

L E S S O N 2 2

Bicycle Parking and Storage

22.1 Purpose

Bicycle parking is one of the most important investments in order to improve and encourage bicycle travel in urban areas. This lesson describes how to develop a successful bicycle parking program, including implementation strategies, resource requirements, and design considerations.

22.2 Problem Overview

Providing secure bicycle parking is a key ingredient in efforts to encourage bicycling at the local level. Many bicycle journeys end somewhere other than the bicyclist's home and, as a result, the bicyclist must park his or her bicycle. And for those who live in apartment complexes, college dormitories, or other high-density settings, the issue of where to leave a bike while at home is also a serious issue. In short, at one time or another, most bicyclists have experienced the frustration of finding no secure place to leave their bikes.

Some have experienced the even greater frustration of returning to find their bicycles stolen. In fact, statistics compiled by the Federal Bureau of Investigation show that between 1988 and 1992, an average of approximately 450,000 bicycles were reported

stolen each year. These figures are low, according to the Lock Smart Campaign, which estimates that roughly twice as many are stolen, but never reported. They suggest that, with an average cost of \$380 per bike, the financial loss to American bicyclists amounts to \$450 million dollars per year.

While providing secure bicycle parking is not the entire solution to the problem of theft, it certainly can help and it can increase bicyclists' comfort in leaving their bicycles unattended. As a result, many bicycle owners may be encouraged to make bicycle trips that they might otherwise forego.



22.3 Solution Overview

Bicycle parking can be provided in a wide variety of settings using three basic approaches: bicycle racks (open-air devices to which a bicycle is locked), bicycle lockers (stand-alone enclosures designed to hold one bicycle per unit), and bicycle lock-ups (site-built secure enclosures that hold one or more bicycles).



This trail provides many site amenities, including short-term bike parking.

For short-term parking, bicycle racks work well. At sites that require long-term parking for a variety of potential users, lockers are the devices of choice. For long-term parking for a limited number of regular and trustworthy users, bicycle lock-ups can solve the problem.

22.4 Objectives

1. To provide well-located secure bicycle parking at popular destinations in business districts and at other public sites:

- Install bicycle parking at public centers.
- Install bicycle parking on public rights of way in neighborhood commercial and downtown business districts.



At community destination points such as schools, ample bike parking should be provided.

- Encourage private businesses to provide bicycle parking for their customers.
- Install bicycle parking at transit stops and in parking garages.
- Encourage the installation of high-security bicycle parking at existing worksites, schools, and high-density residential developments .

2. To require new commercial, public, and high-density residential developments to include plans for bicycle parking:

- Adding provisions to local zoning regulations requiring bicycle parking as part of new developments, particularly commercial, public, and high-density residential developments.
- Make these requirements part of the process of getting a building permit.

22.5 Implementation Strategies

Implementing bicycle parking in a community requires a combination of three primary strategies:

1. Acquire and install bicycle parking devices on public rights of way or at public destinations (e.g., city hall, libraries, and parks).
2. Encourage businesses to provide bicycle parking for their customers.
3. Alter zoning regulations to ensure that bicycle parking is provided in new developments.

Typically, the first strategy helps “prime the pump” for the second; and the third strategy helps ensure long-term improvements in newly developed areas.

22.6 Subtasks

1. Identify key implementors.

Each of the three implementation strategies requires the cooperation of a different group of constituencies. To put bicycle parking in public places requires the cooperation of agencies who control the land involved. Sidewalks may be controlled by the streets or public works department, while parks and recreation may have responsibility for public open spaces and recreational sites. There may be an agency (similar to the Federal Government's General Services Administration) in charge of all public property. Or agencies that run specific services (e.g., the library, public health clinics) may control their own sites.

Encouraging businesses to install bicycle parking requires the cooperation of such groups as the Chamber of Commerce, downtown business associations, and shopping center managers. In addition, agencies that routinely deal with businesses should be enlisted as outlets for any literature developed as part of the program.

Altering zoning regulations to require consideration of bicycle parking in new developments requires close cooperation with planning and zoning agency staff, as well as the assistance from appointed zoning boards and builders' associations. Typically, regulations are revised on a schedule; therefore, the opportunity to revisit parking requirements may or may not be imminent.

2. Structure the program.

In some communities, a reactive program that simply fills orders and answers questions can prove to be successful. This would be most likely in a "bicycle town" with a high degree of interest in bicycling matters. However, in many places, such a passive approach would result in little response. Business owners and managers of large employment centers or residential complexes often see bicycles as clutter and a "problem" to be eliminated rather than as a solution to traffic congestion or air quality problems. As a result, a successful bicycle parking program



Encourage private businesses to provide bicycle parking for their customers.

should include elements of marketing and promotion.

