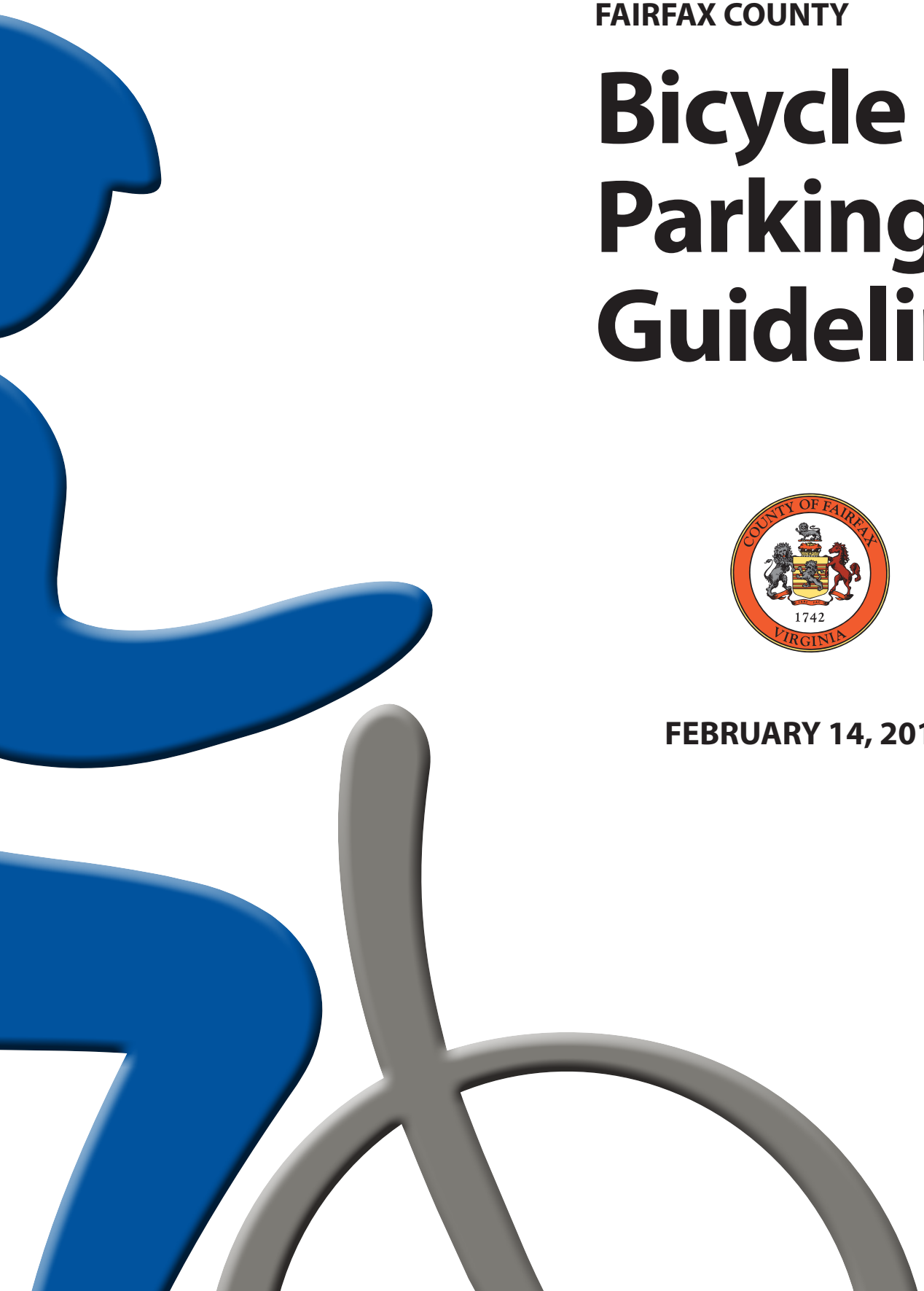
FAIRFAX COUNTY

Bicycle Parking Guidelines



FEBRUARY 14, 2017

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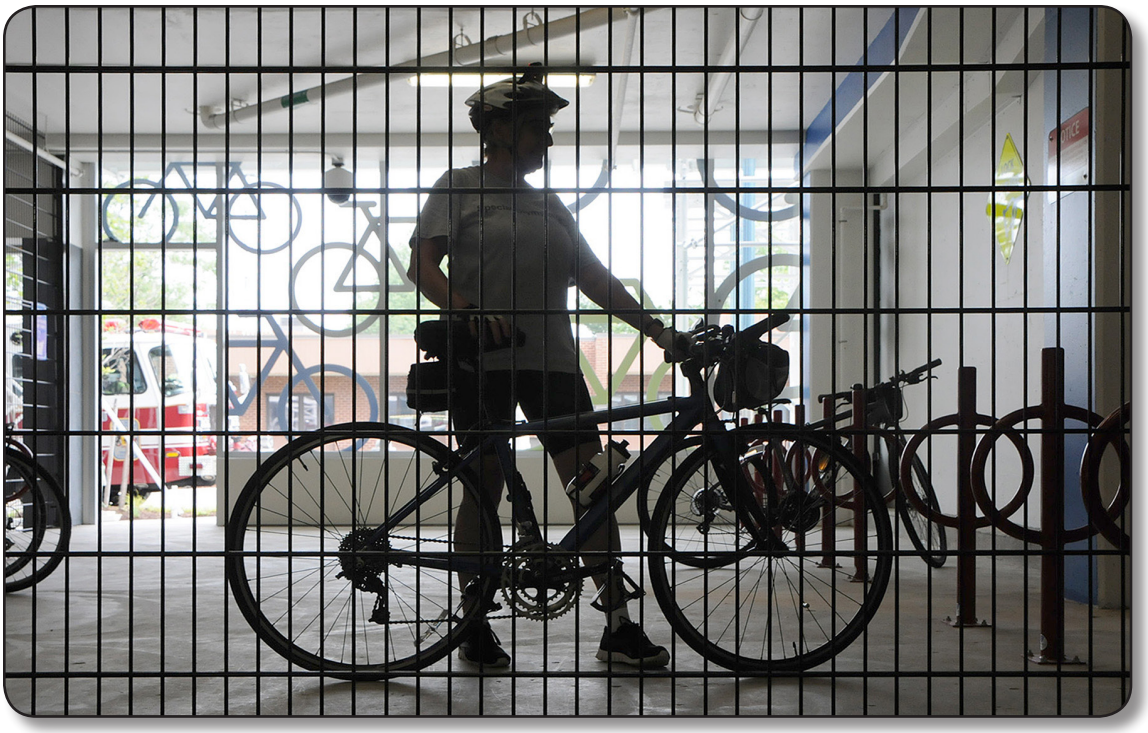
Fairfax County Department of Transportation would like to acknowledge all those who helped in making this document come together: the Association of Pedestrian and Bicycle Professionals (APBP), Fairfax County Department of Planning and Zoning, Fairfax County Office of Commercial Revitalization, the City of Alexandria, Arlington County, Washington Metropolitan Area Transit Administration (WMATA), Dero, Cycle-safe, and the Fairfax Alliance for Better Bicycling (FABB).

I. Introduction

In late 2005, the Fairfax County Board of Supervisors unanimously approved the Comprehensive Bicycle Initiative, a program designed to make Fairfax County both bicycle friendly and safe. One of the major goals of the program is to encourage bicycling as a reasonable mode of transportation for commuting to and from employment, shopping or running errands, visiting friends and neighbors, as well as for recreation. Bicycling is a healthy and environmentally friendly way to get around the County.

