



October 2013

Regional Bike Parking Study

Bicycle Parking Installation Guidelines

The Bicycle Parking Installation Guidelines is Appendix G from the Regional Bike Parking Study, pages 86 - 97



Appendix G: Bicycle Parking Installation Guidelines

The following installation guide was prepared for use by any agency or entity that will be responsible for physically installing and maintaining bicycle parking facilities. It includes guidance for spacing between bicycle parking and other elements, information about materials and maintenance, and a cost range for recommended bicycle parking types.

Bicycle Lockers

Description

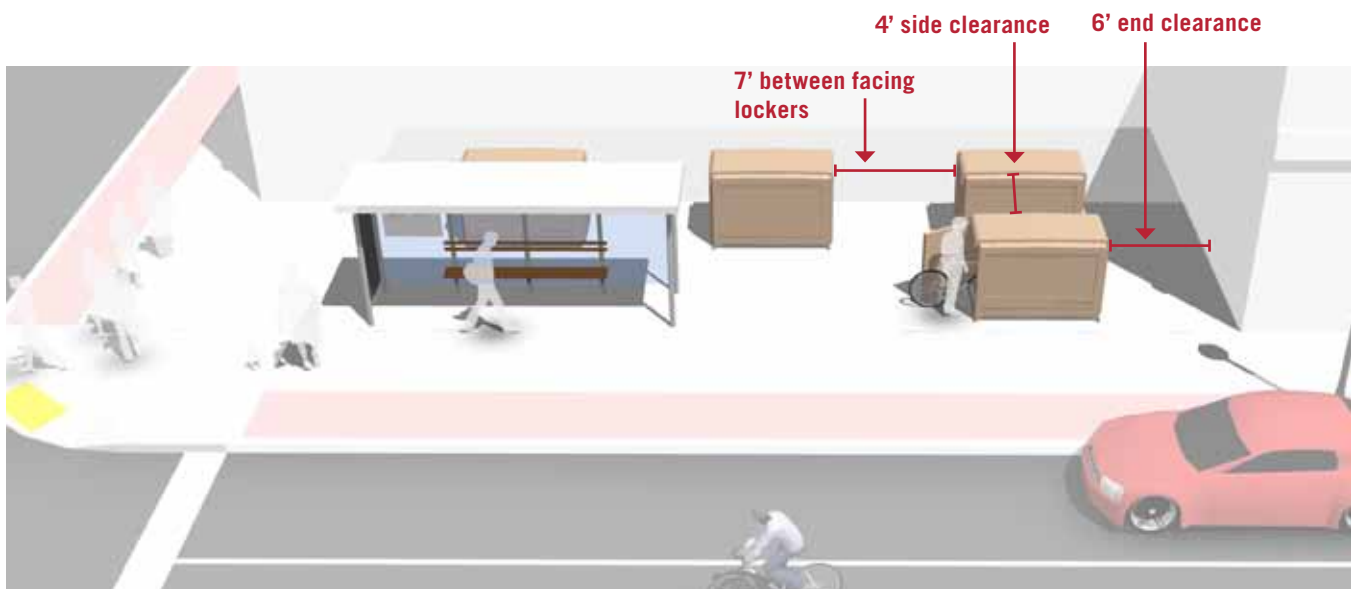
Bicycle lockers are intended to provide long-term bicycle storage for employees, students, residents, commuters, and others expected to park more than two hours. Long-term facilities protect the entire bicycle, its components, and accessories against theft and against inclement weather, including snow and wind-driven rain.

Bicycle lockers provide space to store a few accessories or rain gear in addition to containing the bicycle. Some lockers allow access to two users - a partition separating the two bicycles can help users feel their bike is secure. Lockers can also be stacked, reducing the footprint of the area, although that makes them more difficult to use.

Lockers may create potential hazards in public spaces if they are used to hide explosive devices or other objects harmful to the public. Many manufacturers have designed features to mitigate this threat by providing perforated sidewalls or windows that allow passersby to visually inspect the contents of a locker.