With the help of the key players identified in Subtask 1, create three ad hoc task groups covering each of the three primary thrusts. The groups should create the ground rules and materials necessary for the following tasks:

Task Group 1: Public Bicycle Parking

- Install bicycle parking at public centers.
- Install bicycle parking on public right of way.
- Install bicycle parking at transit stops and in parking garages.

Task Group 2: Private Bicycle Parking

- Encourage private businesses to provide bicycle parking for their customers.
- Encourage installation of high-security bicycle parking at worksites, schools, and high-density residential developments.

Task Group 3: Zoning Regulation Revision

- Add provisions to local zoning regulations requiring bicycle parking.
- Make these requirements part of the process of getting a building permit.

3. Choose appropriate bicycle parking devices.

As one of the first tasks, assemble packets of information on available bicycle parking devices, along with the pros and cons of each device. In a joint meeting(s) with all three task groups, adopt a set of criteria and decide which devices are to be



Zoning ordinances should include provisions for bicycle parking that indicate how many spaces are required within specific districts.

endorsed. A set of possible criteria are listed in the Specifications section below. Next, give each task group its marching orders. They are as follows:

New ordinances should address the following: (examples taken from existing ordinances in Ann Arbor, MI; Madison, WI; Denver, CO; and San Francisco City/County, CA):

- Bike parking ordinances should clearly indicate how many bicycle parking spaces are required, either as a function of the type of development (retail, office, residential, etc.) or as a standard percentage of the required off-street automobile parking. For example, the City of Denver requires that off-street automobile parking facilities of 20 spaces or more provide bicycle parking equal to 5 percent of the automobile parking space requirement.
- Bicycle racks that support the bike by the wheel should not be permitted.
- Bicycle racks should be located at least as close to the building entrance as the nearest non-handicapped parking space.

The requirements can also address lighting of bicycle racks, requirements to retrofit existing public buildings, and protection from the elements.

4. Tasks for Task Group 1: Public Bicycle Parking.

Task Group 1 should set criteria for installing bicycle parking devices on sidewalks, as well as at public destinations. For sidewalks, criteria could include such items as minimum width of sidewalk,

rack position on sidewalk and proximity to other street furniture and vegetation, and number per block or number per site. For public sites, they could include proximity to the main entrance, and minimum number of bicycle parking spaces per installation (perhaps keyed to type of facility served).

Next, they should create an agreed-upon step-by-step procedure for planning and installation. This should include initial identification of the potential site, discussion with relevant agency personnel, determination of the specific site's needs (number of parking devices and location), cost analysis and budgeting, procurement, installation, and follow-up.

To support this activity, they should create a project sheet for rack installation that includes places for the source of the request (if any), signatures of any required agency personnel, a schematic diagram of the site, installation date, and any comments.

Next, they should estimate the total bicycle parking need for public places, given a list of potential sites. Estimates can be conservative and based to some extent on existing bicycle traffic, as long as participants realize that latent demand may be significant. For this reason, phased installation may be particularly appropriate.

For sidewalks, a base number of racks to be installed during the fiscal year (e.g., 100, 500, 1000) should be decided upon, along with a map showing priority areas. For instance, downtown might be a top-priority area, neighborhood commercial areas could be second, and strip development areas might be third.

Finally, the Task Group should set an annual budget for the program and decide how the bicycle parking should be paid for. Potential sources include a wide variety of Federal transportation programs, as well as local funding opportunities.

5. Tasks for Task Group 2: Private Bicycle Parking.

Task Group 2 should assemble a packet of information for potential private-sector bike parking providers. The packet should include a cover letter describing the importance of bicycle parking to businesses and giving any organizational endorsements for the program; a list of available parking devices, along with information on how to order them and which are best suited for which settings; tips on deciding how many bikes need to be accommodated; and tips on locating and installing the devices.

The Task Group should also work out details of any promotional activities that will need to be planned. For instance, they should develop a list of groups to talk with, determine who should be responsible for reaching each one, and start making contacts. To this end, the Task Group should develop a standard presentation, possibly including slides and hand-outs.

6. Tasks for Task Group 3: Zoning Regulation Revision.

The Task Group should start by identifying passages in the existing zoning codes where motor vehicle parking is discussed. They should find out when the regulations are going to be modified and use that in determining their schedule of work. They should next assemble sample bicycle parking laws from other communities. Based on the sample laws, they should create a draft revision to the regulations and circulate it for comment. Once comments have been received and considered, they should forward a final draft revision for action at the proper time.

