FINAL RECOMMENDATIONS

OVERVIEW

This section of the study recommends the implementation of expanded bicycle parking in New York City to best serve the needs of potential commuter cyclists. The recommendations build on research compiled and presented in the *Literature Review* and *Existing Conditions* sections in this study. Following is a summary list of the recommendations:

ON-STREET BICYCLE PARKING

- In areas with a dense concentration of commercial and retail space such as midtown Manhattan, where space for on-street bicycle parking is limited, new space should be created for such facilities. Space could be developed by widening sidewalks at both mid-block and end-block locations.

- Where parking for more than two bicycles is required, the NYCDOT *CityRacks* program should substitute use of the "Wave" rack for an alternate design that supports the bicycle in two places. Also, use of the "U" shaped rack should be augmented by use of the "Hitching Post" style rack.

- Where space is available, the installation of *CityRacks* should be accompanied by the installation of a protective canopy that offers shelter from the weather. Such a shelter could be modeled after the New York City bus shelter. In addition to weather protection, such a shelter would offer the advantage of raised public awareness.

BICYCLE LOCKERS

- Bicycle Lockers offer protection against theft, vandalism and weather. They serve typically as user-assigned, long-term parking facilities, installed at work and school destinations and at transit stations for intermodal connections. To encourage bicycle use as part of intermodal commuting in New York City, installation of bicycle lockers at the three major transit hubs - Grand Central Station, Pennsylvania Station and The Port Authority Bus Terminal - is recommended.

BIKE STATIONS

- Bike stations are attended, centralized locations for short and long term parking that usually feature a combination of the following services: bike rental, bike repair, accessory sales, food vending, shower and change facilities and tourist and travel information. Bike Stations should be implemented in locations where they will facilitate intermodal connections and/or access to areas with a high concentration of workplaces. In addition to the three major transit hubs, four recommended locations for a bike station in New York are Wall Street near the corner of South Street, the World Trade Center complex, the intersection of Broadway and Houston Street and the southeast corner of Union Square Park.

LOCAL LAWS AND ORDINANCES

- The NYC Zoning Resolution should be amended to require bicycle parking in conjunction with the construction and operation of all new, and continued operation of all existing, off-street parking facilities in Manhattan south of 96th Street. Any resolution should, at a minimum, identify the class and/or type of bicycle parking facility, the minimum number of bicycles to be accommodated and guidelines regarding placement of and access to said facilities.

- New York City Council Member Adolfo Carrion Jr.'s proposed amendment to the New York City Administrative Code to require building owners, citywide, to permit bicycle access to buildings with freight elevators, should be carefully reviewed by the City Council. It is recommended that the legislation include language that limit bicycle access to persons who live or work in the particular building.

- The City of New York should amend the Municipal Code to allow municipal employees who work in City owned or leased buildings to bring their bicycles into the building. Such an amendment should identify the class and/or type of bicycle parking facility, the minimum number of bicycles to be accommodated and guidelines regarding placement of and access to said facilities.

ENCOURAGEMENT

- The City of New York Department of Transportation should undertake a comprehensive public outreach campaign designed to encourage private property owners to provide safe, secure off-street bicycle parking facilities at/within their buildings. The campaign should recommend that building owners: survey building tenants to determine the quantity of bicycle parking spaces required; identify the most suitable means of accommodating projected parking needs; select a convenient location for a centralized parking facility if required; plan, design and construct the bicycle parking facility. The encouragement campaign should also point out resources from which assistance for the planning, design and funding of such facilities may be obtained.

ON-STREET BICYCLE PARKING

Introduction

On-street bicycle racks, typically placed on city sidewalks near the curb, are used by a variety of commuting cyclists including messengers, delivery people and shoppers. Friends visiting friends, students attending a class, and people running small errands also make use of the racks. At subway stations, particularly the Bedford Avenue L train stop in Brooklyn, a growing number of bicycles can be found locked to the *CityRacks* provided, the subway entrance railing and adjacent sign poles illustrating growth in the number of commuters using their bicycles to travel between home and the subway en-route to Manhattan.

Bedford Avenue Subway Entrance

Bicycle racks are only as useful, however, as they are available. Where they are not available, a suitable substitute, and a favorite among New Yorkers, is the ubiquitous green drive rail (the steel channel shaped pole) to which curbside parking regulation signs are attached. When no rack or drive rail is at hand, bikes typically get locked to any fixed object which permits the frame and/or at least one wheel of the bike to be locked to it. This leads to bicycles being locked up to inappropriate objects such as trees and in inappropriate locations where they may present a nuisance to pedestrians.

It is not uncommon to see bikes locked to newspaper vending boxes, trash receptacles and sometimes even the traffic signal control boxes that are typically clustered together at many New York City street corners.

Bicycle Chained to Tree

Bicycle Chained to Hydrant

Though newspaper vending boxes and trash receptacles may already be considered an inconvenience where pedestrian volumes are high and sidewalk space limited, the addition of a chained bicycle can render a corner hazardous. Clearly, there are areas in Manhattan where sufficient on-street bicycle parking is not provided.

Bicycle at Street Corner

NYCDOT CityRacks Program

As was described on page 63 of the *Literature Review* section, the City of New York Department of Transportation (CDOT) maintains the *CityRacks* program. The *CityRacks* program installs "U" shaped (2 bicycles) and "Wave" shaped (3, 5 or 7 bicycles) steel bicycle racks within the public right-of-way in response to public request and based on the Departments own field research. The racks are free standing and are typically attached directly to the sidewalk with expansion bolts and/or epoxy. The racks offer no protection from the weather.

Design - A successful bicycle rack design must be able to support a bicycle that can not otherwise stand by itself. The 'U' shaped rack, used by the CDOT *CityRacks* program, supports a bicycle at two points. The 'Wave' rack, however, used to accommodate more than two bicycles, supports bicycles at only one contact point allowing bikes to rotate about that point and eventually fall down.

Where bicycle parking for more than two bicycles is required, an alternate rack design should be chosen or two or more 'U' shaped bicycle racks can be placed side by side. Further, the 'U' rack should be augmented with 'Hitching Post' style racks (see Figures 1-8). The hitching post is more versatile by design, has a wide flat bar on which something may be written such as 'Bicycle Parking' and may prove a more attractive alternative to the 'U' rack.

Crowded CityRack at Union Squre

An additional alternative for bicycle parking are tree guards serving also as bike racks. While such designs protect the tree, they can also provide better support for the bicycle and allow the use of the popular U-shaped locks. Although trees in parks are usually not fenced by tree guards, it should be considered as option for trees on sidewalks and boulevards.

Location - Locations where *CityRacks* may be placed are limited to areas where sufficient clearances allow unimpeded pedestrian circulation when the rack is in use (see the Appendix C for the *CityRacks* siting guidelines).

Racks are never installed on sidewalks less than 10'-0" wide. This requirement, while necessary, severely limits the number of eligible locations, particularly in midtown and lower Manhattan, where daytime pedestrian volumes on local sidewalks often exceed capacity.

While a comprehensive study should be undertaken to identify locations in midtown and lower Manhattan where *CityRacks* may be placed, it is anticipated that an insufficient number of locations will be identified to fully satisfy demand. The creation of new space for bicycle parking should, therefore, be investigated.

Widened sidewalks, at both mid-block and end-block locations, could provide the room needed on crowded city sidewalks to install bicycle racks by replacing a limited amount of automobile parking space (see figures 1-8).

The widening of a sidewalk at the end of a city block should be accompanied by the widening of the sidewalk at the crosswalk as well. Intersections with particularly busy pedestrian crosswalks should, therefore, be given preference when choosing a location. By extending the widened sidewalk further down the block away from the crosswalk, space is created where bicycle parking and/or other street furniture and amenities may be located (see figures 2,8).

Sidewalk extensions at either mid-block or end-block locations should be designed to extend into the street no more than the width of the adjacent parking lane so as not to impede traffic. The length of the sidewalk extension may vary depending on the number of bicycles to be stored and whether or not other amenities such as telephone booths, news stands, trash receptacles, planters or benches, are also desired in the same location. The shape of the sidewalk extensions should be such that street sweeping vehicles will not have difficulty maneuvering around them.

In an effort to keep the cost of constructing such sidewalk extensions to a minimum, priority should be given to locations that do not require the reconstruction of drainage structures or the relocation of fire hydrants. Additional siting guidelines should be developed to ensure that racks are not placed directly opposite either the main or the service entrances to buildings.

Shelter - Presumably, although *CityRacks* do get used to a certain extent by individuals who commute to work by bike and store their bike at the rack all day, the City's high rate of bicycle theft combined with the racks lack of protection from the weather, renders them best suited to trips of relatively short duration made on relatively inexpensive bicycles.

New York City Bus Shelter

A shelter, such as that found at many of New York City's bus stops, would serve several functions that would improve on-street parking facilities viability for long-term bicycle parking needs. It would protect the bicycle from weather and could raise public awareness of bicycle commuting as a viable alternative to automobile use.

Increased public awareness could deter theft and vandalism. A security camera installed in the shelter could also be monitored by an adjacent building's security guard at his/her desk. Further, the cost of on-going maintenance of the shelter could be off-set by revenue earned from the display of advertising Design and construction of such a shelter should be coordinated with the mayors proposal for citywide installation of a uniform street furniture package.

Shelters should be constructed in conjunction with the extension of curbs (previously described). The design and placement of shelters at end-block locations, however, should be such that the motorists view of the intersection is not blocked, this may be accomplished by leaving off the end (side) panel of the shelter on the side nearest the crosswalk.

Business Improvement Districts

Certain Business Improvement Districts (BID's) have become active in providing amenities on sidewalks and in parks and plaza's within their boundaries. Their efforts are designed not only to make the pedestrian environment safer, cleaner and more aesthetically pleasing but also to create a recognizable identity for their district, one that will hopefully increase economic development.

Typical improvements implemented by Manhattan BID's include decorative sidewalk pavement treatments, improved lighting with distinctive light fixtures and other distinctive street furniture items such as trash receptacles, newspaper vending boxes, sign posts and signs, benches and planters.

