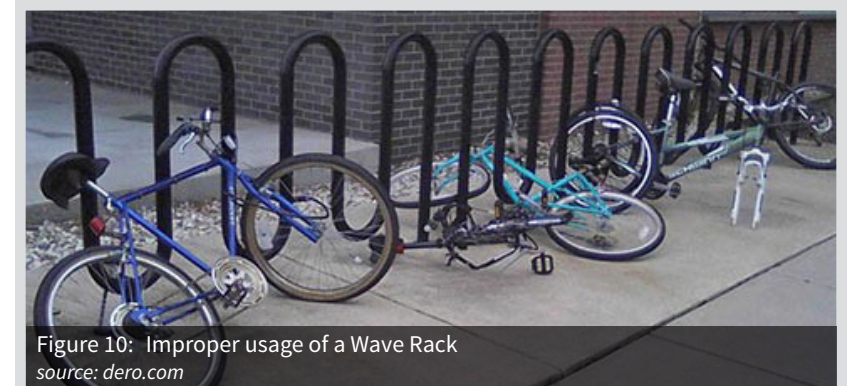
### Pros

- Attractive
- Portable option
- Inexpensive

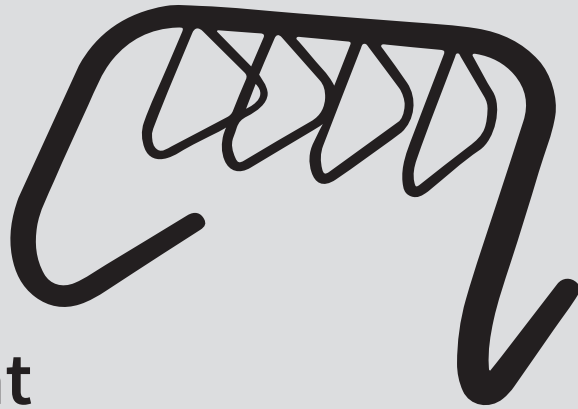
### Cons

- Moderate ease-of-use
- Frequently used incorrectly
- Frequently sited incorrectly
- One touch point
- Inefficient use of space
- Does not meet APBP guidelines

The Wave Rack is appealing for its relatively low cost and attractive design. Though they are typically secured to the ground, they are also available in portable versions. Proper parking technique is to secure bikes either to the ends or within the “U” sections of the rack (Figure 9). Bikes do not need to alternate direction, although doing so reduces the likelihood of handlebar interference. Wave Racks may become cluttered when users park their bikes through the “inverted U” portion, while other users may limit overall capacity by securing their bikes parallel to the rack (Figure 10). This rack also requires riders to lift their bikes to get the wheel and handlebar through the “U” portion, a task which may be difficult for children.







## The Coat Hanger Rack

### Pros

- Attractive
- Two touch points
- Portable option
- Relatively inexpensive
- Meets APBP guidelines

### Cons

- Bikes may be parked too close together
- Some versions do not accommodate all bike sizes
- Top bar may limit usability with some bikes

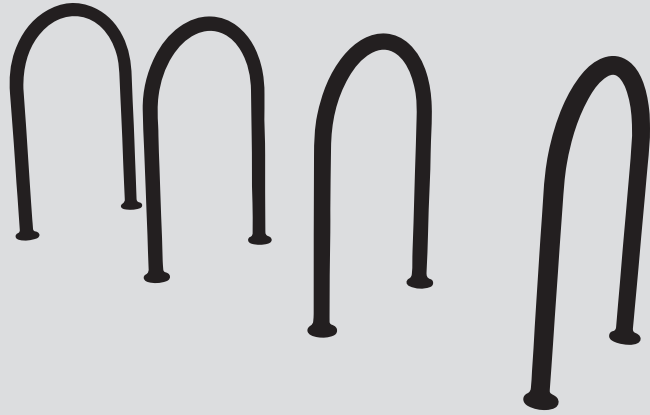
Capacity of Coat-Hanger Racks may be maximized when both sides are accessible and users can alternate their bikes on either side of the rack. Depending on the size of the “coat-hanger,” larger or smaller bikes may not fit. An alternative is the Modified Coat-Hanger Rack, where the hanger is shaped to accommodate a greater range of bike sizes.