A major obstacle to promoting bicycling is the lack of ample, safe, and secure bicycle parking. Initial surveys of existing bike parking facilities in Fairfax County revealed not only a shortage of racks but that many racks have been installed incorrectly or placed in undesirable locations. The Board of Supervisors directed the Fairfax County Department of Transportation (FCDOT) to develop a policy and design guidelines for bicycle parking.

This document will serve as a resource and provide direction to the development community and government entities directly involved with the planning, design, installation, and maintenance of bicycle racks throughout Fairfax County. It outlines best practices and defines the preferred types of racks, the proper placement/installation, and the number of racks suggested based on land use classifications. These guidelines should guide all new development in Fairfax County, as well retrofits to existing sites.



II. Classifications of Bicycle Parking

Similar to automobile parking needs, well designed accommodations should be made for bicycle parking. Surveys have shown that the leading deterrent to potential bicycle commuters is lack of safe, secure, and convenient parking.

Bicycle parking is defined by two general categories: short-term and long-term.

Table 1, adapted from the "Association of Pedestrian and Bicycle Professionals (APBP) Bicycle Parking Guidelines, 2nd Addition" summarizes the differences and applications of short-term and long-term bicycle parking.

Table 1
Short-Term and Long-Term Bicycle Parking

Criteria	**Short-Term Parking** (Emphasizes Convenience and Accessibility)	**Long-Term Parking** (Emphasizes Convenience and Security)
Duration	Less than two hours	Greater than two hours
Fixture Type	Rack	Locker, Rack in secure location
Weather/Elements	Unsheltered, but Sheltered is desirable	Sheltered or Enclosed
Security	Unsecured - Passive Surveillance	Secured - Active or passive surveillance. Individual - secure such as lockers. Shared - Secure such as bike rooms or cages.
Land Use Applications	Commercial/retail centers, schools, libraries, multi-family residential (visitors), places of employment, and transit facilities	Places of employment, multifamily residential, and transit facilities (e.g. transit stations, park and ride lots)
Desirable Location	≤ 50 FT from primary building entrance	Desirable ≤ 300 FT Preferred ≤ 100 FT from primary building entrance*

*While it is desirable to locate bicycle parking facilities in close proximity to the primary entrance, many long-term parking facilities are located in structured parking garages separated from the residence or place of employment. In these situations, bicycle parking should be located in a safe and convenient location in close proximity to the elevator core, garage entrance/exit, or employee entrance.

Short-term Parking (for Visitors, Residents, Shoppers, Guests, and Employees)

Short-term parking emphasizes convenience and accessibility. These include the racks located at the library, municipal buildings, schools, cafes, and retail centers. Bicycle racks should be integrated into the overall streetscape design.

Short-term bicycle parking consists of a bicycle rack(s) intended for site users. Preferably, these racks should be located within 50 feet, but no more than 100 feet of the primary entrance and should be under cover, protected from the elements, and be highly visible. The preferred bicycle rack type is the inverted "U" rack (or variation of the "U" rack) but other racks can be used in consultantation with the Fairfax County Department of Transportation (FCDOT).

Each "U" rack can accommodate two bicycles. This simple design provides two contact points for the bicycle and allows multiple alternatives for locking the bicycle (frame and one or both wheels). Additional types of custom bike racks are shown below Section IV describes in greater detail equipment choices and installation guidance.

Tysons Corner Shopping Mall, Tysons, VA
Source: Macerich

Chinatown, Washington, DC
Source: DDOT

Long-term Bicycle Parking (for Employees, Commuters, and Residents)

Long-term bicycle parking, sometimes referenced as Class I bicycle parking, emphasizes not only convenience but also security. This type of bicycle parking accommodates commuters, employees at their place of employment, and residents of multi-family dwellings where the duration of parking is usually two hours or more. These parking amenities include bike lockers, bike cages, and bike rooms. These facilities offer fully enclosed and locked storage and are accessed with a key, a coded lock, or an electronic access device.

Bicycle cages or bike rooms are usually interior spaces and can be located in parking garages, office buildings, or multi-family residential buildings. In addition to providing secure storage for bicycles, some rooms include additional amenities such as lockers, showers, changing areas, and, in some cases, equipment and tools for minor repairs.

To maximize usage, rooms and cages can be configured with space-saver racks, including wall/floor mounted vertical racks and/or two-tier or double-decker style racks (if ceiling clearances are adequate). It is advisable to incorporate standard "U" racks in the room/cage design to accommodate individual needs and special equipment. A minimum of 30 percent of the total parking capacity should be allocated to floor mounted inverted "U" racks.

Bicycle lockers are free standing units usually grouped together in clusters ranging from two units and up, and are generally located outdoors convenient to the primary entrance to places of employment or transit facilities. Each locker accommodates one bicycle. Lockers provide a secure enclosure and protection from weather. They are anchored to the ground and are constructed of durable tamper resistant materials such as steel, aluminum, or fiberglass reinforced plastic. Individual lockers are normally assigned to one user and rented on an annual basis or provided free by the employer. Some jurisdictions are experimenting with shorter term rentals. Bicycle lockers are available at most park and ride lots, transit transfer centers, and Metrorail stations in Fairfax County.

III. Bicycle Parking Requirements and Ratios

How many bicycle parking spaces do you need? The parking calculations as shown in Tables 2A and 2B are based on national trends using a mode share of one percent to five percent bicycle. They define the number of required bicycle parking spaces, including both short-term and long-term parking.

Fairfax County is a large, complex county with land uses ranging from agricultural and low density residential to suburban office campuses and emerging urban centers, such as Tysons.

After reviewing trends for bicycle parking in adjacent jurisdictions, as well as other American and Canadian cities, it was determined that a "one size fits all" parking recommendations for bicycles would not work. Tables 2A and 2B provide a matrix outlining the recommended minimum number of parking spaces using the Land Classification System as defined in the Policy Plan element of the County's Comprehensive Plan.

As the matrix indicates, higher levels of bicycle parking requirements are suggested as part of the mixed use centers, specifically, urban centers and transit station areas, including all transit oriented developments. Higher bicycle mode share is anticipated in these centers.

Table 2A
Bicycle Parking Recommendations *excluding* Urban Centers and Transit Station Areas (TSA)

Use	Short-Term Parking	Long-Term Parking
Single Family Detached Residential	n/a	n/a
Multi Family Residential	One visitor space/50 units of portion thereof	One space/10 units or portion thereof
Commercial Retail	One visitor space/10,000 SF of floor area or portion thereof	One employee space/25,000 SF of floor area or portion thereof
Office	One visitor space/20,000 SF of floor area or portion thereof	One employee space/10,000 SF of floor area space or portion thereof
Industrial Areas	One visitor space/20,000 SF of floor area or portion thereof	One employee space/25,000 SF of floor area or portion thereof
Institutional Uses (e.g. Libraries, Schools, Government Facilities)	To be determined in consultation with FCDOT. (Factors include: size of building, number of students, surrounding bicycle infrastructure, number of vehicle parking spaces, etc.)	

Bicycle parking spaces should be installed at interior and/or exterior locations that are convenient to the retail customers and employees. Locations should be reviewed by FCDOT.