Guidance

- Minimum dimensions: width (opening) 2.5 feet; height 4 feet; depth 6 feet.
- 4 foot side clearance and 6 foot end clearance.
- 7 foot minimum distance between facing lockers.
- Locker designs that allow visibility and inspection of contents are recommended for increased security.
- Access for older systems was controlled by a key, while newer systems use a keycard or access code to provide security.



Discussion

Long-term parking facilities are more expensive to provide than short-term facilities, but are also significantly more secure. Although many bicycle commuters would be willing to pay a nominal fee to guarantee the safety of their bicycle, long-term bicycle parking should be free wherever automobile parking is free. Potential locations for long-term bicycle parking include transit stations, large employers, and institutions where people use their bikes for commuting and not consistently throughout the day.

Materials and Maintenance

Regularly inspect the functioning of moving parts and enclosures. Change keys and access codes periodically to prevent access to unapproved users.

Cost Range:

\$1,500 to \$3,500 per bike

Secure Parking Area (SPA)

Description

A Secure Parking Area for bicycles, also known as a BikeSPA or Bike & Ride (when located at transit stations), is a semi-enclosed space that offers a higher level of security than ordinary bike racks. Accessible to registered members via key-card, combination locks, or keys, BikeSPAs provide high-capacity parking for 10 to 100 or more bicycles. Increased security measures create an additional transportation option for those whose biggest concern is theft and vulnerability.

Guidance

Key features may include:

- Secure access for users with closed-circuit television monitoring.
- Double-decker racks & cargo bike spaces.
- Bike repair station with bench, pump, and tools.
- Bike tube and maintenance item vending machine.
- Bike lock hitching post – allows people to leave bike locks at the SPA.
- Lockers for users to securely store belongings.
- Electrical outlet for charging e-bikes.

Double-decker racks help take advantage of the vertical space, further maximizing the parking capacity.



In the space formerly used for seven cars, a BikeSPA can comfortably park 80 bikes with room for future expansion.

Discussion

BikeSPAs are ideal for transit centers, airports, train stations, employment centers, or wherever large numbers of people might arrive by bicycle and need a safe place to park. A BikeSPA allows people to leave without worrying if their bike will be stolen or vandalized while they are away for an extended period of time.

Materials and Maintenance

Regularly inspect the functioning of moving parts. Hose down racks and floor to remove road grime left by parked bikes. Change keys and access codes periodically to prevent access by unapproved users.

See **Two-Tier Racks** and **Staple Racks** for Layout Dimensions.

Cost Range:

\$1,200 to \$5,000 per bike

On-Street Bicycle Corral

Description

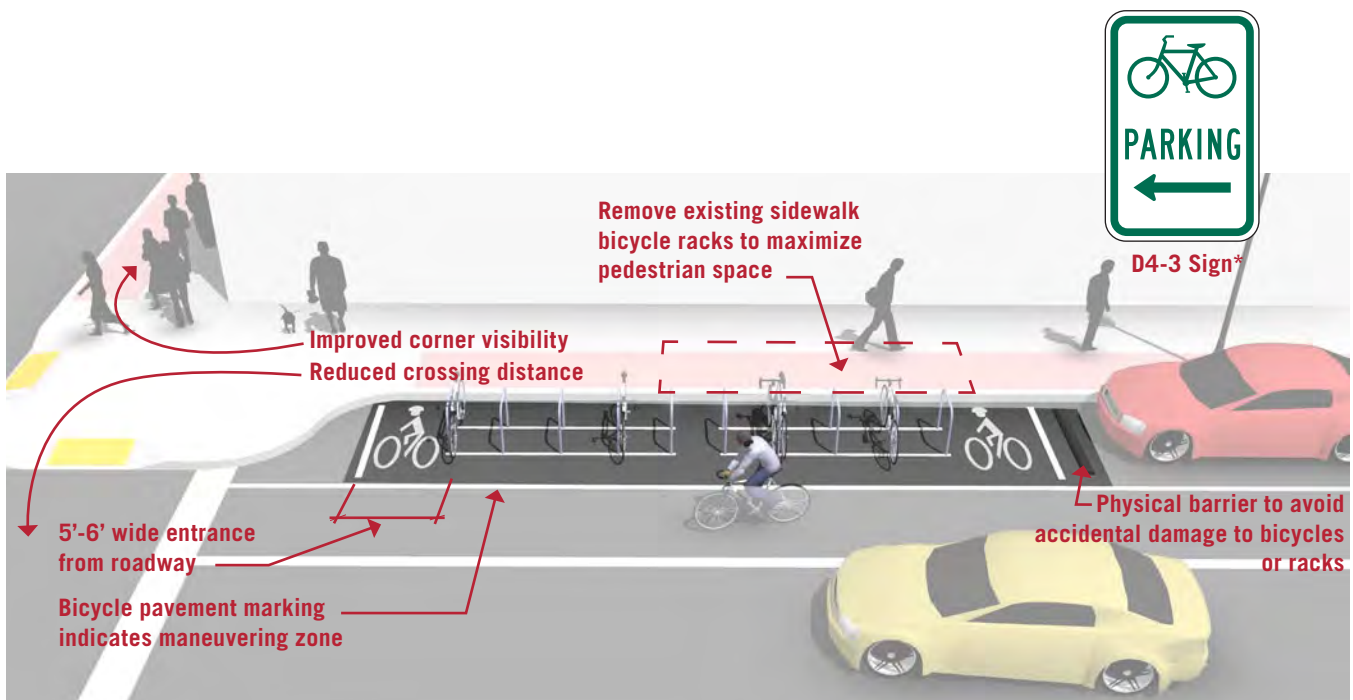
Bicycle corrals (also known as on-street bicycle parking) consist of bicycle racks grouped together in a common area within the street traditionally used for automobile parking. Bicycle corrals are reserved exclusively for bicycle parking and provide a relatively inexpensive solution to providing high-volume bicycle parking. Bicycle corrals can be implemented by converting one or two on-street motor vehicle parking spaces into on-street bicycle parking. Each motor vehicle parking space can be replaced with approximately ten to twelve bicycle parking spaces.

Bicycle corrals move bicycles off the sidewalks, leaving more space for pedestrians, sidewalk café tables, etc. Because bicycle parking does not block sightlines (as large motor vehicles would do), it may be possible to locate bicycle parking in no-parking zones near intersections and crosswalks.

Guidance

See guidelines for sidewalk **Bicycle Rack Placement** and clear zones.

- Bicyclists should have an entrance width from the roadway of 5 to 6 feet.
- Can be used with parallel or angled bike racks.
- Physical barriers should be installed a minimum of 6 inches from curb to allow drainage and reduce collection of debris.
- Parking stalls adjacent to curb extensions are good candidates for bicycle corrals since the curb extension provides a physical barrier to protect parked bicycles.
- For signs, either the MUTCD D4-3 sign (shown below) or the LTD custom sign (see Appendix B) may be used.



*As defined in the Manual of Uniform Traffic Control Devices, section 9B.23 (<http://mutcd.fhwa.dot.gov>)

Discussion

In many communities, the installation of bicycle corrals is driven by requests from adjacent businesses, and is not a city-driven initiative. In such cases, the city does not remove motor vehicle parking unless it is explicitly requested. In other areas, the city provides the facility, and business associations take responsibility for the maintenance of the facility. Communities can establish maintenance agreements with the requesting business. Bicycle corrals can be especially effective in areas with high bicycle parking demand or along street frontages with narrow sidewalks where parked bicycles would be detrimental to the pedestrian environment.

Materials and Maintenance

Consider establishing a maintenance agreement with neighboring businesses. In snowy climates the bicycle corral may need to be removed during the winter months.