With the exception of the Grand Central Partnership, the BID for the district surrounding Grand Central Terminal, and the 34th Street BID, no other BID's south of 59th Street have installed on-street bicycle racks. Fortunately, however, as shown in the *Existing Conditions* section, DOT's *CityRacks* program has installed racks in locations that fall within the various Manhattan BID district boundaries.

Grand Central Partnership Bike Rack

As various BID's come forward with proposals to improve their pedestrian environments, they should be encouraged by CDOT and/or the New York City Arts Commission to follow the example set by the Grand Central Partnership and 34th Street BID and include distinctive bicycle racks as a part of an integrated street furniture package.

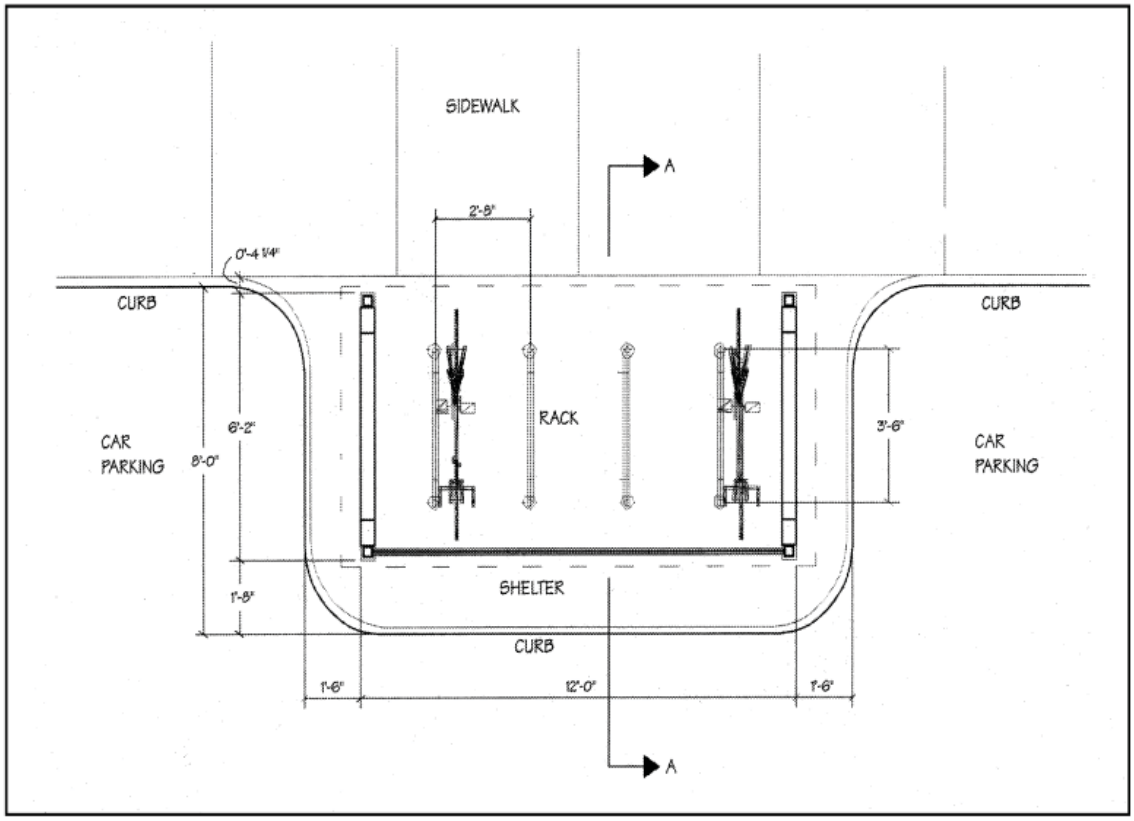


Figure 1 - Plan of Proposed Mid-Block Curb Extension with Sheltered Bicycle Parking

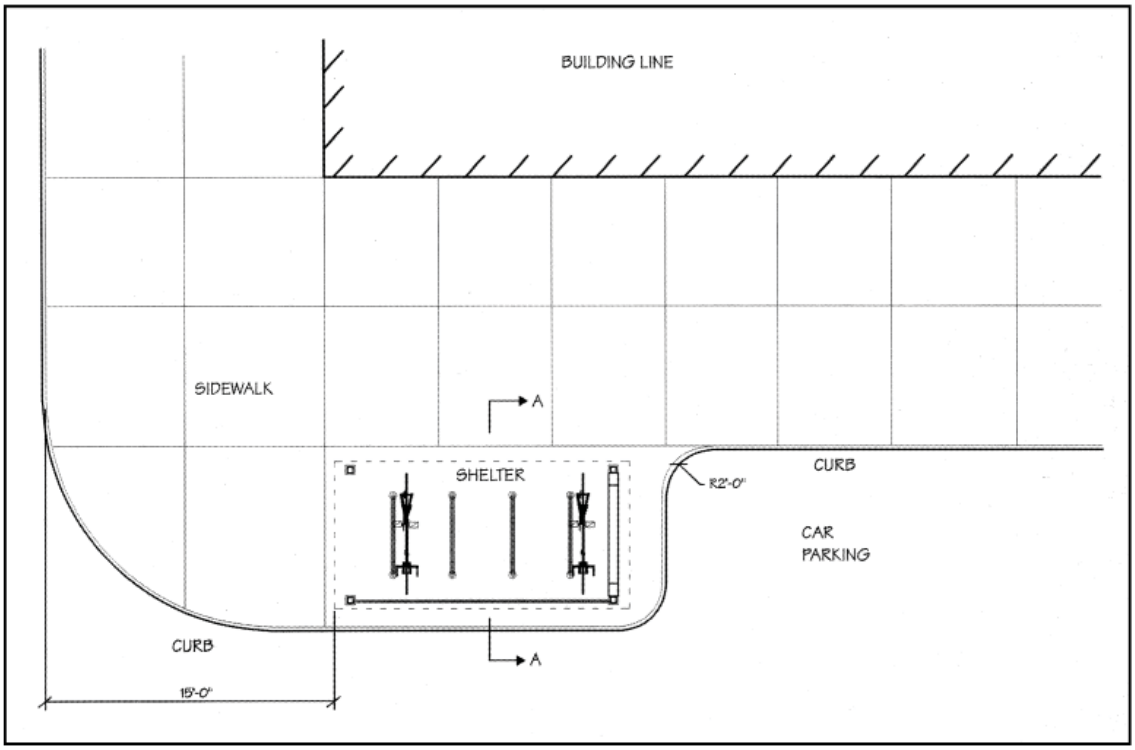


Figure 2 - Plan of Proposed End-Block Curb Extension with Sheltered Bicycle Parking

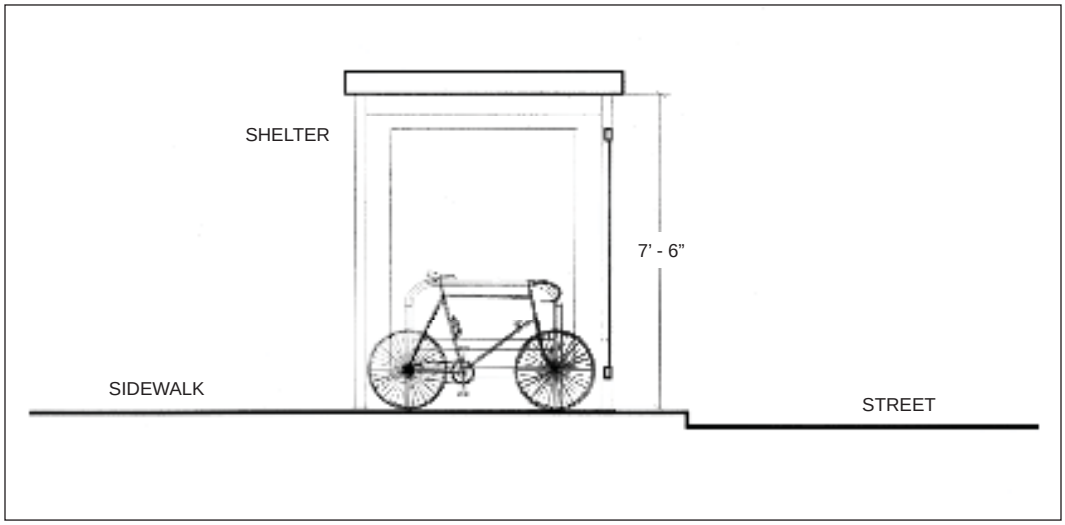


Figure 3 - *Section Through Proposed Curb Extension with Sheltered Bicycle Parking*