Table 2A
Bicycle Parking Recommendations for Urban Centers and Transit Station Areas (TSA)

Use	Short-Term Parking	Long-Term Parking
Single Family Detached Residential	n/a	n/a
Multi-Family Residential	One visitor space/25 units of portion thereof	One space/3 units or portion thereof
Commercial Retail	One visitor space/5,000 SF of floor area or portion thereof	One employee space/12,500 SF of floor area or portion thereof
Office	One visitor space/20,000 SF of floor area or portion thereof	One space/7,500 SF of floor area space or portion thereof

Bicycle parking spaces should be installed at interior and/or exterior locations that are convenient to the retail customers and employees. Locations should be reviewed by FCDOT.

IV. Equipment Choices

What makes a good bicycle rack? Its function is simple. The rack should be securely anchored to the ground; it should support the bicycle in at least two places preventing it from tipping over; it should provide multiple points of locking securing both the frame and one or both wheels; it should be constructed of tamper resistant materials; and it should accommodate a variety of bicycle types and sizes. An effective bicycle rack should also complement area aesthetics and reflect the design elements of the streetscape.

Inverted "U" Rack and Variations

The inverted "U" or hoop rack is the preferred bicycle rack. This rack is simple in design, low cost, and available in a multitude of colors and finishes. The tubing can be round, elliptical, or square. Mounting options include: in-ground, surface mount with base plate, and rail mounting. The standard specification and installation requirements for an inverted "U" rack are attached in Appendix B of this report.

Inverted "U" or Hoop Rack, Chantilly Library, Fairfax, VA

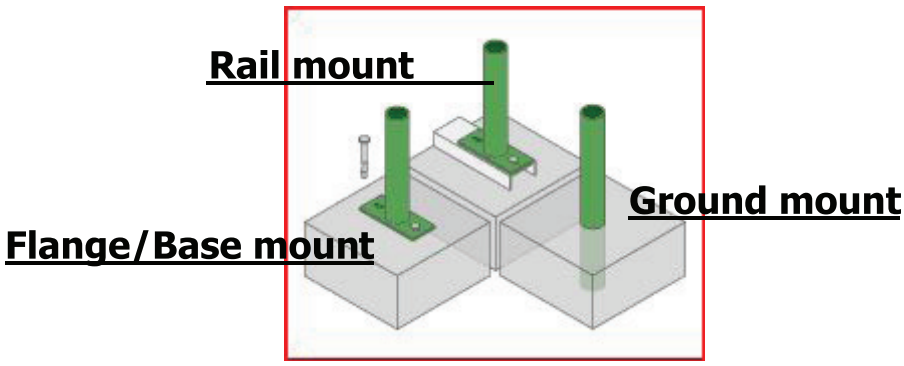
Variations of the "U" rack design are acceptable as long as basic rack functions and security features are maintained. Some examples of good, acceptable racks include the: post and ring, hitch rack, and swerve rack.

Post and Ring Style Rack
Source: DERO Bike Racks

Swerve Rack
Source: DERO Bike Racks

Installation Guidance

Racks can be installed individually or clustered together. There should be at least 36" between each inverted "U" rack to allow for two bicycles to park adjacent to each other. Mounting options include flange/base plate, rail mounted, or ground/core drilled.



Source: DERO Bike Racks

Art Racks

Specially designed bicycle racks are becoming more popular. These "art racks" can incorporate a municipal or corporate logo, a design reflective of the neighboring environment, or simply capture the imagination of the artist. These racks are acceptable as long as the basic rack functions as stated earlier are met. The examples below are a sampling of how municipalities and businesses are customizing their bicycle parking.

PNC Bank: Fairfax County, VA

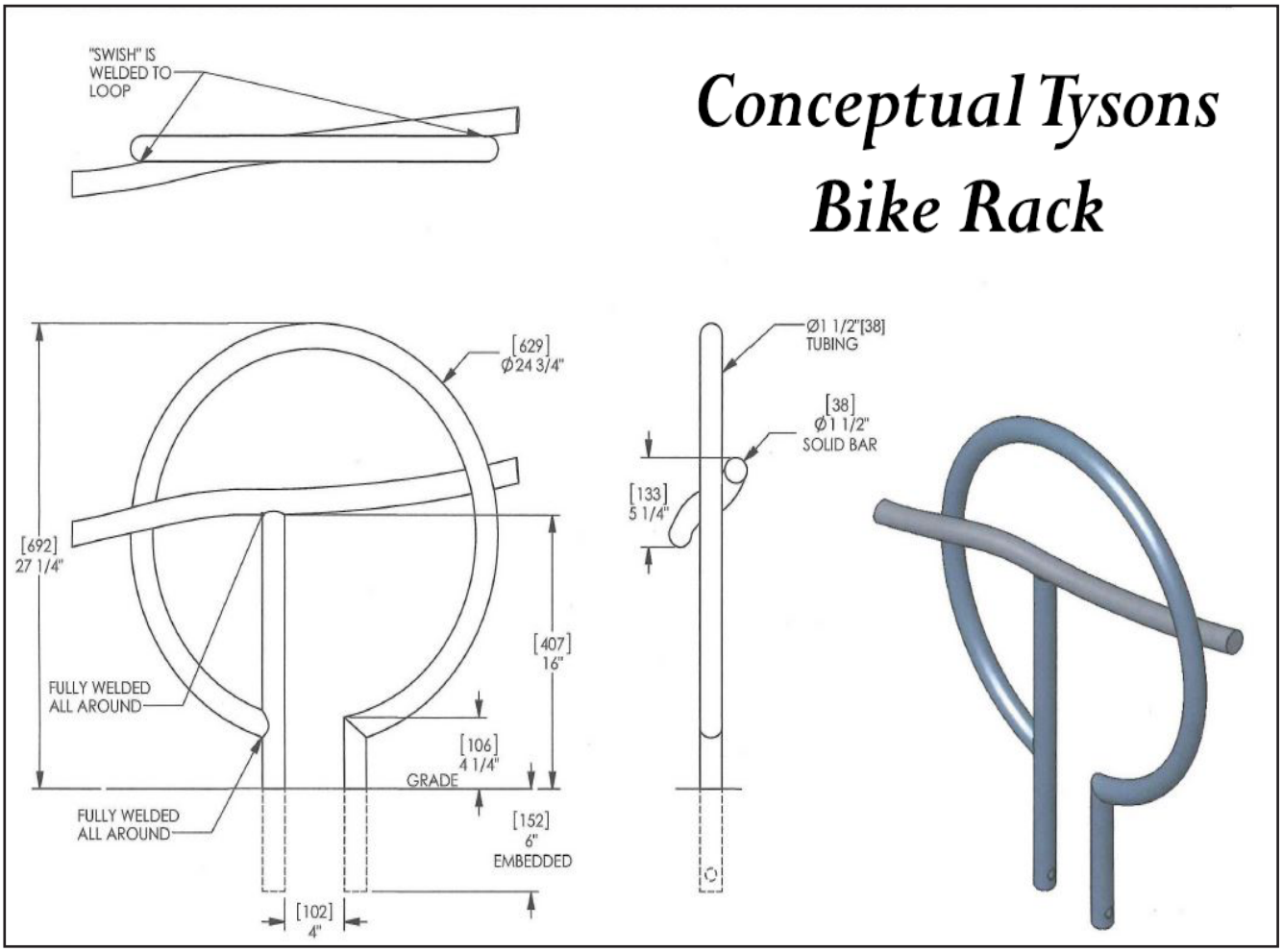
Source: FCDOT

Pittsburgh, PA

Source: BikePGH.org

Areas and Districts with Urban Design Guidelines

Several areas within Fairfax County including McLean, Annandale, Merrifield, and Tysons have design guidelines that identify street furniture specific to that area or district. These Urban Design Guidelines provide guidance on bicycle parking. The type of bicycle parking equipment, including material and color, should be compatible to the street furnishings selected for that specific area. The example below shows a conceptual design specific to Tysons. The rack is a variation of the "ring" style rack from Landscape Forms incorporating the Tysons branding into the design. This design meets FCDOT specifications.