Figure 11: Coat hanger rack used properly  
source: wabikes.org



Figure 12: Modified coat hanger rack used properly  
source: ameribike.com



## The Inverted U-Rack

The Inverted U-Rack, or “Hoop” rack, has become increasingly popular because of its relative ease of use, moderate cost, and ample security. Each hoop can accommodate up to two bikes and may be spaced to avoid crowding and bike damage from user error (Figure 13). In-ground installations are more secure, but portable versions provide additional placement flexibility.



Figure 13: Proper usage of an Inverted U-Rack  
source: [lareykerling.files.wordpress.com/](http://lareykerling.files.wordpress.com/)

### Pros

- Attractive
- Easy to use
- Two touch points
- Portable option
- Flexibility of placement
- Relatively inexpensive
- Meets APBP guidelines

### Cons

- In-ground installation requires additional capital expense
- Round-tubed versions may be vulnerable to cutting (designs with horizontal bars may be more secure)

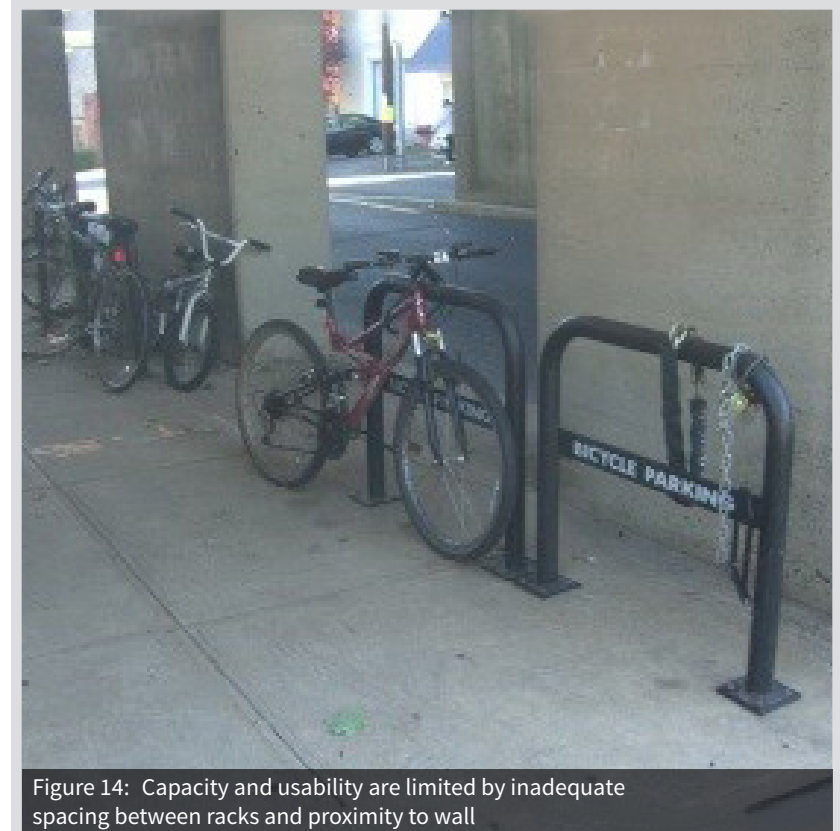


Figure 14: Capacity and usability are limited by inadequate spacing between racks and proximity to wall





## The Wheelwell Dock Rack

The Wheelwell Dock Rack provides several advantages to the Inverted U-Rack. It is a space-efficient design, and the wheel cradle makes usage intuitive. Placement may be staggered to increase parking density. This type of rack is expensive to purchase and cannot be moved easily.

### Pros

- Some designs cradle the wheel for additional stability
- Easy to use
- Two touch points
- High capacity
- Meets APBP guidelines

### Cons

- May not accommodate all bike sizes
- Not portable
- Prices vary, but can be more expensive







## The Artistic/ Creative Rack

Artistic bike racks may provide a creative opportunity with community participation; the product can be a unique design with local branding. However, the non-standard designs are sometimes subject to the limitations of “form over function” (see Figure 17 and Figure 18).