Figure 4 - *View of Proposed Mid-Block Curb Extension with Bicycle Parking*

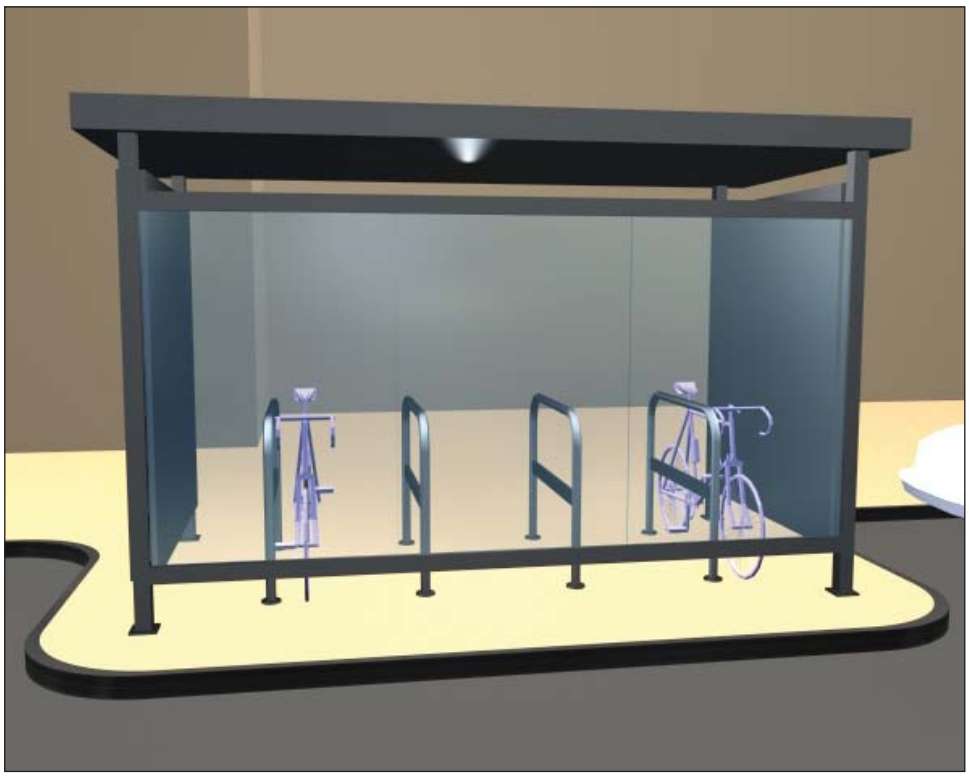


Figure 5 - *View of Mid-Block Curb Extension with Sheltered Bicycle Parking*

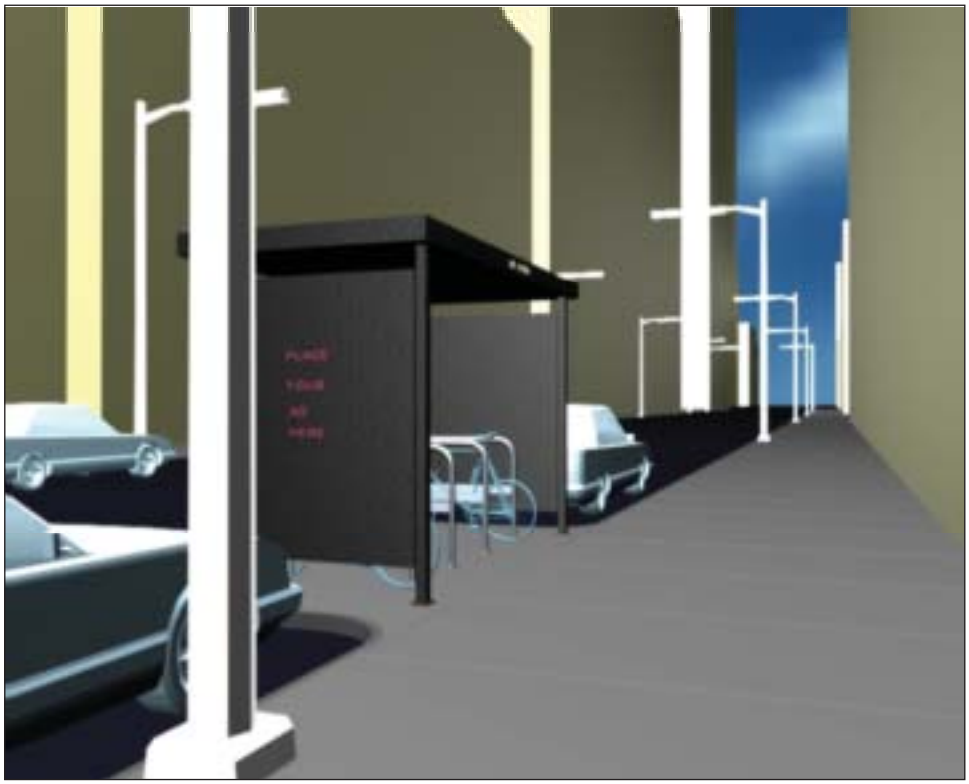


Figure 6 - *View of Mid-Block Curb Extension with Sheltered Bicycle Parking*

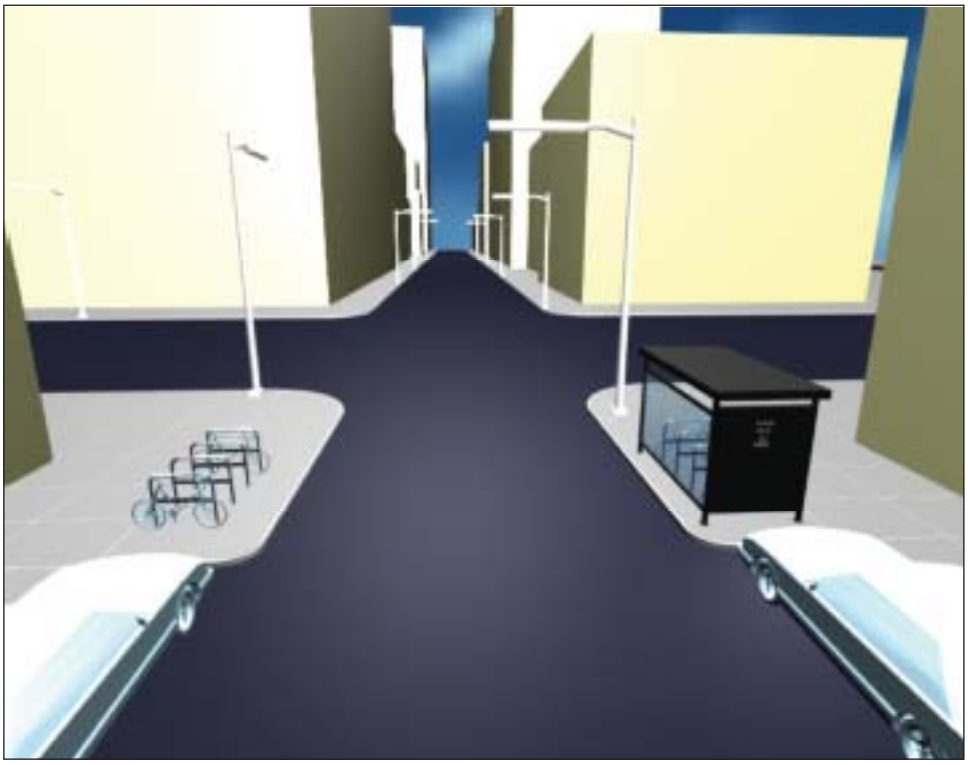


Figure 7 - *View of Mid-Block Curb Extension with and without Sheltered Bicycle Parking*

Figure 8 - *View of Mid-Block Curb Extension with and without Sheltered Bicycle Parking*

BICYCLE LOCKERS

Introduction

Bicycle lockers are becoming more and more popular in towns and cities across the country as a means of providing bicycle parking that offers a higher degree of protection against theft, vandalism and the weather than that afforded by typical on-street bicycle racks.

Bicycle lockers are usually constructed of metal and/or high strength plastic resin and are typically leased to individuals for a set amount of time that may vary from one month to a year. Most of the existing locker programs surveyed (see Appendix A, *Literature Review*) are located at transit hubs in order to facilitate an intermodal connection between bike and transit.

Concerns which need to be addressed when planning a locker program include:

- Who should pay for the initial installation of the lockers and on who's property should they be installed?
- Who should manage the program?
- What is the appropriate number of lockers at different locations?
- Which locker brand shall be chosen?
- What are the yearly maintenance and operating costs?
- What is the maximum fee lockers can be leased for, to what extent does that cover the programs anticipated operating costs?
- What kind of income can be generated from advertisements placed on the lockers?
- What kind of promotion for the lockers will be successful, what would such a promotional campaign cost?
- How to deal with underutilization (locker-holder uses it only rarely), especially at waiting-list locations?
- How to prevent lockers from being used to store things other than bikes?

Four locker programs at transit stations, which serve as examples of how such a program could be organized and managed at the New York City transit hubs are presented below (see Appendix G for a summary table).

New Jersey Transit (NJT), New Jersey

In response to public request, NJT has installed approximately 105 lockers at 15 different stations with a maximum of 60 lockers at one station. The majority of funding for purchase and installation came from the Inter-modal Surface Transportation Efficiency Act. The lockers were installed primarily on NJT property, though some were also installed at municipal park and ride lots. Along with the lockers, bike racks were also installed to provide the option of free parking. The location and the number of installed lockers were based on questionnaires collected by bike groups and by counting the number of bikes chained to street furniture at different stations. The locker brand currently in use, Cycle Safe, was chosen to replace original, lower quality lockers.

To encourage use in the beginning of the program, lockers were leased for free, with only a $25 key deposit. Users currently pay a monthly fee of $7.50 plus the key deposit. No discount is offered for long-term leases. The rental fee was calculated by comparing how many lockers could fit on an automobile parking space with a certain parking fee. Today a little over 50% of the lockers are leased, though at some stations all lockers are in use and waiting lists exist. Recently, however, an NJT survey showed, that on a good day, only 20-30% of all leased lockers were actually in use.

The lockers were installed and are maintained by the NJT Engineering Department. NJT is currently negotiating with the Transportation Management Authorities (TMA's) of the different counties in which the lockers exist to turn over the responsibility of managing the leasing and maintenance of the lockers.

The implementation of the locker program was not accompanied by any form of public outreach or promotion campaign; the program's only form of advertising is a sign attached to each locker unit providing the phone number to call for renting lockers. Calls are directed to a hotline, and if lockers are available at the requested location, a standard leasing form is mailed (see Appendix G for a sample of the standard leasing form). NJT estimates the time for managing the leasing and maintenance for all 105 lockers at about one workday per month. NJT did point out, however, that running the locker program requires subsidy; the major goals of NJT's locker program are to promote transit ridership and establish good public relations.

Washington Metropolitan Area Transit Authority (WMATA), Washington D.C.

WMATA has been running a locker program since 1981. Since then, over 600 lockers have been installed. WMATA plans to increase this number to 750 lockers by the end of 1999. The purchase of the locker is funded in part by ISTEA with the balance being paid for by WMATA. The lockers are installed on WMATA property only, primarily at suburban transit stations, only a few are installed in the downtown area. The number of lockers at each station varies from four to forty. Different brands are chosen, depending on indoor or outdoor installation of the lockers.

Lockers are leased for a fee of $70 per year plus a $10 key deposit. It is also possible to rent for only 6 months for a fee of $45. The rental fees are the same as when the locker program began in 1981. System wide, approximately 60% of the lockers are leased. At certain stations all lockers are rented and waiting lists exist. WMATA noted that the stations with waiting lists tend to be the ones that are easily accessible by safe, convenient bike routes.