Undesirable Racks

Many bicycle racks currently on the market do not address the basic elements of good bicycle parking. They do not provide adequate support, nor do they provide multiple contact points for locking the bicycle. In many cases, bicyclists will use them in a way not intended by the manufacturer. The photo to the right shows a bicycle locked parallel to a schoolyard (radiator, grid, or grill) style rack. This is a typical occurrence with this style rack as well as the undulating (wave) style rack and significantly reduces the parking capacity of the rack.

Types of bicycle racks that are not recommended for use in Fairfax County include, but are not limited to: schoolyard or radiator style racks, wheel blocks, and undulating or wave racks. If in doubt about a specific rack, contact FCDOT for design assistance.

The photographs on this page show examples of bike racks that are not recommended.

Radiator Style Rack

Wheel Block Racks

Wave (Undulating) Rack

V. Placement and Installation Guidelines

Selecting the right equipment is only the beginning. Placement and location of racks and lockers is important and ensures the proper use, capacity, and security of these amenities.

Initial surveys of existing bike parking amenities in Fairfax County revealed that many racks have been installed incorrectly and/or placed in undesirable locations. This section will outline the proper placement, layout, and spacing required for both bicycle racks and bicycle lockers. Appendix A provides a series of figures graphically depicting typical placement dimensions for various situations including converting on-street parking and garage parking stalls

Inadequate distance between racks restricts use

Incorrect positioning of Inverted "U" Racks

Poor location and choice of equipment restricts usage

Bicycle Rack Placement

Use the following guidelines when locating and placing bicycle racks. If the installation falls within an area or district with urban design guidelines, additional criteria regarding rack placement may be defined in those guidelines. Consult those specific guidelines in the Fairfax County Comprehensive Plan.

- Bicycle racks should be conveniently located to building entrances, preferably within 50 feet of the primary entrance but no more than 100 feet. Long-term bicycle parking should be located as close as possible to the building entrance, but can exceed these distances if conditions warrant.
- Racks should be located so as not to impede pedestrian movement. A minimum clear pedestrian area of seven feet should be maintained (measured from rack to obstacle).
- Racks should not be located within five feet of a crosswalk or accessible curb cut ramp.
- At intersections, racks should be placed a minimum of ten feet back from the beginning point of curvature of the curb radius.
- Racks should not be located within five feet of a fire hydrant or within ten feet of a siamese fire connection.
- Rack placement should not impact sight distance requirements at intersections, driveways, or commercial entrances, as specified in the VDOT Road Design Manual.
- Racks can be located adjacent to on-street parking spaces, but should be located away from door zones and not impede access. Avoid locating racks adjacent to spaces delineated for handicap parking.
- At bus stops, rack placement should not impede the loading/unloading of transit passengers and restrict ADA circulation.
- Bicycle racks should not be located within three feet of sign posts, light poles, manholes, trees, and other street furniture.
- For the safety of the rider and to minimize theft, locate bicycle parking amenities in visible, well lit, and well-travelled areas.
- Bike racks placed in the VDOT right-of-way will require a VDOT permit

VI. Interior Bicycle Storage Options

As bicycling grows in popularity and bicycle parking demands increase, more employers, government agencies, and transit providers are providing secure rooms, cages, or designated interior spaces dedicated to bicycle parking. These areas are normally located within buildings, structured parking garages, or transit stations and offer added security and convenience for the user. The facilities offer secure controlled access and bicycle securing apparatus, and can also include convenience features such as: seating, lockers and showers, changing rooms, a water fountain, vending machines, and dedicated repair/maintenance stations equipped to perform basic repairs/adjustments. The US Green Building Council (USGBC) has identified these elements in its Leadership in Energy and Environmental Design (LEED) certification guidelines.

- To maximize storage, rooms can be configured with space-saver racks, including wall/floor mounted vertical racks and/or two-tier or double-decker style racks (if ceiling clearances are adequate).
- These interior spaces can be configured in many different ways to meet the needs of the users. A bike room in a multi-family apartment building may be different from one designed for employees or transit system users. Although different, there are some common design elements that make a well-designed bike room.
- Access can be as simple as a keyed lock, coded cipher lock, or electronically controlled with a card reader device. Make sure interior handles or lock releases cannot be reached through the fencing from outside the room.
- If locating the facility in a structured parking garage, minimize bicycle travel in the garage by locating it on the ground floor convenient to the entrance/exit. Site the facility to reduce or eliminate vehicular conflicts.
- The facility should be located in an area that is heavily traveled or near the garage attendant's booth and well lit.
- Clear visibility is critical for safety. Avoid designs that create secluded areas. Walls should be open utilizing architectural fencing, glazing, or other open design treatments. Make sure the room is well lit. If the room is enclosed with solid walls inhibiting visibility, video surveillance should be included in the room design.
- Fencing should run floor to ceiling. Openings or gaps, if unavoidable, should be less than eight inches.
- To enhance personal safety, the room should be cell phone signal enabled. Providing emergency call boxes or similar alarm options should be evaluated.

- Before ordering equipment, make sure there is a workable plan/layout. Room height and vertical clearances from pipes, vents, and lighting could limit the use of double stack racks and vertical style racks.

- Think of the design vehicle/equipment and the users when laying out the room. Some bikes can't fit vertically on a wall or on a double stack rack. The room should accommodate a wide range of bikes, including bikes with trailers. Use the 70/30 rule: A minimum of 30% of the total parking capacity should be allocated to floor mounted inverted "U" racks or an equivalent style rack. With the growing popularity of electric assist bicycles, special parking areas with access to electrical outlets/charging stations should be evaluated as part of your room design.

Wiehle-Reston East Metrorail Station Bike Room, Reston, VA

- Bicycle Parking signage should also be including around the site to inform users where indoor bike parking is located