Figure 17: Octopus-shaped creative rack in Seattle  
source: Flickr user Ken Lane ([flic.kr/p/AG1Bzc](https://www.flickr.com/photos/kenlane/AG1Bzc/))

### Pros

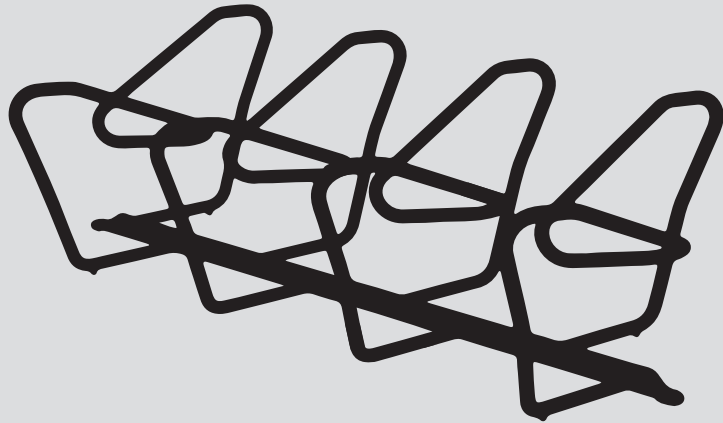
- Attractive
- May provide branding opportunities
- Possibility of community design input

### Cons

- May not have two touch points
- May not accommodate all bicycle types
- May be expensive



Figure 18: Capacity may be limited at this artistic rack  
source: [makeitarttalk.blogspot.com](http://makeitarttalk.blogspot.com)



## The Plaza Rack

The Plaza Bike Rack is a well-rounded design with numerous advantages. It combines security, ease of use, portability, and capacity all in one package.

### Pros

- Easy to use
- Two touch points
- Design provides stability
- Portable option
- High-density
- Meets APBP guidelines

### Cons

- Can be expensive



Figure 19: Single-sided Plaza rack  
source: sportworks.com



Figure 20: Double-sided Plaza rack  
source: climatecolab.org



# The Best Bicycle Rack for Your School Environment

The ideal location for any bicycle rack is in a high visibility area. This will likely be by the front door, the bus dock area, outside the main office, outside the principal's office window, or any other high traffic area. Some schools take issue with the aesthetic of bike racks in a high visibility area while some may just simply not have the space to spare to provide bike parking in a high visibility area.

The best bicycle parking for any school is the use of cages. The security and shelter of these enclosures enable virtually any rack and any lock to be used within the cage, and the cage can be placed in a more remote space because theft is not an issue. However, because a cage is not feasible for all schools there are many other adequate solutions.

## If Security is a Priority

If security is prioritized over space, whether in a high visibility area or not, the in-ground Inverted U-Racks and the Modified Coat-Hanger Racks are preferred. These racks allow the wheel and frame to be locked while still maintaining ease of use, and relatively dense parking. These racks have two touch points which provide increased stability to the bicycles. In contrast, the Grid Rack does not lend itself to the ability to be locked at the frame and wheel with a U-lock nor does it have two touch points.

## If Ease of Use is a Priority

Ease of use is a subjective term; however, usability is crucial when the riders are young children. Through instruction, the Grid Rack can be easily used, although the alternating sides

of some Grid Racks may confuse some users. The Inverted U-Rack is likely the easiest to use because users can intuitively recognize the appropriate place to park one's bike.

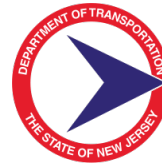
## If Capacity is a Priority

For a high visibility area, where more bike parking capacity is needed, the Grid Rack could be the rack of choice. This rack can be successfully utilized if there is sufficient space on both sides, if the rack is tall enough to fit all bike wheel sizes, and if students are cognizant of how to use it effectively (see the Grid Rack section). Cable locks, a child's preferred lock, can be easily used with the Grid Rack. Grid racks can also be used inside a cage system.

## Conclusion

Bicycling to and from school provides a number of benefits to children as well as the environment, including healthier and happier students, less roadway congestion, and cleaner air. By providing adequate parking for bicycles at schools, children and their parents will be more likely to encourage bicycling to and from school. For more information on bicycling facilities, model policies for bicycling to school, and how to address Safe Routes to School in your community, contact the New Jersey Safe Routes to School Resource Center at [srts@ejb.rutgers.edu](mailto:srts@ejb.rutgers.edu), or visit [saferoutesnj.org](http://saferoutesnj.org).





For more information, contact the New Jersey  
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