WMATA does not put any signs with phone numbers on the locker. The reason given was that many locker users expressed concerned that a sign saying 'bike locker' might encourage thieves. Instead, the locker program is advertised on the WMATA website and in brochures. When the program was new, it was promoted through information printed on the back of farecards and on posters placed throughout the Metrorail system.

WMATA manages the locker program itself and estimates the time required to administer the leases and attend to necessary maintenance at about one workday per week for all lockers. WMATA estimates that maintenance costs are more or less covered by the leasing income, while time spent managing the administrative aspects of the program time may not be. As with NJT, the major goals are to promote transit ridership and establish good public relations.

Peninsula Corridor Joint Power Board (JPB CalTrain), California

The California Transit Authority (JPB CalTrain) administrates a locker program with 550 lockers, located at 20 stations in and around San Francisco. The purchase was funded by the California State Department of Transportation and by federal grants. In a few cases, the local municipality bought and installed the lockers at their local transit stop using ISTEA funding and then turned them over to JPB CalTrain for management. JPB CalTrain plans to purchase another 200 to 250 lockers for replacement and new-installation in the next year.

The lockers are installed on JPB CalTrain property only. In some cases, car parking spaces were used for the installation. Lockers are placed in groups that range in size from a minimum of at least 8 lockers, up to 100 lockers at one station. Different brands are in use including Cycle Safe and most recently, BikeLid lockers. JPB CalTrain believes the BikeLid offers a comparable level of security to the Cycle Safe locker, but for a cost per unit that is $600 less.

Lockers are leased in half-calender year cycles for $5 per month plus a $25 key deposit. While the cost is low compared to other locker programs surveyed, it was pointed out by JPB CalTrain that the monthly fee for car parking at the same train stations is just $10. The response to the program is very good, approximately 80% of the lockers are leased, with waiting lists at many stations including the station with 100 lockers. At high-demand locations, commuters must sometimes wait up to a full year for a locker to become available. The turnover of lockers is around 20% per year. Lockers are checked twice a year, though there is no mechanism in place to terminate the leasing contract if lockers are not in use.

Beside stickers on the lockers themselves that provide a phone number to contact, the program is occasionally advertised in CalTrain's monthly newsletter and in brochures that get handed out in trains. The time for office and field work was estimated at approximately half of a workday. Though no empirical analysis has been done, CalTrain believes the leasing income more or less covers the management/ maintenance costs.

The San Francisco Department of Parking and Traffic, San Francisco, Ca.

The San Francisco Department of Parking and Traffic (SFDPT) also manages a locker program with approximately 100 Cycle-Safe lockers. The program started in 1995 and was funded with state grants. Lockers are located throughout the city, including 14 lockers at the main bus station and 8 lockers in a parking garage near a popular subway station. At both locations, all lockers are in use, with waiting lists in attendance. Lockers are leased for $25 for 3 months, $45 for 6 months, and $75 for one year. The key deposit is $25.

In the beginning, the program was advertised in major newspapers and on flyers handed out in the general vicinity of proposed locker locations. Today, most public inquiries result from informational stickers placed on the lockers. The response is very good; approximately 90% of the lockers are in use. SFDPT estimates that the managing of the entire locker program requires approximately 3 days per week. The amount of time required to administer the program is considered a liability by SFDPT because their is no specific full-time person within the department who is assigned to this job. The employee-hours however are said to be covered by the leasing income.

Summary

Each of the locker programs surveyed offer long term leases and require key deposits. High quality, vandal proof lockers that completely enclose a bicycle are comparable, in terms of convenience and security, to automobile parking in a manned parking garage. For regular commuters, user-assigned lockers offer the advantage of guaranteed secure parking.

Coin-operated doors or lockers with hasps and staples for user supplied locks have proven easier targets for break-ins and vandalism, while an assigned key lock system under rental terms provides better utilization and control over user access.

Most of the existing locker programs are partly funded by state or federal aid programs. 80 to 95% of the cost to purchase and install bicycle lockers is eligible for reimbursement under several programs contained within the Transportation Equity Act for the 21st Century (TEA-21). While the funding may not be used for on-going maintenance of the lockers, the availability of subsidy for purchase and installation encourages the purchase of more expensive high quality/low-maintenance lockers. A locker that uses high strength material for the body and frame of the locker and a surface that allows easy removal of graffiti is recommended.

Programs at transit stations are mostly initiated and administered by transit authorities and are mostly installed on their own property, sometimes also on municipal parking lots. In the San Francisco case, the city also provides lockers at select subway stations in the city-center and at the major bus station.

A frequent obstacle to implementing locker programs is the dedication of staff time to on-going administration and maintenance tasks. In all cases, the time required to perform such tasks has not necessitated a full-time person. Rather, the responsibility has typically been added to an existing employees list of responsibilities. The large programs at WMATA and JPB CalTrain are, however, to be enlarged further. As programs increase in size, they may require a dedicated person in charge.

Administration costs can be reduced by leasing lockers on a long-term basis. Leasing contracts for lockers in the surveyed programs are signed from one month up to a year and always include information about rental payments, permissible and non permissible uses, an agreement for inspecting the locker and the right to terminate the contract if things other than bikes and bike related equipment are stored. Other signed agreements absolve locker providers of liability for injury, theft, loss or damage.

Yearly rental fees do not exceed $100. WMATA's program manager stated that there are on-going discussions to raise their $70 per year fee. Lease income should be evaluated in the context of low fees resulting in high use versus high fees resulting in low use. Factors that should influence the decision include fees for transportation alternatives including public transit, car parking fees around the transit stations and the number of suitable cycling-months depending on climate.

None of the locker programs report full use of all lockers. Both San Francisco programs are leasing 80-90% of their lockers, the others reported just 50-60% occupancy. Nonetheless, each of the programs has locations with 100% occupancy and more commuters waiting to rent. Lockers from less frequented locations could be easily moved to high-demand locations. The JPB CalTrain program performed a test in which they installed one set of lockers on top of the first at the IRS station in San Francisco where available space was severely limited. Despite the inconvenience of having to lift ones bicycle up and into the above locker, all the lockers are occupied.

Proposal for a Prototypical Installation at a New York City Transit Hub

In the Department's *Bicycle Questionnaire*, respondents were asked *"Where would you like racks, lockers, etc.?"* Lockers were the type of parking facility most frequently requested at the three major transit hubs in Manhattan (Port Authority Bus Terminal, Grand Central Station, Pennsylvania Station). The category, 'Transit Hubs' was the second most frequently identified location category after 'Parks' (see *Existing Conditions* section for a more detailed description of the survey results).

Bicycle Parked at Grand Central Station

The MTA and the Grand Central Partnership could install bicycle lockers within Grand Central Station in a portion of the building conveniently accessible to the public. Similarly, Amtrak could install lockers at the current Pennsylvania Station as a test for a more comprehensive facility at the new Pennsylvania Station. The same recommendation applies to the PANYNJ for The Port Authority Bus Terminal. (see Appendix G for specifications for exemplary locker installation)

Three user groups can benefit from long-term bike parking facilities located at major transit hubs in Manhattan: New York City residents who ride to a station to take a train/bus for their commute to work and/or other destinations outside the city; commuters who come by train/bus into Manhattan from outside the city and wish to cycle from the station to their final destination; and cyclists who commute on a regular basis by bicycle from elsewhere within the city to a destination within walking distance of the transit hub.

Bike lockers, like other transportation services, should rely on user charges for facility development and operation. The principle of self-support through both parking fee and advertising revenues should be applied to the maximum extent possible. Good public relations along with environmental and health benefits must also be taken into account when considering the cost-benefit ratio of implementing and operating such a program.

Respondents to the Department's *Bicycle Questionnaire* stated they would be willing to pay an average of $4.34/day for secure bike parking. For lockers at New York City transit hubs, however, the fee should not exceed the$3/day cost for commuting by mass transit.
Monthly or yearly parking fees should not be calculated as a direct multiple of a daily sum. $100 per year in the locker programs described above did not, in most cases, cover the administration costs for the program.

Automobile parking costs could be considered in determining bicycle parking fees. Another

possible criteria is the relative value of the item being parked and stored; bicycles used for commuting purposes may range in value from $50 to $5000. Fees for NYC could be priced higher than the programs described above, particularly when one considers the cost of automobile parking in Manhattan. For example, private automobile owners pay parking fees of around $480 per month in the Grand Central Garage. Recommended is a locker user fee of $15 per month. This calculates to just $0.71 per day based on a 21 work-days month. Because of seasonal disadvantages, this fee should be lowered for longer leases, e.g. $75 per half year and $125 per year. The key deposit should not be less than $25, to cover repair costs and to motivate key returning after the lease expires. While these fees may appear low, they range from 38% to 50% higher (yearly) than fees charged by the programs in other cities described above.

A marketing campaign should accompany the implementation of a locker program. Initial forms of advertisement should include posters and flyers in the transit stations, buses, trains and in bike shops, information printed directly on farecards and advertisements placed in local newspapers, the newsletters of bike clubs and advocacy groups, and local radio. Continuous marketing of the service will be necessary to attract, retain and expand the bike parking facility.

A successful locker program is easily expanded into a more comprehensive facility offering a variety of types of bicycle parking and other related services such as repairs, rentals and merchandise sales. See page 19, The “Bike-Station” concept for more information.

THE BIKE STATION CONCEPT

Introduction

The bike station concept, still new to the Unites States but quickly gaining in popularity, is an attended centralized location where commuting cyclists can, at a minimum, leave their bicycles for either a short amount of time, or overnight. Other features commonly found at bike stations include shower and change facilities, coffee/snack stand, repair station with mechanic, cyclist's boutique, tourist information (maps, etc.) and bicycle rental concession.

To date, the bike station concept has been combined with transit hubs, such as railroad stations, to facilitate an inter-modal connection. While this is a logical application of the idea, the bike station concept may be successfully employed in a variety of situations, depending on the services offered.