Location Criteria

The location criteria are a mix of those developed by the Cities of Denver and Seattle for placing bicycle racks:

- Racks should be located within 50 feet of building entrances (where bicyclists would naturally transition into pedestrian mode).
- Racks should be installed in a public area within easy viewing distance from the

main pedestrian walkway, usually on a wide sidewalk with 5 or more feet of clear sidewalk space remaining (a minimum of 24 inches of clear space from the parallel wall, and 30 inches from the perpendicular wall).

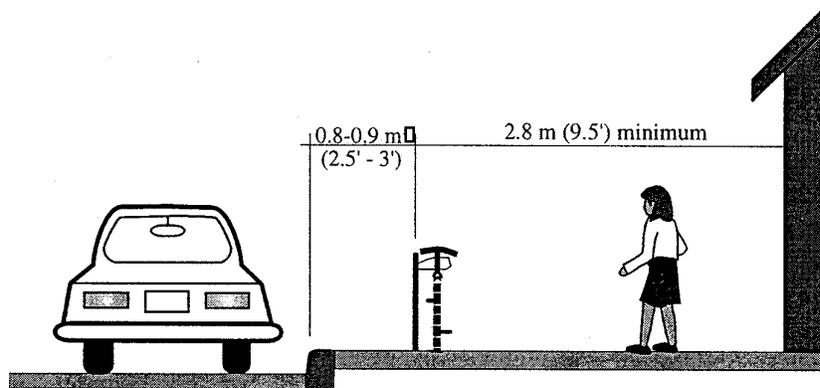
- Racks are placed to avoid conflicts with pedestrians. They are usually installed near the curb and at a reasonable distance from building entrances and crosswalks.
- Racks can be installed at bus stops or loading zones only if they do not interfere with boarding or loading patterns and there are no alternative sites.

7. Implement the program.

With the program set up, materials at the ready, and initial funding identified, implementation of the program can begin. Routine responsibilities for the various tasks should be taken care of by the agencies identified through the previous steps. Oversight of the program may require the attention of a project coordinator. This may be a task delegated to a member of the planning department or public works staff.

8. Evaluate progress.

As the work is proceeding, keep track of successes and failures. Early on, get the word out to the bicycling public that: (1) the program exists, and (2) they should submit comments and ideas for potential parking sites. Keep a record of how many parking



Philadelphia's standard for bike rack placement in business districts.

devices have been installed, how many comments have been received, how many information packets have been sent out, what proportion of public places has adequate bicycle parking, how well the parking is working (e.g., whether the public likes it, whether it holds up well to vandalism), and how successful the zoning regulations appear to be (once they are adopted). Use this feedback in fine-tuning the program and determining future levels of funding.



This is surely a location in need of adequate bicycle parking.

22.7 Resource Requirements

For the most part, bicycle parking requires basic equipment: racks and lockers. These can be ordered or fabricated in large or small quantities. Ordering in quantity can save money as long as storage needs can be satisfied until installation can be accomplished. Once a community gets actively involved in bicycle parking installation, it is quite possible that local sources will emerge. For instance, in some communities, welding shops make and sell approved bike racks on a routine basis. This not only helps agencies satisfy a growing bicycle parking demand, but it can lead to the development of new local industries.



Street trees in Central Business Districts often become de facto bike racks.

22.8 Schedule

Installing bicycle parking at public places and on sidewalks can begin with little delay. Encouraging businesses to install bicycle parking, being more of a marketing and promotion activity, involves building interest over time and may not pay off for several years. Even longer term are the results of changes in zoning ordinances. At the same time, these changes can lead to the greatest overall effect.

22.9 Specifications

It is important to choose a bicycle rack design that is simple to operate. Bicycle racks should be designed to allow the use of a variety of lock types. It may be difficult initially to determine the number of bicycle parking spaces needed: Bicycle racks should be situated onsite so that more racks can be added if bicycle use increases.

There are three general types of bicycle rack designs. The following is information on each style (derived from the April 1996 issue of *Pro Bike News*).

Class I Bicycle Parking

This category includes bike lockers or locked/guarded storage areas that provide high-security protection.

Advantages:

High-security storage, ideal for long-term storage.

Disadvantages:

Expensive. Average cost per bike: Starter unit is \$3,300, additional units are \$1,600 each.

Class II Bicycle Parking

This category includes racks that secure both wheels and bicycle frame, which usually have moving parts and provide medium security with a user-supplied lock.

Advantages:

Medium security, great when coupled with covered protection from the elements.

Disadvantages:

Moving parts, complex design, may not work with the common U-lock.

Average cost per bike: \$65to \$150.

Class III Bicycle Parking

The most common type of Class III rack is the inverted “U” or rail rack.

Advantages:

Simple design, affordable, can be manufactured by a local welder. Supports frame as well as wheel.