Cost Range:

\$1,500 - \$3,500 for entire installation

Sidewalk Bicycle Rack Placement

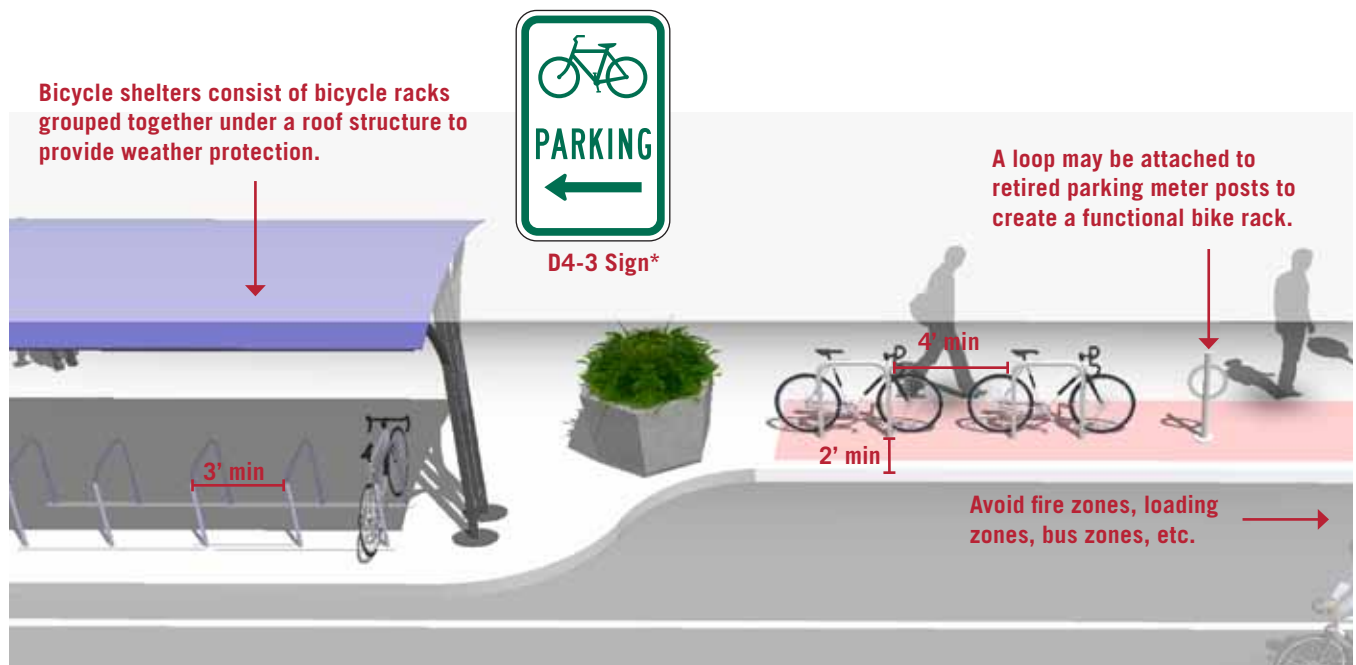
Description

Short-term bicycle parking is meant to accommodate visitors, customers, and others expected to depart within two hours. It should have an approved standard rack, appropriate location and placement, and weather protection. The Association of Pedestrian and Bicycle Professionals (APBP) recommends selecting a bicycle rack that:

- Supports the bicycle in at least two places, preventing it from falling over.
- Allows locking of the frame and one or both wheels with a U-lock.
- Is securely anchored to ground.
- Resists cutting, rusting and bending or deformation.

Guidance

- 2 feet minimum from the curb face to avoid dooring; 3 feet between parallel racks; 4 feet between end-to-end racks.
- Close to destinations; 50 foot maximum distance from main building entrance.
- Minimum clear distance of 6 feet should be provided between the bicycle rack and the property line.
- Should be highly visible from adjacent bicycle routes and pedestrian traffic.
- Locate racks in areas that cyclists are most likely to travel.
- For a sign, either the MUTCD D4-3 sign (shown below) or the LTD custom sign (see Appendix B) may be used



*As defined in the Manual of Uniform Traffic Control Devices, section 9B.23 (<http://mutcd.fhwa.dot.gov>)

Discussion

Where the installation of racks on sidewalks is not possible (due to narrow sidewalk width, sidewalk obstructions, street trees, etc.), bicycle parking can be provided in the street where on-street vehicle parking is allowed in the form of **on-street bicycle corrals**.