Appendix A: Placement Guidelines

Figure A: Typical Rack Spacing: Curb/Sidewalk Section I

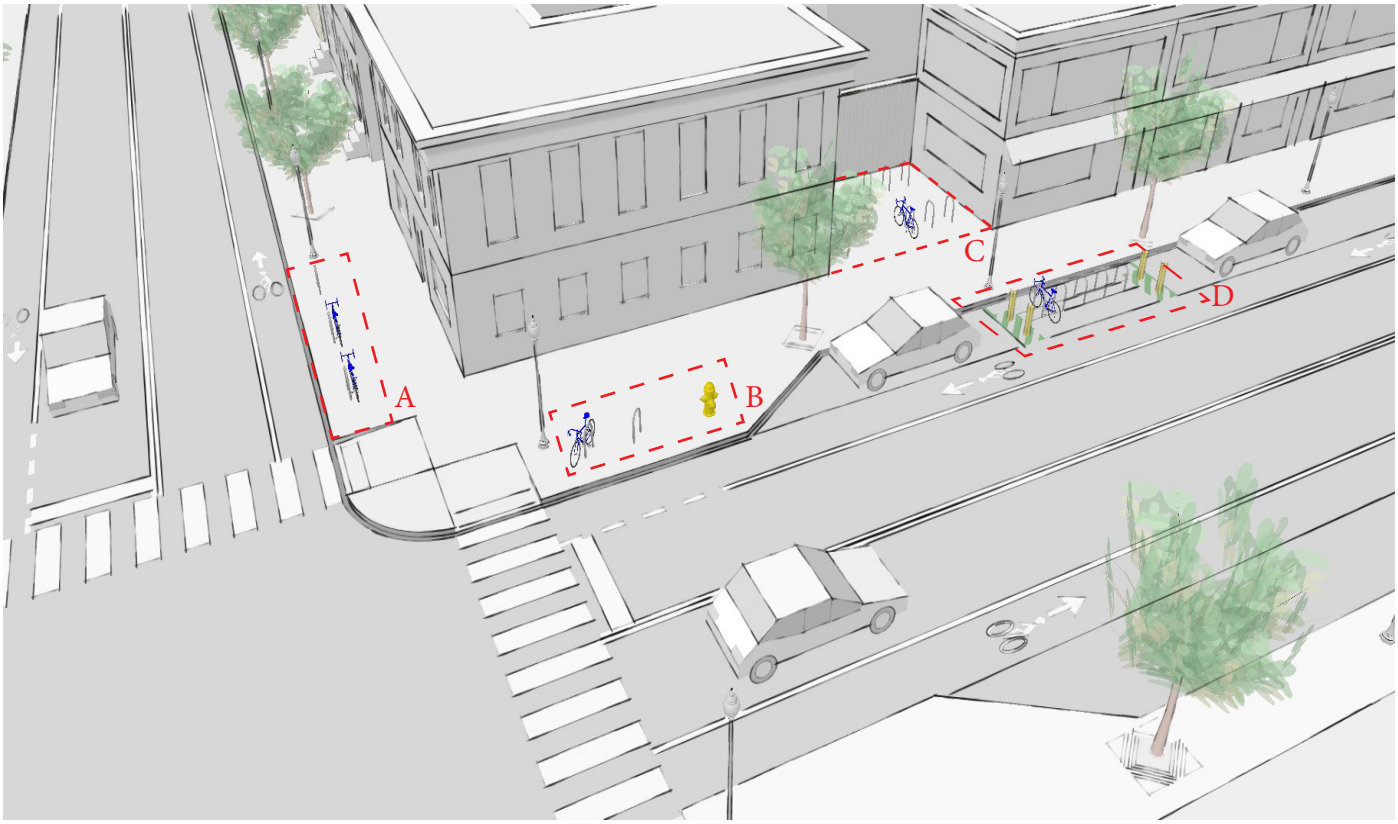
Figure B: Typical Rack Spacing: Curb/Sidewalk Section II

Figure C: Typical Rack Spacing: Wall Section

Figure D: Converting On-Street Parking to Bicycle Parking*

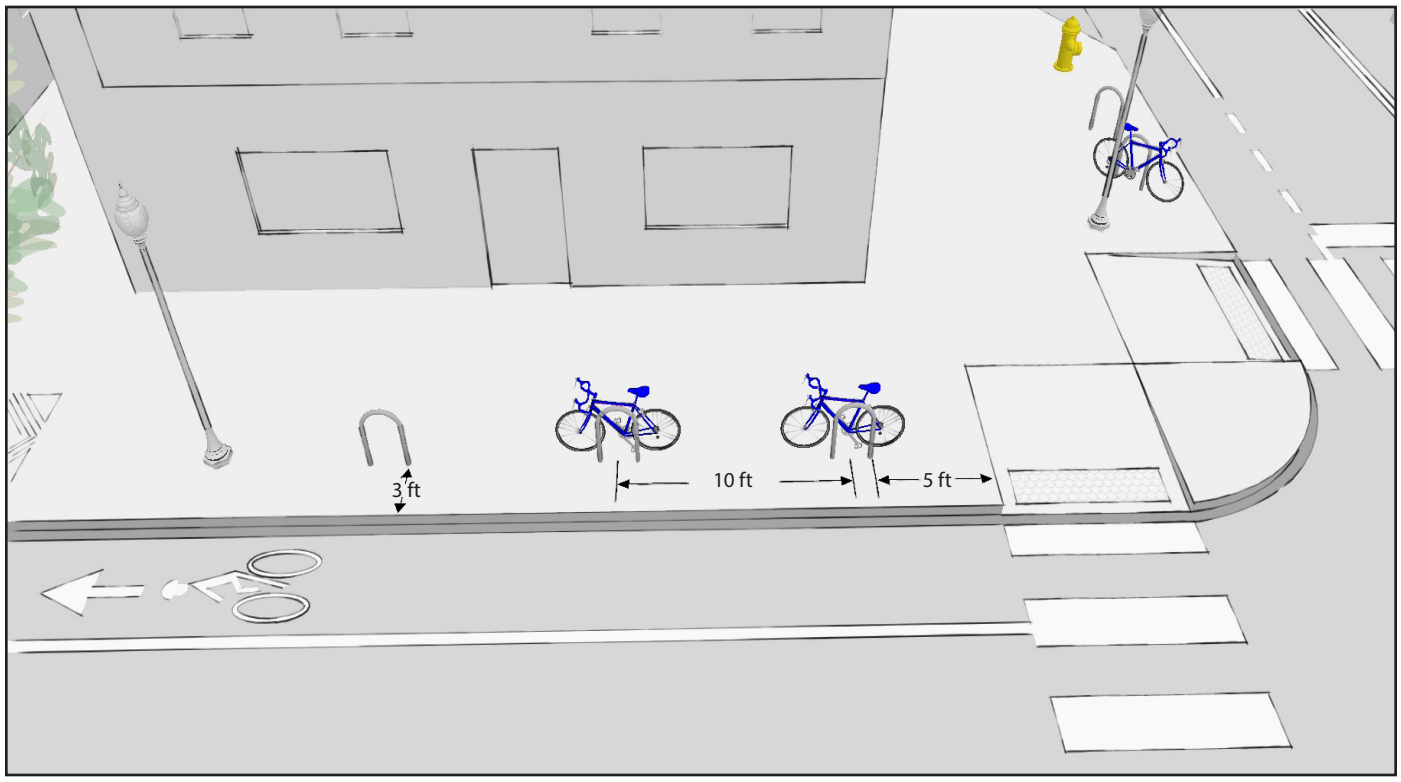
Figure E: Typical Bicycle Locker Site Layout

Figure F: Typical Bike Room Layout



*Requires Virginia Department of Transportation (VDOT) approval if within the VDOT right of way