The bike station concept and, in particular, the Long Beach, California *Bikestation*™ were briefly described in the *Literature Review* (Appendix A) of this study. Following is more detailed information about this and other supervised bicycle parking facilities.

Long Beach, California

The Long Beach *Bikestation* opened in March of 1996 as the first and only facility of its kind in the United States. The station consists of a corrugated metal modular building and a sheltered outdoor bike parking area. Construction of the facility cost $125,000. The station is located in a corner of a parking lot on the transit mall in downtown Long Beach. It provides access to shopping, restaurants, hotels and offices in Long Beach as well as the Metro Blue Line Light Rail which serves downtown Los Angeles. When the station opened in 1996, it parked about 300 bicycles per month.

Currently the station parks between 1500 and 1700 cycles per month. The facility offers free valet bicycle parking for up to 150 bicycles, low-cost bike rentals for commuters, market rate bicycle repair and tuning, a retail shop with bicycle accessories, a restroom and changing area, a coffee bar and patio, information about transit service and bicycling routes, safety and maintenance classes, a commuter bike club, free Cycle-Safe lockers for bicycle parking when the station is closed, and special promotions with area businesses.

The station was constructed using a grant from the CMAQ program of ISTEA. The salaries of station employees, marketing and operational costs are paid for in equal shares by the City of Long Beach and the Los Angeles County Metropolitan Transportation Authority (LACMTA).

Chatsworth, California

In May 1998 the Chatsworth Depot Bike Stop was the second attended bicycle parking station to be opened in the Los Angeles area. It is located at the Chatsworth Intermodal Transportation Center, a train and bus station.

A public/private partnership, the Chatsworth Depot Bike Stop is funded by a grant from the LACMTA and the Los Angeles Department of Transportation. The 12th Council District Transportation Management Association, a private, non-profit organization provides project management and marketing/outreach services to LADOT for the project. Tri-Valley Bicycle Club, Inc. and its local store, Chatsworth Cyclery, staff and operate the facility. Additional support for the Bike Stop project is granted by GT Bicycles and Charger Electric Bicycles.

The facility provides bicycle parking and storage, changing rooms with lockers, bicycle sales, rentals and repairs, bicycle and transit route information, coffee, snacks, and bicycle

accessories. Bicycle storage and parking are free to all Metro-link passengers using the station to transfer to or from their train. Of the 30 bicycle lockers on site, 12 are reserved for day use only, for commuters who may be arriving/departing before or after the opening hours of the Bike Stop. The other bicycle lockers are available to commuters on a yearly basis and a refundable key deposit is required.

The implementation and operating costs for the Bike Stop served as a model for projecting the estimated budget needed to open and operate a similar facility in Palo Alto.

Palo Alto, California

The Palo Alto *Bikestation*™ is the second station to be implemented by Bikeable Communities, the nonprofit corporation that organized and initially ran the Long Beach *Bikestation* and has since trademarked the name. In order to gain permission to use the *Bikestation* name from Bikeable Communities, free attended bike parking is required. The Palo Alto Station is scheduled to open on April 9, 1999 in a building at the Palo Alto CALTRANS station which was formerly used for baggage handling.

About 1700 commuters board trains in Palo Alto each weekday to reach jobs in San Jose and San Francisco. The *Bikestation* is being opened to reduce the danger and inconvenience associated with the high number of bikes on trains. Currently about 20% of CALTRANS passengers take their bikes with them. The *Bikestation* will also provide a safe storage area for low-wage workers employed in Palo Alto, who currently have very few places to lock their bikes.

Although the City of Palo Alto only allotted 1500 square feet in the historic building, the *Bikestation* will take advantage of its 21' high ceilings to accommodate bicycle parking and other services. The Bay Area Air Quality Management District granted $127,000 and the city of Palo Alto contributed an additional $44,000 to renovate the structure and operate the facility for the first 18 months.

The facility will be operated by Palo Alto Bicycles, a local bicycle shop. The shop is required to provide free attended bike parking for at least 150 bicycles. To accommodate the required number of cycles and possibly more, an engineer is designing inexpensive space-saving racks for the facility. Two employees will be on duty whenever the *Bikestation* is open with one employee possibly being a participant in the HOPE adult rehabilitation project, thereby receiving a state wage subsidy.

The manager of Palo Alto Bicycles hopes that the shop will make a profit from the venture. Any costs not associated with bicycle parking will be paid by Palo Alto Bicycles, and any revenues from services or retail are theirs to keep. Even if *Bikestation* is not profitable, Palo Alto Bicycles believes that the publicity generated will indirectly bolster business at their main shop.

Planned services include, free attended parking, changing facilities, transit and bicycle route information and market rate bicycle rentals and repairs. The sale of commuter oriented bicycle accessories and coffee and snacks may be added after the station opens.

Pittsburgh, Pennsylvania

A bike station is currently in the planning stages for Pittsburgh. Port Authority Transit (PAT) of Pittsburgh has commissioned Bikeable Communities to conduct a feasibility study at a cost of $30,000. PAT expects the station to cost about $500,000 to construct and about $50,000 to operate annually. PAT plans to locate the station in an area where commuters can board public transit to complete their trip.

Seattle, Washington

Seattle has applied for a TEA-21 grant that would help them to open the most extensive bike station network in the United States. Four bicycle parking stations are proposed to be built in conjunction with a new regional light rail system.

A cooperative of representatives of the City of Seattle, King County, the City of Tacoma, the City of Everett, and several transit providers in the greater Seattle area plan to open the stations in an effort to reduce automobile congestion in the Seattle area and regionalize bike-transit services which began in Seattle in 1972. The bike stations will provide seamless bike to transit connections, enticing both people who drive to transit and drive to work to consider biking as a more convenient alternative.

The cooperative plans to expand the system by adding five to ten more stations after the first four have been successfully installed. Three of the stations are planned for stops on the new regional light rail, one in Tacoma, one in Everett, and one in Seattle. A station is also planned for the Evergreen Point Bridge, near the University of Washington campus, to ease the overcrowding on the very successful bike-on-bus program on buses entering Seattle.

The stations are intended to serve as a promotional tool for the transit agencies and the cities involved, and initial operations will receive full operational subsidy. Each station will be managed by its host transit agency and city. Station operation may be contracted out to the Bicycle Alliance of Washington, a cycling advocacy group which has provided bike parking services on a limited basis.

Each station will provide free staffed bike parking and extensive transit and cycling information with the possibility of adding other services such as repairs, rentals, snacks, and changing facilities as demand dictates. The stations may become independent in the future and additional franchises may be sold to local merchants if the program proves successful. The respective transit agencies do not intend to cover bike station costs with service and retail revenue, but expect that the success of the stations will ensure a reduction in their costs associated with providing automobile parking and mitigation to the community.

Some facilities will be located within existing transit structures, but most will be stand alone buildings in order to draw public attention and create awareness of the new facility. The stations will have an initial capacity of 150-200 cycles and the cooperative expects the stations to help Seattle reach its goal of having 20% of transit riders cycle to transit. Projected costs of construction and operation have not yet been calculated, although 5% of the budget has been allotted for promotion of the new facilities.

Proposal for a Prototypical "Bike Station" Installation in New York City

The Bicycle Questionnaire asked participants, *'Where would you like to see racks, lockers or a bicycle station installed?'* Over 30% of the responses were recommendations for service stations (lockers, comprised approximately 23% of the responses).

The sites that received the highest number of recommendations for bike stations were parks, with Central Park and Battery Park being the two most commonly recommended Manhattan sites. Grand Central Terminal, Penn Station and Union Square were the next three most common recommendations. Respondents also recommended stations in different work destinations in the city, including Wall Street and the World Trade Center.

Well Used CityRack at World Trade Center

The bike station concept, although attractive to recreational cyclists (rentals, repairs, a place to store one's bike while visiting the park, etc.), is proposed, in the context of this study, to encourage bicycle commuting to work. A bike station located in a park is not likely to serve a cyclist commuting to work as well as a bike station located at a transit hub or nearby to a concentration of jobs. The locations identified in this report for the implementation of such a facility have been chosen to encourage bicycle commuting.

Problems and concerns that need to be addressed when planning a bike station are:

- Where should the station be located?
- On whose property will the station be placed?
- Who will manage the station?
- What type of structure will be used or constructed?
- What is the appropriate capacity of the bike station?
- What services should the facility provide in addition to secure parking?
- How much money will be needed for yearly operation of the facility?
- How much will be charged for the bicycle parking and other services of the facility? (Bike stations in the US and abroad typically provide free parking to encourage bicycle commuting, but charge for their other services.)
- How much and what type of advertising and promotion will be required to ensure the success of the station?

Each of the existing bike stations profiled above are located at or near to a commuter transit station in order to encourage inter-modal transit into the central business districts (CBD). This sort of implementation certainly has application both in New York City at the major transit hubs that serve the CBD (Grand Central Station, Pennsylvania Station and Port Authority Bus Terminal) and also at many of the outlying transit stops that serve surrounding suburban communities.