The two types of short-term racks most suitable for sidewalk installation are staple racks and hoop-and-post racks.

Some types of bicycle racks may meet design criteria, but are discouraged except in limited situations. This includes

undulating wave racks, schoolyard wheel bender racks, and spiral racks.

Materials and Maintenance

Use of proper anchors will discourage vandalism and theft. Racks and anchors should be regularly inspected for damage. Educate snow removal crews to avoid burying racks during winter months. Where multiple racks are needed, welding them to a mounting rail in series will make it harder for thieves to unbolt a rack and remove the bicycle.

Bicycle Racks for Non-Standard Bicycles

Description

Bicycle parking should be provided for bicycles with longer wheelbases and wider carriages than standard bicycles. Design standards for the racks themselves remain the same, however special consideration should be given to location, clearance space, and weather protection. Long-tail bicycles, cargo bicycles, recumbents and other non-standard bicycle types may not fit in standard lockers, vertical/hanging racks or on double decker racks.

- Non-standard bikes may also be too heavy or awkward to safely lift onto a vertical rack.
- Supports the bicycle in at least two places, preventing it from falling over.
- Allows locking of the frame and one or both wheels with a U-lock. (A staple rack or hoop & post rack function well for big bikes as long as there is enough clearance to adjacent bikes or walls.)
- Is securely anchored to ground or a wall.
- Resists cutting, rusting and bending or deformation.

Guidance

Same guidance as **Sidewalk Bicycle Rack Placement** plus:

- Minimum clear distance of 4 feet should be provided between the bicycle rack and adjacent racks or obstructions.
- Minimum distance of 9 feet in length should be provided. A 5 foot aisle should also be provided.
- Should be highly visible from adjacent bicycle routes and pedestrian traffic.
- Provide signage designating priority use of the rack for longer/wider bicycle types.
- When providing curb-side parking, consider orienting bike parking parallel to the curb.
- The percentage of bicycle racks that should accommodate non-standard bicycles will vary by community and context, but should range from 10% to 15% for multifamily, commercial/retail, and schools.



Discussion

Non-standard bike types require greater consideration with regard to bike rack placement and orientation because they occupy more space, and may be more difficult to maneuver in tight spaces. These bikes can be as long as 8 feet 4 inches (28 inches longer than standard bikes) and as wide as 36 inches (twice the width of standard bikes). Because of their size, most of these bikes have self-supporting kickstands, but bike racks should still offer support in two places, especially since the shape of the frame may limit areas to secure a lock. If adequate space is not provided for

larger bikes, they are more likely to be parked improperly and/or obstruct sidewalks or other access ways.

Materials and Maintenance

Use of proper anchors will discourage vandalism and theft. Racks and anchors should be regularly inspected for damage.

Hoop & Post Bicycle Rack

Guidance

Same guidance as [Sidewalk Bicycle Rack Placement](#) plus:

- Preferred clear distance of 3 feet between the bicycle rack and adjacent walls or obstructions.
- 3 feet preferred between parallel racks, 2 feet min; 4 feet 6 inches preferred between end-to-end racks, 4 feet min.
- When providing curb-side parking, consider orienting bike parking parallel to the curb.