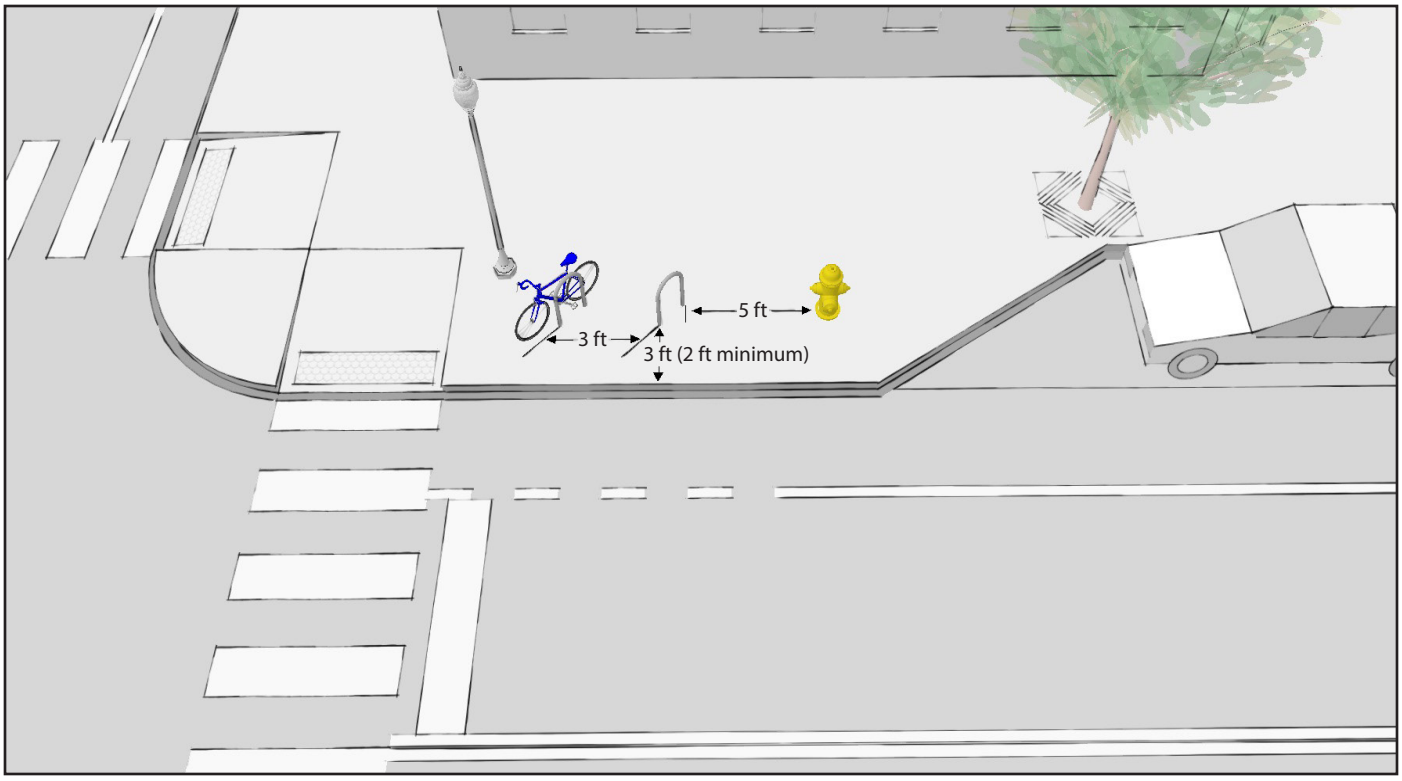
Figure A Typical Rack Spacing: Curb/Sidewalk I



General Design Notes:

- Minimum spacing between racks = 3 ft
- Minimum distance between rows of racks = 10 ft (measured from centerline of rack)
- Minimum distance from rack to back of curb (rack is perpendicular to curb) = 2 ft
- Minimum distance from rack to back of curb (rack is parallel to curb) = 3 ft
- Minimum distance from rack to curb (diagonal installation) = 2 ft

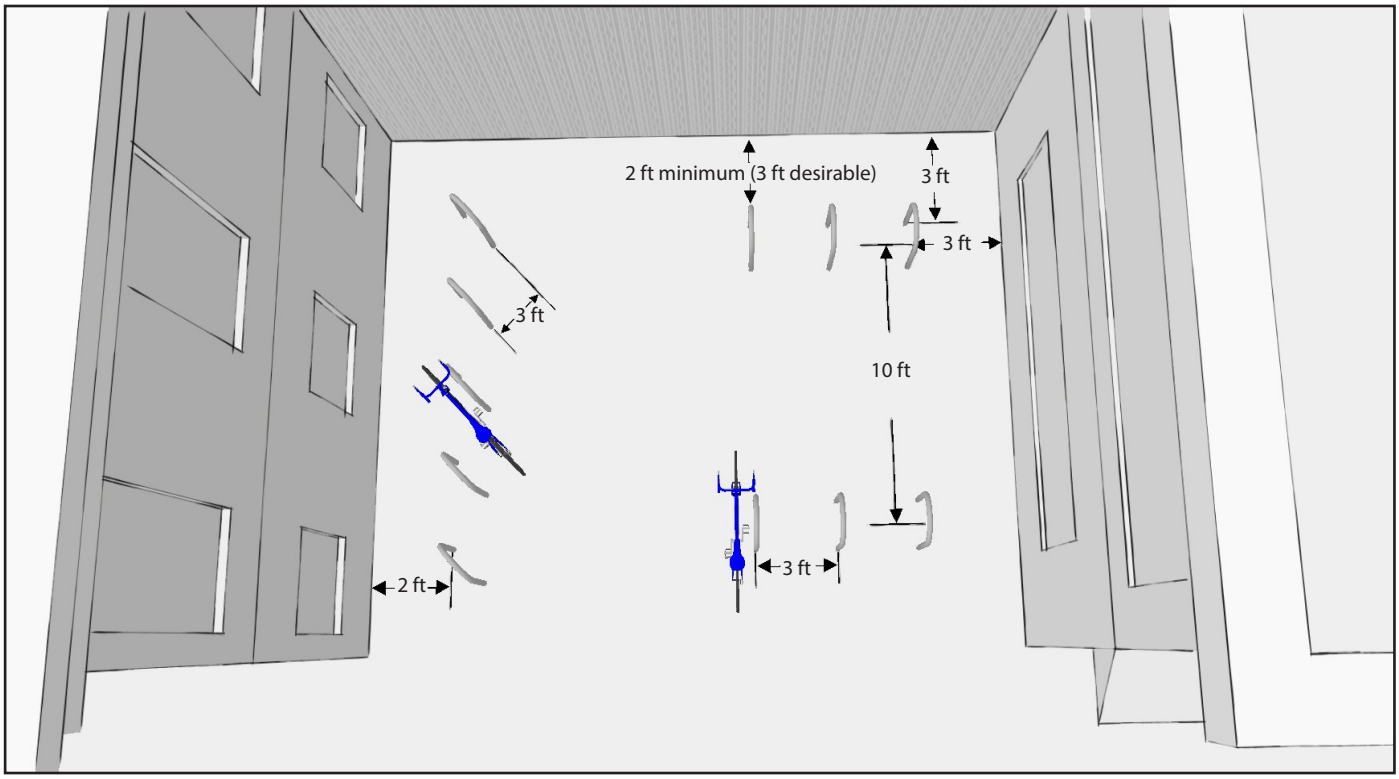
Figure B Typical Rack Spacing: Curb/Sidewalk II



General Design Notes:

- Minimum spacing between racks = 3 ft
- Minimum distance between rows of racks = 10 ft (measured from centerline of rack)
- Minimum distance from rack to back of curb (rack is perpendicular to curb) = 2 ft
- Minimum distance from rack to back of curb (rack is parallel to curb) = 3 ft
- Minimum distance from rack to curb (diagonal installation) = 2 ft
- Minimum distance from rack to fire hydrant = 5 ft