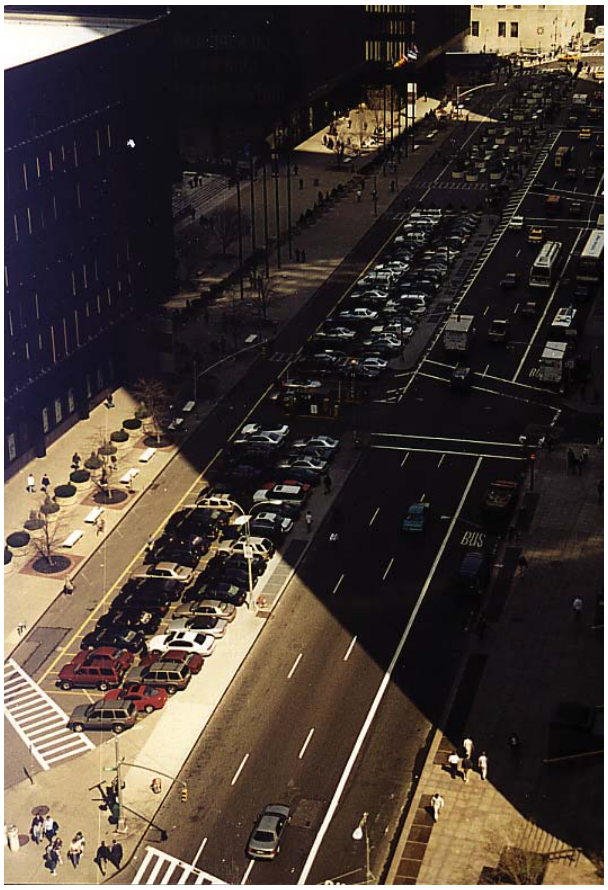
Bike Stations at outlying rail stations may be used by individuals that ride back and forth between home and the rail station. Bike stations at the major transit hubs may be used by people who would otherwise travel from the transit

hub to work by private car. Bike stations located elsewhere within the CBD, away from the transit hubs but near to areas of high employment would primarily attract people who ride directly to work but could also serve commuters who have arrived at one of the major transit hubs, picked up their bicycle which they keep stored at the bike station there and ridden to their place of employment. With the presence of bike stations at all of these locations, the most determined of bicycle commuters could conceivably make use of two separate bicycles and three bike stations on each one way trip between home and the workplace.

Wall Street and South Street Location

In addition to the transit hubs, sites in Manhattan south of 59th Street recommended for the location of a bike station are Wall Street near its terminus at South Street, Church Street directly in front of the World Trade Center complex, the small triangular lot owned by the MTA on the south side of Houston Street between Broadway and Crosby Street, and the Union Square area, favored the traffic triangle at the southeast corner of the Park, owned by the Department of Parks and Recreation and currently being reconstructed by the MTA.

The first two of these locations (Wall Street @ south Street, Church Street/WTC) are chosen for their proximity to large employment centers in lower Manhattan but may require the displacement of a small amount of existing automobile parking.



World Trade Center Location

The second two locations (Broadway/Houston and Union Square Park) are convenient to the neighborhoods of Greenwhich Village and SoHo and are directly adjacent to major subway stations. The colleges and universities, businesses and many tourists in this part of the city contribute to a more relaxed atmosphere in which less emphasis is placed on dress code than in lower Manhattan with its abundance of large class A office buildings.

Individuals who work in this district, by virtue of their more casual dress, are likely to be more willing to ride bicycles to work.

Union Square Southeast Triangle Location

The implementation of a bike station at the Union Square site will require the alteration of a design the Parks Department has developed for the site to be implemented upon the completion of the MTA work. The 'Parks' design calls for most of the triangular site to be 'green'.

Depending on the size of the bike station, its implementation at the Houston Street site may require the demolition of a small building that fronts on Crosby Street, although this building may also be incorporated into the design for the bike station as a money saving measure. Also, MTA's current use of the site to park maintenance vehicles may need to be modified or suspended.

While commuters are expected to use the bulk of the parking in the proposed stations, a certain amount of space should be reserved for short term, high turnover parking as well. Bike messengers and other cyclists using the facility would benefit by having convenient access to repair services in lower Manhattan.

High volumes of messenger traffic throughout the day as well as regular passing foot traffic provide the possibility of a thriving service and retail component to any station located within the CBD. In each of the mentioned locations, a concessionaire should be identi-fied to rent bicycles to take advantage of the booming tourist industry in New York City.

In addition to capturing the tourist market, other bike stations use rental bikes to encourage bike commuting The Long Beach Bikestation offers commuter rentals at below market rates as well as mountain and road bike rentals for recreation at market rates. Such a rental program could help a New York bike station to encourage bicycle commuting and be self-sufficient, but would require additional space which may not be possible in all locations.

Under TEA-21, construction costs for the station are eligible for reimbursement at between 80 and 95%, depending on which specific program is applied to for the funds. As this project is in keeping with the goals of TEA-21 and ISTEA, funding has been secured under each for the construction of similar facilities. To keep implementation costs low, the station be located on land provided by the city or other public agency such as the MTA or Port Authority.

Broadway and Houston Street Location

For each of the proposed bike stations, a task force should be formed to facilitate implementation.

The task force should select the most appropriate exact location, determine the entity that will be responsible for planning, designing and constructing the facility, choose the services that will initially be offered and develop an operation plan that identifies the entity or the entities that will run the various functions to be housed within the facility. All task forces should include representation from the bicycle retail industry to ensure that structural decisions regarding space allocations, hours of operation, are expertly addressed.

Proposed Bike Station Locations	**Task Force Representatives**
World Trade Center	**PANYNJ**, CDOT, MTA, Downtown Alliance, DCP
Wall Street at South Street	**CDOT**, DPR, DCP, Downtown Alliance
Union Square Southeast Corner	**DPR**, CDOT, MTA, 14th St-Union Square BID, DCP
Broadway at Houston	**MTA**, CDOT, NoHo NY BID, SoHo Partnership, DCP
Grand Central Station*	**MTA**, Grand Central Partnership, DCP
Pennsylvania Station*	**Amtrak**, MTA, NJT, Penn Station BID, 34th Street Partnership, DCP
Port Authority Bus Station*	**PANYNJ**, MTA, CDOT, DCP

Agencies in bold are recommended task force leaders.

* Bike Stations at the major transit hubs should be preceded by bicycle locker installation only as described in the section titled, “Bicycle Lockers” (see page 14).

LOCAL LAWS AND ORDINANCES

Introduction

Increasingly, cities across the United States are beginning to use Zoning Codes to require the provision of secure off-street bicycle parking facilities as part of new developments (see Appendix B for a summary). In most cases, bicycle parking is required as a component of a building's proposed accessory automobile parking facility. Some cities, however, are beginning to require the provision of secure bicycle parking inside the buildings themselves (exclusive of an attached or internal accessory parking garage). Such provisions are usually accompanied by local legislation mandating building access to persons with bicycles and, in San Francisco's case, an additional zoning requirement that showers and change facilities be provided as part of the new development.

The San Francisco Example

In 1995, the San Francisco Municipal Code (Planning Code) was amended to require the provision of secure off-street bicycle parking facilities in all city-owned and/or leased properties. The code defined/specified the following:

- Classifications of bicycle parking based on the level of security and weather protection afforded,
- criteria for siting a particular classification of bicycle parking,
- requirements regarding the location, layout and placement of bicycle parking facilities,
- requirements regarding the quantity of bicycle parking spaces,
- responsibility for providing and maintaining access to bicycle parking,
- time schedule for implementing required bicycle parking,
- charging of fees for bicycle parking,
- required advertisement of available bicycle parking in the form of signs, notices,
- enforcement of the Planning Code requirements,
- exemptions.

The code was again amended in November, 1998 to extend the bicycle parking requirement to include all privately-owned parking garages and to include a requirement for shower and locker facilities in new commercial and industrial buildings and new buildings undergoing major renovations.

Concurrent with these changes to the Planning Code, the Municipal Code (Administrative Code) was also amended to require monitored bicycle parking at large public events.

Recommended Changes to the New York City Zoning Resolution

The New York City Zoning Resolution controls development throughout the five boroughs of New York City, making it the most effective tool available for mandating the provision of specific requirements in conjunction with the development of both public or private property.

The City Planning Commission should amend the Zoning Resolution to require bicycle parking in conjunction with the construction and operation of all new, and continued operation of all existing, off-street parking facilities in Manhattan south of 96th Street.

According to data supplied by the NYC Department of Consumer Affairs (1999), there are 724 licensed public parking garages, 382 licensed public parking lots, and 10 combined (garage and lot) facilities in Manhattan south of 96th Street. The vast majority of these facilities (452 garages, 361 lots and 9 combined

facilities) are located south of 59th Street. If each of these facilities were required to provided 6 bicycle parking spaces, the recommended minimum, a total of 6,696 new bicycle parking spaces would be immediately created (4,932 south of 59th Street). Compliance with such a provision among all parking facilities, including accessory facilities, would result in the creation of even more secure, conveniently located off-street bicycle parking.

Such text revision could be modeled after the San Francisco example and written to address all the points mentioned above. Any amendment to the Zoning Resolution should, at a minimum, identify the class of bicycle parking facility and/or the type of bike rack required, the minimum number of bicycles to be accommodated and guidelines regarding placement of and access to said facilities.

Most cities in the United States, including New York City, require some amount of off-street automobile parking with the construction or substantial renovation of buildings. New York City, however, makes an exception to this rule for those portions of Manhattan contained within Community Districts 1-8 and small portions of Community Districts 1 and 2 in Queens where the construction of off-street automobile parking is severely restricted.

Community Districts 1-8 include all of Manhattan south of 96th Street, fully encompassing this project's targeted study area of midtown and lower Manhattan. Chapter 3 of the Zoning Resolution, *Comprehensive Off-Street Parking Regulations in Community Districts 1, 2, 3, 4, 5, 6, 7 and 8 in the Borough of Manhattan and a Portion of Community Districts 1 and 2 in the Borough of Queens*, defines the maximum amount of accessory off-street parking allowable, as-of-right, in Manhattan south of 96th Street and portions of Long Island City, Queens. Chapter 3 defines the requirements that must be met in order to exceed those limits including the procedures related to obtaining an authorization and/or a special permit.

Chapter 3 also states that the authorization of an operating licence for all proposed, or reauthorization of an operating licence for all existing, off-street public parking facilities is contingent upon meeting all the requirements set forth in Chapter 3. This last provision is especially important as it provides a means of bringing all existing public parking garages into compliance with any new requirements for bicycle parking.

Recommended Changes to the New York City Administrative Code

New York City Council member Adolfo Carrion has drafted a proposed amendment to the New York City Administrative Code that would require building owners and managers to, "...make reasonable provisions to provide for access to such building by individuals with bicycles. Such reasonable provisions shall include the designation of freight or service elevators..." (For the complete text of the proposed amendment see Appendix F).

The proposed text has been forwarded by the Council members office to the New York City Building Owners and Managers Association (BOMA) for their review and comment. Pending the outcome of their discussions with the Association, the Council member's staff hopes to introduce the proposed legislation before the City Council sometime in late April, 1999.