Disadvantages:

Offers low level of security for long-term parking.

Average cost per rack: \$75 installed (if purchased in quantities of 50 or more).

22.10 Sample Bike Parking Ordinance From Madison, Wisconsin

A growing number of communities have included bicycle parking requirements in their development regulations. By so doing, they ensure that bicycle parking is included in the normal course of development. This example is from the Madison City Code.

Purpose

To provide adequate and safe facilities for the storage of bicycles.

1. Bicycle parking facilities shall be provided as required for all new structures and uses established as provided in Sec. 28.11(2)(a)1 or for changes in use as provided in Secs. 28.11(2)(a)2 and 3; however, bicycle parking facilities shall not be required until the effective date of this paragraph. Notwithstanding Secs. 28.08(1)(i)



Bike lockers should be made available in areas where long-term parking is necessary.

and 28.09(5)(a), bicycle parking facilities shall be provided in all districts, including districts in the Central Area.

2. In the residential district, accessory off-street parking facilities provided for the uses listed herein shall be solely for the parking of passenger automobiles and bicycles of patrons, occupants, or employees and not more than one truck limited to a 1-ton capacity.
3. Required bicycle parking spaces shall be at least 2 feet by 6 feet. An access aisle of at least 5 feet shall be provided in each bicycle parking facility. Such space shall have a vertical clearance of at least 6 feet.
4. Accessory off-street parking for bicycles shall include provisions for secure storage of bicycles. Such facilities shall provide lockable enclosed lockers or racks, or equivalent structures in or upon which the bicycle may be locked by the user. Structures that require a user-supplied locking device shall be designed to accommodate U-shaped locking devices. All lockers and racks must be securely anchored to the ground or the building structure to prevent the racks and lockers from being removed from the location. The surfacing of such facilities shall be designed and maintained to be mud- and dust-free.



Bicycle racks should be situated on site so that more racks can be added if bicycle use increases.

5. Bicycle parking facilities shall be located in a clearly designated safe and convenient location. The design and location of such a facility shall be harmonious with the surrounding environment. The facility location shall be at least as convenient as the majority of automobile parking spaces provided.
6. Bicycle parking facility spaces shall be provided in adequate number as determined by the Zoning Administrator. In making the determination, the Zoning Administrator shall consider, when appropriate, the number of dwelling units or lodging rooms, the number of students, the number of employees, and the number of automobile parking spaces in accordance with the following guidelines.
 - (a) In all cases where bicycle parking is required, no fewer than two spaces shall be required.
 - (b) After the first 50 bicycle parking spaces are provided, additional bicycle parking spaces required are 0.5 (one-half) space per unit listed.
 - (c) Where the expected need for bicycle parking for a particular use is uncertain due to unknown or unusual operating characteristics of use, the Zoning Administrator may authorize that construction and provision of not more than 50 percent of the bicycle

parking spaces be deferred. Land area required for provision of deferred bicycle parking spaces shall be maintained in reserve.

22.11 References

Text and graphics for this section were derived from the following sources:

City of Philadelphia Bicycle Parking Specifications, 1998.

Institute of Transportation Engineers, *Implementing Bicycle Improvements at the Local Level*, ITE LP-471, Washington, DC, 1999.

Madison City Code, Madison, WI.

Pro-Bike News, April 1996.

For more information on this topic, refer to:

Bicycle Federation of America, *Source Book of Designs, Manufacturers, and Representatives*, 1992.

Bikecentennial, *Technical Notes: Bike Parking Location; Choosing Parking Devices; A Simple Bike Rack Design; Bike Parking Ordinances*, 1987-89.

Ellen Fletcher, *Bicycle Parking*, 1990.

Off-Street Bicycle Parking Guidelines

Land Use	Bike Space
Dwellings/lodging rooms	1 per dwelling unit or 3 lodging rooms
Clubs/lodges	1 per lodging room plus 3% of person capacity
Fraternities/sororities	1 per 3 rooms
Hotels/lodging houses	1 per 20 employees
Galleries/museums/libraries	1 per 10 automobile spaces
Colleges/universities/ junior high and high schools	1 per 4 employees plus 1 per 4 students
Nursery/elementary schools	1 per 10 employees, plus students above second grade
Convalescent and nursing homes/institutions	1 per 20 employees
Hospitals	1 per 20 employees
Places of assembly, recreation, entertainment, and amusement	1 per 10 automobile spaces
Commercial/manufacturing	1 per 10 automobile spaces
Miscellaneous/other	To be determined by the Zoning Administrator based on the guide lines for the most similar use listed above

Source: *Madison City Code*, Madison, WI

FHWA COURSE ON BICYCLE
AND PEDESTRIAN TRANSPORTATION