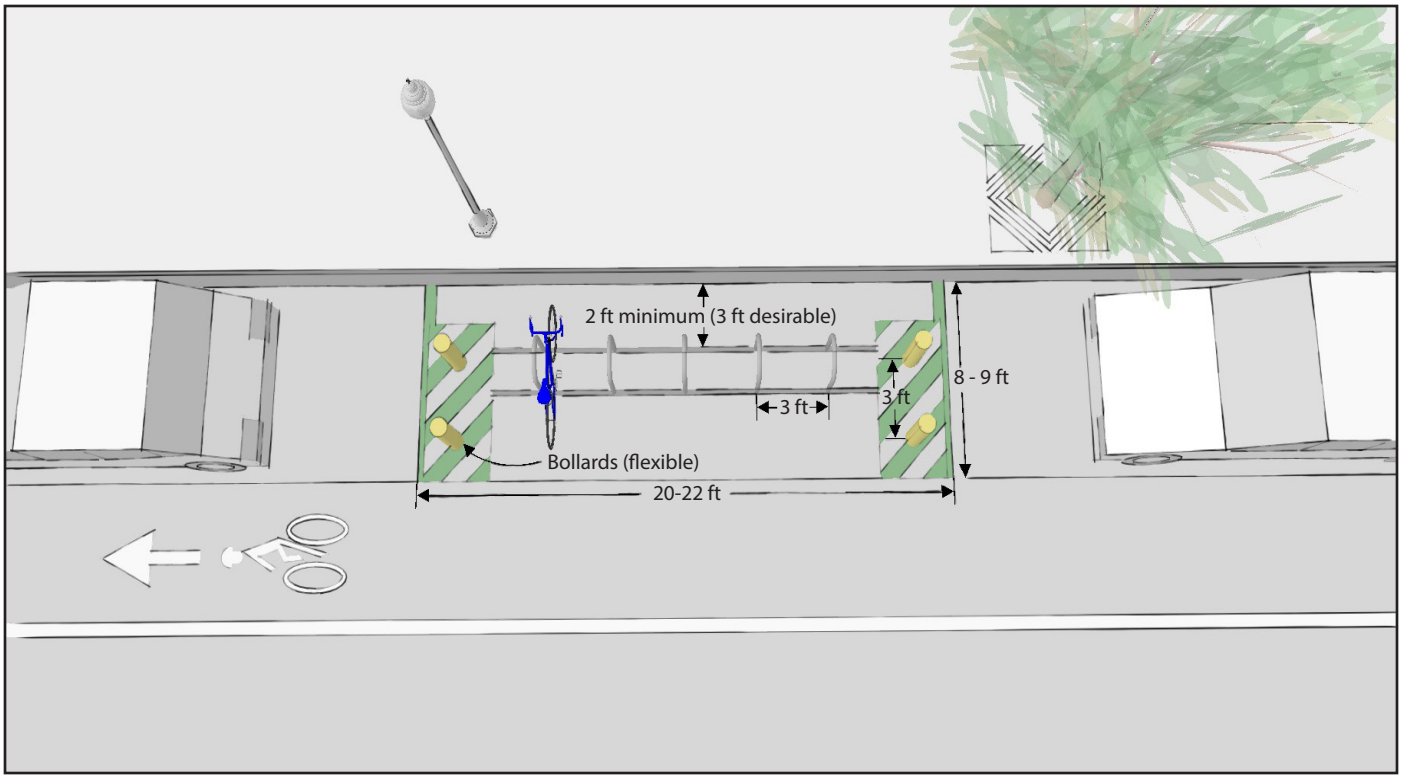
Figure C Typical Rack Spacing: Wall



General Design Notes:

- Minimum spacing between racks = 3 ft
- Minimum distance between rows of racks = 10 ft (measured from centerline of rack)
- Minimum distance from rack to wall (rack is perpendicular to wall) = 2 ft
- Minimum distance from rack to wall (rack is parallel to wall) = 3 ft
- Minimum distance from rack to wall (diagonal installation) = 2 ft

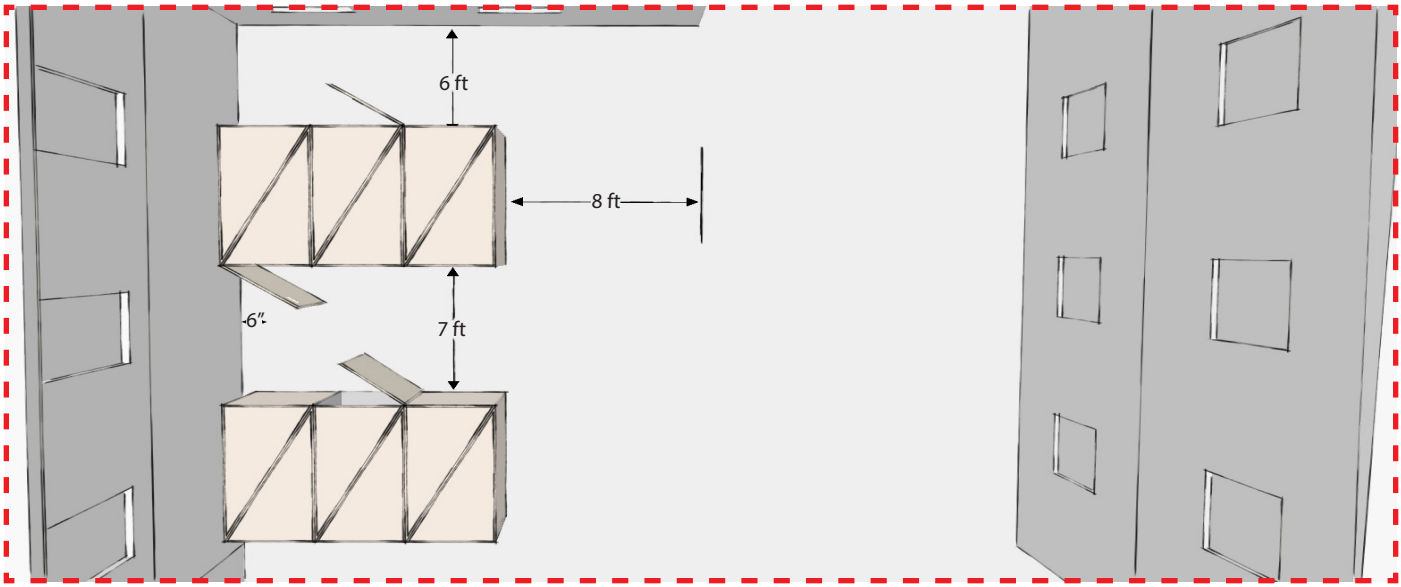
Figure D Converting On-Street Parking to Bicycle Parking