The proposed legislation should be amended to include language that limit access to persons with bicycles to persons who live or work in the particular building effected.

As reported in the *Existing Conditions* section, policies regarding bicycle access to city owned/leased buildings vary from building to building. Therefore, in addition to City Council Member

Bicycle Parking in DCP - Transportation Division Office at 2 Lafayette Street, Manhattan

Carrion's proposed legislation, the City of New York Department of Citywide Administrative Services, Division of Real Estate Services (DCAS/DRES) should seek an amendment to the Administrative Code that would require bicycle access to City owned or leased buildings for municipal employees who work in those buildings. Storage of municipal employees' bicycles should either be permitted at, within or adjacent to a person's work space (office) or at a secure, designated bicycle parking area to be provided by either the owner of or the managing agent for the building.

Bicycle Rack in the Basement of CDOT Headquarters at 40 Worth Street, Manhattan

As with the proposed amendments to the Zoning Resolution described above, any amendment to the Administrative Code should include guidelines that, at a minimum, identify the class of bicycle parking facility and/or the type of bike rack required, the minimum number of bicycles to be accommodated and appropriate means of providing access to said facilities.

ENCOURAGEMENT

Public Outreach Campaign

In order to expand bicycle parking opportunities throughout the city, CDOT should undertake a comprehensive public outreach campaign designed to encourage private property owners of all descriptions to provide safe, secure off-street bicycle parking facilities.

During the preparation of the *Existing Conditions* report, informational telephone interviews were conducted with numerous parking garage and building owners and managers. The interviews were conducted as part of an informal survey designed to determine the general attitude among the companies and individuals responsible for the maintenance and operation of such facilities towards the provision of indoor off-street bicycle parking. Two major concerns emerged (see, *Existing Conditions* report for more detailed information):

First, was concern that the placement of bicycle racks inside a building may constitute a fire hazard and building code violation, and thus, would subject the property owner to fines and/or summonses from the Fire Department and/or the Department of Buildings.

Second, owners/managers of both private and City owned buildings were concerned about liability resulting from injury to persons or their property as a result of the presence of bicycles in a building, including a fear that other persons business clothing could become accidentally soiled by bicycle grease or bicycles could slip from their owners hands and bump and injure others, possibly resulting in claims against the building owner or manager for compensation. Additionally, owners and managers expressed concern over liability for the theft or vandalism of the bicycles themselves.

While many owners/managers of privately owned public parking garages were also concerned about liability for the theft of and/or vandalism to a bicycle stored in their garage, they were perhaps more concerned about liability for the safety of cyclists who could potentially be injured by motor vehicles while going to or returning from a rack located away from the entrance of the garage. With the proper precautions taken, however, bicycles can be safely and conveniently accommodated inside most buildings and garages.

Project staff contacted the Fire Department, the Department of Buildings, and several insurance companies that write liability policies for large office buildings to determine what concerns they have regarding the provision of bicycle parking facilities inside buildings and what policies existed to address those concerns. The New York City Department of Buildings stated that, because bicycles emit no exhaust and are not flammable, they are not considered to be hazardous. As a result, there is no need to include restrictions against indoor bicycle parking in the Building Code. Minimum widths are, however, required for hallways and the Code includes a passage that states that hallways should be kept free and not be used as storage space. Storage of bicycles in designated rooms is permissible; bicycle racks installed in a lobby would have to be located to the satisfaction of the Fire Inspector. The Building Code contains no written requirements or guidelines about how to design bike parking spaces inside of buildings.

Information from the DOB interview was confirmed in conversations held with representatives of the Fire Department, Bureau of Fire Prevention. Parking bicycles inside a building in designated areas is not a problem as long as hallways are kept free for evacuation purposes. Several insurance companies that provide insurance policies for commercial buildings were also contacted. Representatives of each denied that the presence of bicycle parking located indoors would effect the policy in any way.

A properly designed encouragement campaign should include an accurate description of the Fire Department's and the Department of Building's policy (or lack thereof) and the insurance industries position regarding the presence of bicycle parking facilities in buildings as described above.

The encouragement campaign should recommend that building owners start by surveying their tenants to determine whether or not demand exists for indoor bicycle parking facilities. The survey should communicate directly with individual employees. Company representatives may answer that they do not want bicycles in their individual offices, potentially hiding the desire of employees within that company who would like bicycle parking at the workplace. In such cases, building management should look for a location elsewhere inside the building where secure, centralized bicycle parking can be established.

Once demand has been accurately estimated, the appropriate sized facility can be planned and necessary space requirements determined. Building owners could survey the building for ancillary spaces that may be large enough to accommodate the appropriate number of bicycles without encroaching on any of the areas designated as a means of egress (preserve minimum clearances in corridors and hallways as prescribed by the building code). In association with identifying potential locations within the building, consideration must be given to how cyclists will access the bicycle storage area. If access to the lobby and passenger elevators is to be prohibited all or part of the time, then the proposed bicycle parking facility needs to be located in a location(s) convenient to the building's service entrance and/or freight elevator.

Building owners/managers that decide to participate in such a program must also give consideration to the type of bicycle parking facility they are willing to install. Participants in the program need to be encouraged to provide the safest, most secure form of bicycle parking possible. Some form of limited access bicycle parking is the best approach. Placement of high quality lockers or some form of monitored or check-in facility are the ideal solutions for employees commuting to work. Another good solution is to make a secure (locked) room available solely for bicycle parking and install secure bicycle racks inside the room to which bicycles may be locked. Access to the room would be available by key only to cyclists making use of the room and building maintenance and security staff.

The encouragement campaign should point out resources available to building owners/managers who require assistance in carrying out all aspects of the program from surveying building tenants to determining the most suitable location, to designing the bicycle parking facility itself.

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APPENDIX A - LITERATURE REVIEW

LITERATURE REVIEW

OVERVIEW

The literature review reports on the status of bicycle parking planning, design and implementation efforts in both North American cities and international cities. Special attention is paid to innovative governmental policies, administrative support structures and technical solutions.

Resources

The most useful sources of information were the many local bicycle parking experts and bicycle program coordinators from both the U.S. and abroad that were contacted.

Additional material reviewed included:

- ***Several publications of the Federal Highway Administration (FHWA)/U.S. Department of Transportation (U.S.DOT).***

- ***Non-governmental publications, such as the* Bicycle Blueprint*, byTransportation Alternatives, an advocacy group in New York City.***

- ***Public outreach materials, such as brochures and how-to guides.***

- ***Material supplied by the Centre for Research and Contract Standardization in Civil and Traffic Engineering (C.R.O.W) in their publication:* Bicycle Parking in the Netherlands*, which was produced within the framework of the* Bicycle Master Plan *of the Ministry of Transport, Public Works and Water Manangement.***

- ***Information from the Dutch Design Manual:* Sign up for the Bike*, and* Cities make room for cyclists**.

- ***Information from the Great Britain Transport Research Laboratory, including the publication:* Cycle parking supply and demand.**

- ***Several publications from the German Bicycle Association (ADFC).***

- **ADONIS *report, developed and published in 1998 upon a research project of the EU regional Transportation Development program, commissioned by the European Commission, that deals with best practices to promote cycling and walking. The project was an* "Analysis and Development of New Insights into substitution of short car trips by cycling and walking". *Countries surveyed included the Netherlands, Belgium, Denmark and Spain.***

Bicycle Parking in North America

"*Planning for bicycling and walking involves more than just constructing bikeways and sidewalks. Many surveys have shown that the lack of adequate bicycle parking, change and shower facilities are second only to unsafe road conditions as the most common reasons why people do not bicycle. Providing ancillary facilities encourages people to use existing and proposed facilities.*" [1)]

Recent Developments

Bicycle facilities were eligible for federal funding under the Intermodal Transportation Efficiency Act (ISTEA), continuing under the Transportation Efficiency Act for the 21st Century (TEA 21). During the past several years, state and local agencies have been encouraged to provide facilities. As a result, many North American cities such as Seattle, Philadelphia, Los Angeles, San Francisco, Chicago, Portland, Toronto and Vancouver currently have bicycle rack installation programs like the CityRacks

program in New York City, established in 1996. Some of these programs, including those in Seattle and Toronto, go back to 1983. Recently, however, more cities have begun to take an increasingly institutionalized approach to providing bike parking facilities.

Several cities have adopted code amendments that require bicycle parking facilities to be included in new construction plans. This method has become very popular during the last couple of years and has been utilized in at least 15 U.S. and many Canadian cities. The cities of Toronto, Vancouver, Los Angeles, Palo Alto, and Arlington ,VA mention the provision of shower and change facilities in their by-laws.

Cost Sharing

Gaining popularity is the implementation of bicycle parking facilities through cost-sharing programs. Public/private partnerships are developed to install bike parking on the public-right-of way. Cities such as Seattle, Chicago, San Diego, Portland and Boulder, CO, Minneapolis, Cambridge and Vancouver have initiated cost-sharing programs for on-street implementation. Most municipalities first develop design guidelines for rack types, location selection and installation details. In some cases special racks were designed to complement the character of a particular building or district.

Bike/Transit - Making the Intermodal Connection

The FHWA's *National Bicycling and Walking Study* reports that a large portion of spaces at park-and-ride lots throughout the nation are occupied by autos that have been driven three miles or less. One of the goal of the FHWA is to promote a change of modes for short trips. *"In fact, the FHWA has targeted 10% of all short (five miles or less), individual vehicle trips to be made by bicycle by the year 2000."*[2)] Therefore, far more effort is needed to shift modes from motor vehicles to transit by increasing accessibility to transit.

A number of U.S. transit authorities have installed bicycle racks and lockers at transit stops and stations. These include San Francisco's Bay Area Rapid Transit (BART), Washington Metropolitan Area Transit Authority (WMATA), Southern California Rapid Transit District (SCRTD) and New Jersey Transit.[2)] One outstanding example for combining cycling and transit is the Long Beach Bike Station in California, established in 1996 at the city's main transit hub. It is the first full-service station in the U.S., offering such services as bike parking, repairs, selling accessories, serving coffee and snacks and more.