Description

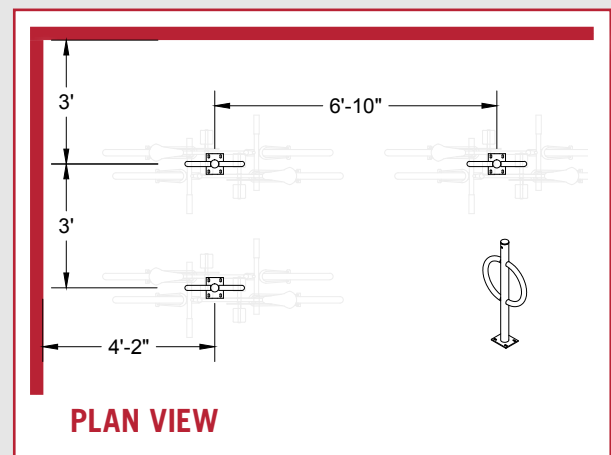
Hoop and post racks offer two points of contact for bicycle frames, which prevents bikes from falling over. They are relatively space-efficient and require only a single point of installation into the sidewalk. It is possible to retrofit coin operated parking meter posts into hoop and post racks by removing the meter head, then installing a hoop that has been specifically designed to fit on the remaining post. The hoop provides a secure spot to lock the bike and prevents a thief from lifting the bike up over the top of the post and stealing the bike.

Materials and Maintenance

Use of theft-resistant anchor fasteners will discourage vandalism and theft. Racks and anchors should be regularly inspected for damage.

Cost Range:

\$60 - \$110 per bike



Staple or Inverted U Bicycle Rack

Description

The staple, also known as the inverted U rack, provides a very simple locking solution. With its stable footprint and two sturdy posts, the staple rack provides two points of contact for the bike to lean against. It can accommodate a wide range of bicycle types, including oversized or unusually sized bicycles, provided it is installed appropriately. The two legs of the rack also make it easy for users to lock a standard u-lock to each leg, gracefully accommodating two bicycles (one on each side). Staple racks are the most common bicycle rack type used in the U.S., due to their utility and relatively low cost.

Guidance

Same guidance as [Sidewalk Bicycle Rack Placement](#) plus:

- Preferred clear distance of 3 feet between the bicycle rack and adjacent walls or obstructions.
- 3 feet preferred between parallel racks, 2 feet minimum; 4-1/2 feet preferred between end-to-end racks, 4 feet minimum.
- When providing curb-side parking, consider orienting bike parking parallel to the curb.
- Racks can be staggered where space is constrained.



Discussion

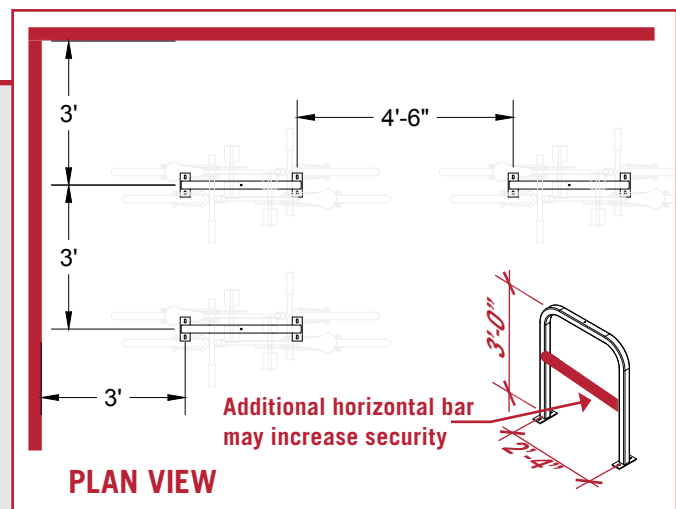
The rail-type rack design (inverted U with additional horizontal cross member) may offer an additional level of security for most bikes, since the bike rack (or bike lock) must be cut rather than simply unfastening the bike rack.

Materials and Maintenance

Use of proper anchors will discourage vandalism and theft. Racks and anchors should be regularly inspected for damage.

Cost Range:

\$75 - \$150 per bike



Coat Hanger

Guidance

- 1 foot 2 inches minimum from adjacent walls; 6 feet minimum between parallel racks; 2 feet 6 inches between end-to-end racks.
- Close to destinations; 50 foot maximum distance from main building entrance.