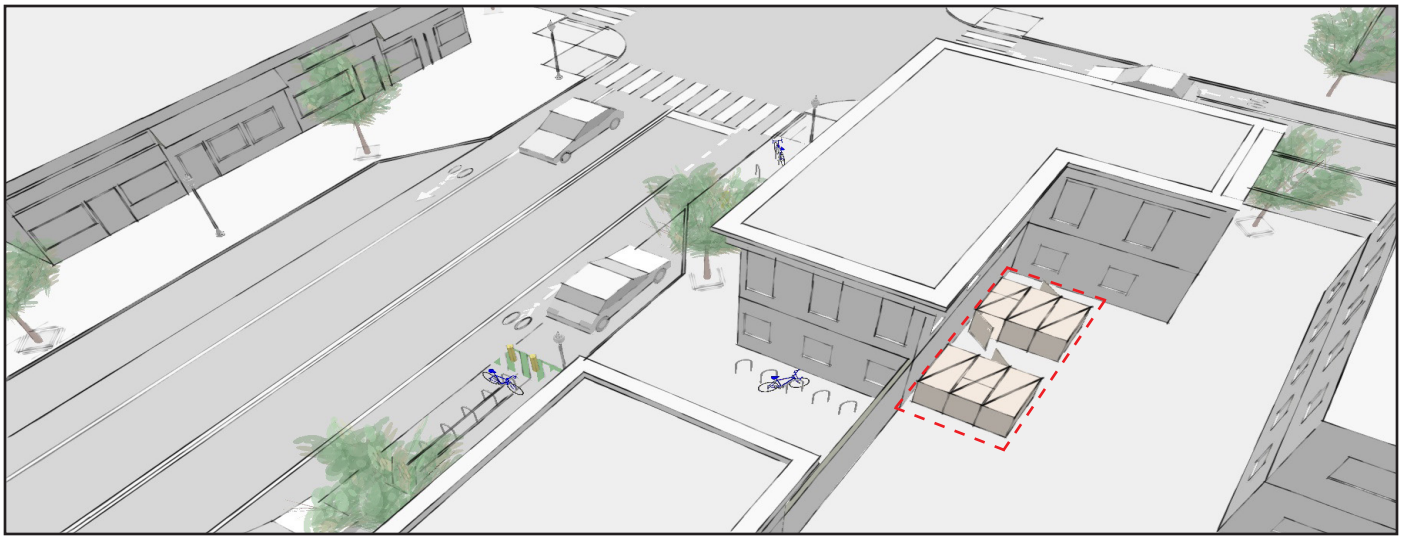


General Design Notes:

- An on-street parking space is typically 20 - 22 ft in length and 7 - 9 ft in width
- One parking space can normally accommodate 10 - 12 bicycles. This example shows five "U" racks mounted on rails, providing parking for up to 10 bicycles.
- The on-street area designated for bicycle parking should be visually and physically delineated using pavement markings and bollards (rigid or flexible)
- It is advisable to use removable bollards and movable bicyle racks (e.g. inverted "U" racks mounted on rails or cycle stalls). This installation option provides for flexibility and easy removal (for maintenance and snow events)

Figure E Typical Bicycle Locker Layout

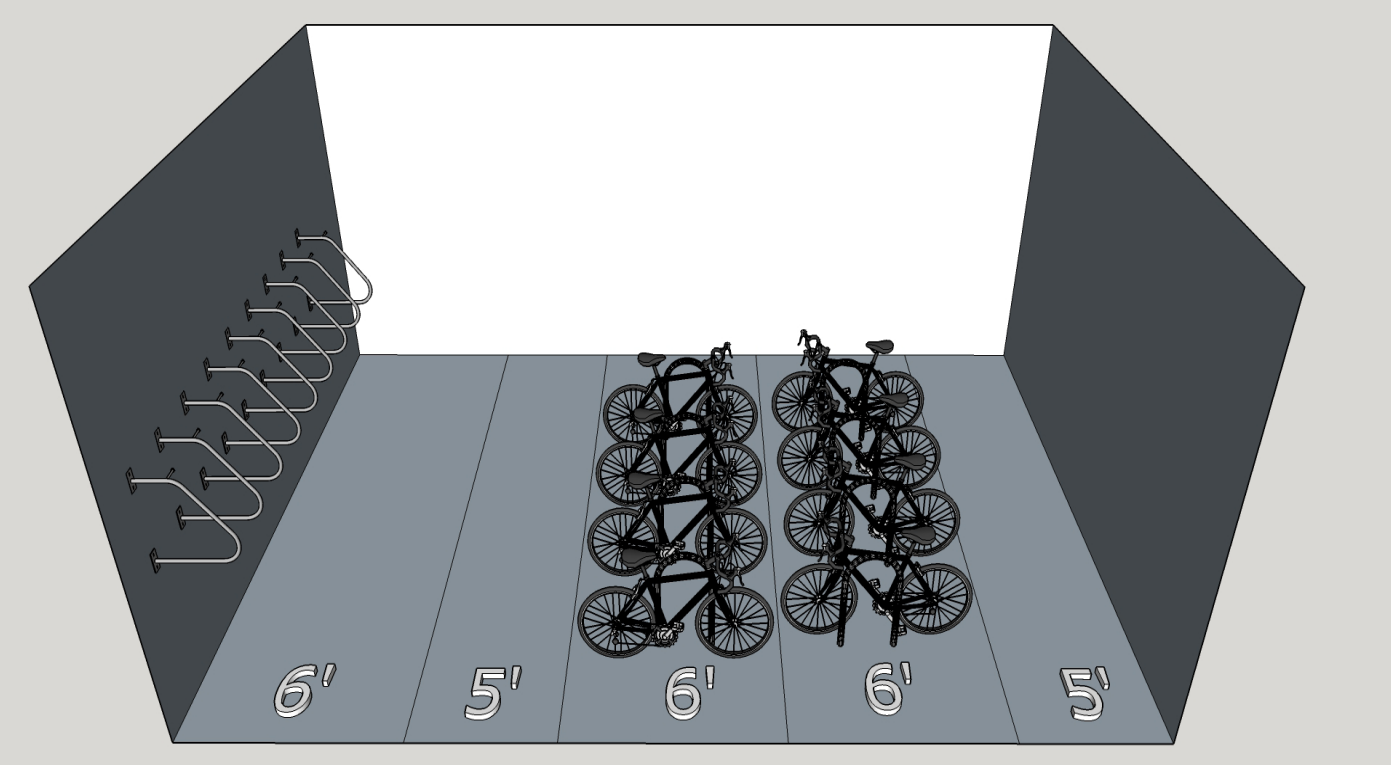




General Design Notes:

- Minimum spacing between lockers = 7 ft
- Minimum distance from locker to wall (side of locker) = 6 in
- Minimum distance from locker to wall (front of locker) = 6 ft
- Minimum distance between locker and pedestrian area (walkway) = 8 ft

Figure F Typical Bike Room Layout



General Design Notes:

- Combine use of ground mounted bike racks and wall mounted/vertical bike racks to maximize parking capacity of a bike room
- Follow manufacturer specifications for spacing of wall mounted/vertical bike racks
- Minimum distance from wall to walkway aisle for vertical bike racks = 6 ft
- Minimum distance of walkway aisle between racks and wall/verticle bike rack area = 5 ft
- Minimum width for ground mounted bike rack = 6 ft
- Minimum spacing between ground mounted bike racks = 3 ft

Appendix B: Equipment Suppliers

Fairfax County Department of Transportation does not endorse any particular vendor. The list below represents a sampling of vendors who manufacture and/or sell bicycle racks and lockers. Not all racks/lockers offered by these vendors meet Fairfax County specifications. Questions regarding particular rack design and acceptability can be addressed to the Fairfax County Department of Transportation Bicycle Program staff.

Bicycle Rack Vendors

Creative Metalworks	**www.creativemetalworksllc.com**
Creative Pipe	**www.creativepipe.com/bike_racks**
Cyclesafe	**www.cyclesafe.com**
Dero Bike Racks	**www.dero.com**
Josta	**www.josta.de**
Landscapeforms	**www.landscapeforms.com**
Madrax	**www.madrax.com**
Saris	**www.saris.com**
Sportworks	**www.sportworks.com**

Bicycle Locker Vendors

Cyclesafe	**www.cyclesafe.com**
American Bicycle Security Company	**www.ameribike.com**
Madrax	**www.madrax.com**
Dero	**www.dero.com**

Notes:

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