Cost Range:

\$50 - \$150 per bike

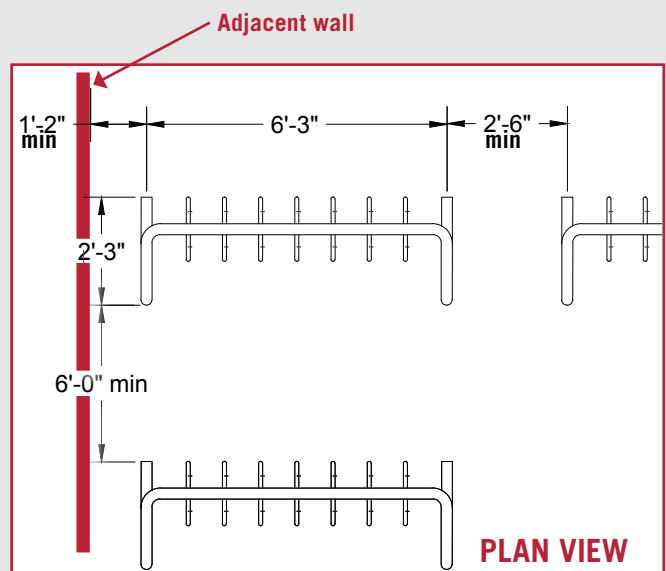


Description

Coat hanger racks do provide two points of contact for bicycle frames, and they can be relatively space-efficient. However, the coat hanger rack is not as desirable as the staple for several reasons. The locking loops, or coat hangers, to which bikes attach are often spaced too closely together to fit as many bikes as the manufacturer claims can be accommodated. Even if they are spaced far enough apart, they do not provide a good leaning platform for the bike. Bicycle handlebars tend to catch on the rack, and users with baskets, buckets, or utility racks may have trouble using the interior spaces.

Materials and Maintenance

Use of proper anchors will discourage vandalism and theft. Racks and anchors should be regularly inspected for damage.



Art Rack

Guidance

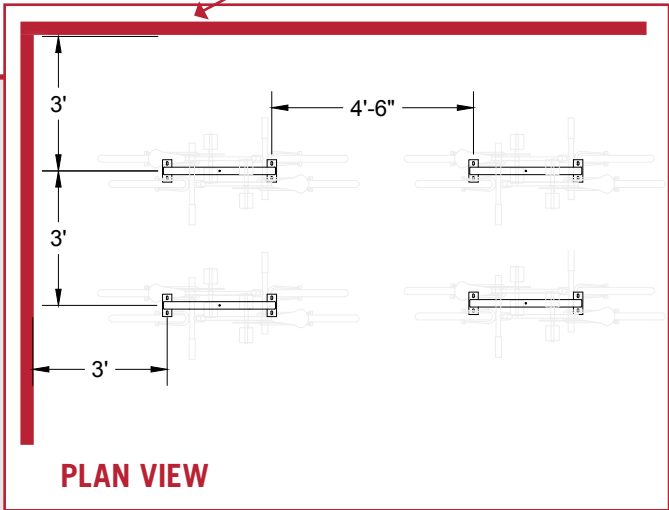
- Provide clearances similar to Staple Racks above.
- Close to destinations; 50 foot maximum distance from main building entrance.

Cost Range:

Cost varies widely and is dependent upon the cost of materials and complexity of the design. Art racks can range from \$0 for found recycled objects to thousands of dollars per bike.



Adjacent wall



Description

Art racks can vary in their execution, but when done well, they can meet all the criteria for good bike parking, including two points of contact. Art racks can be purchased, pre-made, from manufacturers, or can be custom artworks created for the occasion. The art racks shown here sit in front of a veterinarian's office.

Materials and Maintenance

Use of proper anchors will discourage vandalism and theft. Racks and anchors should be regularly inspected for damage. Inspect and repair any unique features or surfaces of an art rack.

Wall Hanging



Description

Wall hanging racks are common for tight indoor spaces. They have a smaller footprint than similar capacity floor mounted racks and can be staggered vertically to further increase capacity and accommodate bicycles with wider handlebars. They can be as simple as a hook mounted to the wall to hold the front wheel in place, or more complex with a tray for the wheels and a horizontal bar or other solid device to which to lock. If wall hanging racks are used, floor-mounted racks should also be provided for those who may not be able to lift their bikes up onto the wall.

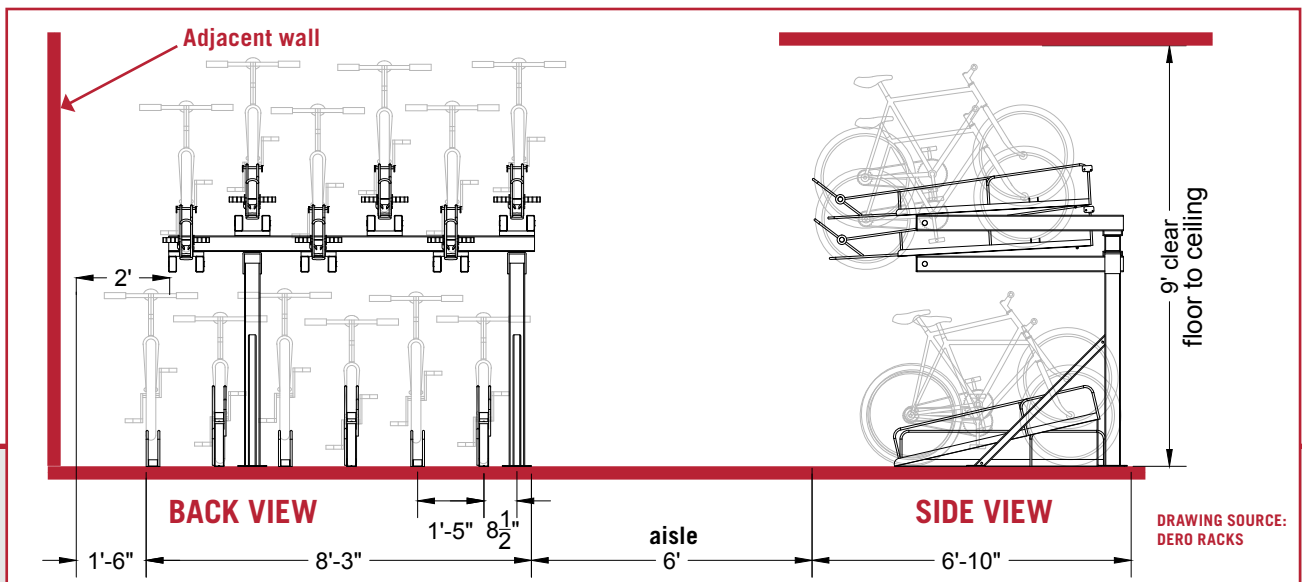
Guidance

- 16 inches preferred, 14 inches minimum horizontal spacing between bikes.
- Stagger racks vertically so that handle bars will not interfere with one another.
- Mount wall hanging racks so there will be 2 inches minimum between floor and tire.
- Maintain 5 foot aisle to allow maneuvering room

Materials and Maintenance

Regularly inspect the functioning of moving parts. Mop floor under hanging bikes and clean wall where tires rest to remove road grime left behind by bicycles.

Two-Tier / Double Decker Bicycle Racks



Description

Two-tier, or double-decker, racks are a good option for long term parking when trying to maximize the amount of bike parking available. As the name describes, the two-tier rack provides hardware that can stack an additional layer of bikes on top of a ground level layer. Racks designed with springs or pneumatic arms to aid the user in lifting the bike are preferred to those without mechanical assistance.

Materials and Maintenance

Regularly inspect the functioning of moving parts. Replace hydraulic arms if lifting power becomes unacceptable. Clean rack trays to remove dirt and grime sediment left behind by dirty bicycles.

Cost Range:

\$300 - \$500 per space