Bicycle Parking in Other Countries

Bicycle Parking Policy and Current Situation

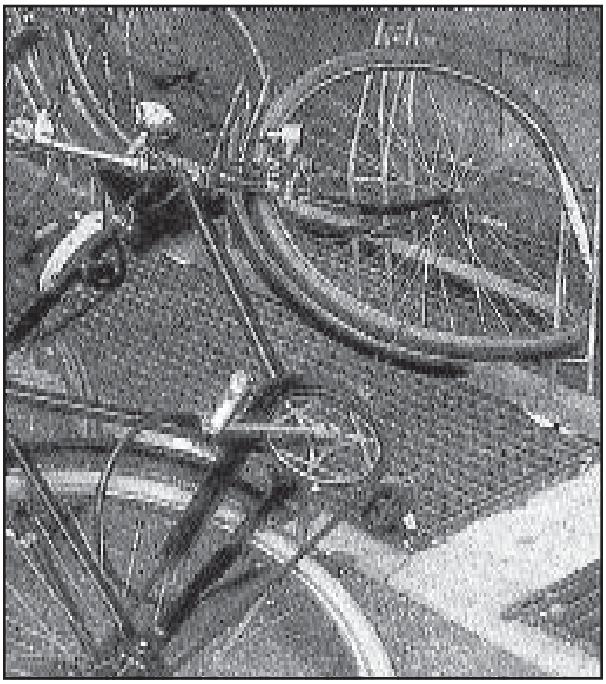
Many municipalities throughout Europe and Japan have developed various forms of government policy that mandate the provision of bicycle parking facilities. For example, a Bicycle Parking Policy has become one of the components of the overall traffic and transport policy in the Netherlands. Each municipality is required by law to provide bicycle parking facilities and is obliged to follow Dutch Building Regulations which mandate provision of storage facilities for bicycles in new buildings. National policy also requires that bicycle parking be available at every Dutch Railway station.

Japan has had national and local laws since the 1970's which require bicycle parking facilities near rail stops. Facilities range from simple racks to fully automatic bicycle parking garages, some holding more than a thousand bicycles.[3)]

Virtually all German cities have been expanding bicycle parking facilities through incentive programs, particularly in city centers and at transit stops. The City of *Muenster* (often referred to as "cycle city" by bicycle planning professionals) had over 6,200 racks installed

throughout the city in 1996 for a population of approximately 300,000.[4] By contrast, the New York City CityRacks Program has had to date a total of 700 racks installed for its population of approximately 8 million people.
The City of Muenster's major train station has a bicycle service station and all transit points have either racks or lockers available.

The city of *Bremen*, Germany established the country's first bike station. In addition, most of the city's parking garages supply guarded bicycle parking and bicycle parking facilities, available at nearly every transit stop, encouraging Bike and Ride. Also, old-fashioned "wheel-killer" facilities are being replaced by more appropriate racks throughout the city.



The "Wheel-Killer" facility (source: Institute for Urban-and Regional Planning, North Rhine Westphalia).

Bike/Transit - Making the Intermodal Connection

As outlined in the *Bicycle Blueprint* survey published by Transportation Alternatives in 1993, Bike and Ride is a major commuting mode in many European countries and Japan. Convenient bicycle access to transit stops make the railway a successful competitor to the automobile. According to the European Cycling Federation (ECF) (which consists of 13 countries), over 1,000 railway stations in eight European countries offer bicycle rental facilities.

Additional innovative bicycle parking initiatives reflected in this document come from Great Britain, Denmark, Belgium, Austria and Switzerland.

[1] U.S. Department of Transportation/Federal Highway Administration: *Bicycle and Pedestrian Planning Under the Intermodal Transportation Efficiency Act (ISTEA): A Synthesis of the State of the Practice*, page 79, July1997.

[2] *New York City Bicycle Masterplan, May 1997.*

[3] *Bicycle Blueprint: A Plan to Bring Bicycling Into the Mainstream In New York City;* published by Transportation Alternatives, pages 75-83, New York, 1993.

[4] *Bicycle Boom in Germany. A Revival Engineered by Public Policy;* Transportation Quarterly, Vol. 51, No. 4, pages 31-46, Fall 1997.

BICYCLE PARKING IN NORTH AMERICA

General Information

Bicycle Parking Security Levels

The Bicycle Federation of America (BFA) divides storage and parking facilities into high, medium and low security. It has also developed criteria for choosing the best type of storage/ parking facilities and how best to choose the most appropriate location for installation:

Class I, High Security facilities, generally refers to bicycle lockers, inside the building check-in and monitored parking facilities. These facilities protect the entire bicycle and components and accessories for an extended period of time.

Class II, Medium Security facilities, generally refers to bicycle racks that allow the frame and both wheels of the bicycle to be locked to the rack. A Class II rack provides firm support for the bicycle, yet leaves the bike exposed to the weather unless it is installed underneath an existing awning or something similar.

Class III, Light Security facilities, generally refers to a stationary object or vertical bar to which a bicycle frame and at least one wheel can be secured with a lock. These facilities are useful for providing short-term parking only.

Design Considerations

According to the *National Bicycling and Walking Study*[1)], three basic types of bicycle parking are needed: employee/long-term parking, short-term parking, and parking associated with transit facilities.

Employee/Long-Term Parking

Parking for employees should be dedicated as a ratio of required motor vehicle spaces, protected from adverse weather conditions and conveniently located relative to the place of work, preferably in the same building. Bicycle parking must be secure: preferably in a locked enclosure or in lockers visible to a security guard or parking attendant, with access monitored by the attendant. In order for users to feel comfortable accessing their bicycles in off-hours (parking areas should be accessible at all hours), parking areas should be well patrolled and well lit.

Bicycle parking should be accessible from driveways or ramps designed to accommodate bicycle travel. If a locked enclosure is not provided, the bicycle rack should be designed so that cyclists can lock the frame and rear wheel (at a minimum) to a stable, upright structure. This structure should be coated to prevent damage to the bicycle's finish, and designed so that the bicycle cannot twist or be knocked over. It should be sized to allow use of "U" style locks.

Short-Term Parking

Short-term bicyle parking is usually most needed near downtown businesses and at all public buildings (City Hall, library, police department, arts centers, etc.). Other appropriate locations for bicycle parking facilities include public garages (with the same characteristics as "long-term parking," above) and at the perimeter of public spaces. Short-term bicycle parking should be located in highly visible areas, but not where it will obstruct pedestrian traffic It should be planned in many small installations close to building entrances, rather than in a few large groups. In order to provide access directly from bicycle lanes or key bicycling streets, a curb cutout or pullout area should be provided so cyclists do not have to dismount in the street. Realizing that many people will ride to and from the parking area (regardless of regulations to the contrary), potential conflicts with pedestrian traffic should be minimized. The bicycle rack design should be similar to that previously described for long-term parking.

Parking at Transit Facilities

Transit facility parking should be highly secure and similar in many respects to long-term parking. If at all possible, bicycles should be parked in an attendant-controlled area. Since commuters leave their bicycles at one end of their trip or the other for an extended period, it is strongly recommended that enclosed or otherwise sheltered parking be provided.

1) National Bicycling And Walking Study, U.S. Department of Transportation/Federal Highway Administration, Case Study No. 20; *The Effects of Environmental Design on the Amount and Type of Bicycling and Walking,* pages 32-33, 1993.

Most Common Practices

Many North American citites have adopted a Local Bicycle Parking Ordinance and/or implemented a Bicycle Rack Request/Installation Program, usually at municipal expense. Other initiatives gaining popularity are Cost-Share programs. A Cost-Sharing program is a public/private partnership that usually relies on an agreed-upon set of Bicycle Parking Facility Guidelines to encourage and assist private installation of facilities.

Local Ordinances

According to the Bicycle Federation of America (BFA), local ordinances have been adopted in several municipalities requiring new developments to include bicycle parking in their plans. Ordinances are usually written to ensure that a minimum number of bicycle parking spaces are incorporated into new developments or building renovation projects. The list of municipalities that have taken this approach has grown rapidly in the last couple of years. Bicycle parking requirements are sometimes based on the number of automobile parking spaces or a building's square footage and use-type. The League of American Bicyclists (LAB) prepared a pamphlet that makes recommendations on how to get a Bicycle Parking Ordinance passed and developed bicycle parking requirement recommendations (see Appendix B).*1)*

"The Madison Example"

Madison passed its own bicycle parking ordinance in 1988 that requires the provision of off-street bicycle parking for new developments, for changes in use, expansions and other types of remodeling that would increase the required level of parking (a typical practice in the U.S.). This is consistent with the applicability of automobile parking requirements in Madison.

Bicycle parking is required in all areas of Madison even though automobile parking is not required in the Central Area. This is designed to discourage automobile use downtown. Providing bicycle parking facilities in this area encourages bicycle use as an alternative mode of transportation.

Bicycle parking requirements are based on the expected number of residents, employees, shoppers, clients, visitors, etc. Madison's bicycle parking requirements are 10% of automobile parking requirements with the exception of multifamily residential uses (1 per unit) and schools (grade specific). After the first 50 bicycle parking spaces (500 auto spaces), however, the requirement is cut in half. Thus, a shopping mall with 5,000 auto spaces would need 275 bicycle spaces.

Bicycle parking is required for all types of developments. Madison chose not to grant explicit exceptions for services for which few people use bicycles to do business. Their intention is to encourage cycle commuting by providing bicycle parking to employees.

No area, including the areas which some people feel are inaccessible by bicycle due to the lack of nearby bike paths or signed bike routes, is exempt from providing bicycle parking. It would be difficult to come up with a consistent definition of non-bicycle accessible areas, and it is the policy of the City of Madison to make the entire city accessible.

Location

The Madison ordinance states,"... bicycle parking facilities shall be located in a clearly designated safe and convenient location. ... The facility location shall be at least as convenient as the majority of auto parking spaces provided ...."

Design standards

The size of a bicycle parking space is (almost universally) specified 2 feet by 6 feet. Rack structures that require a user-supplied locking device shall be designed to accommodate U-shaped locking devices.

Maintenance

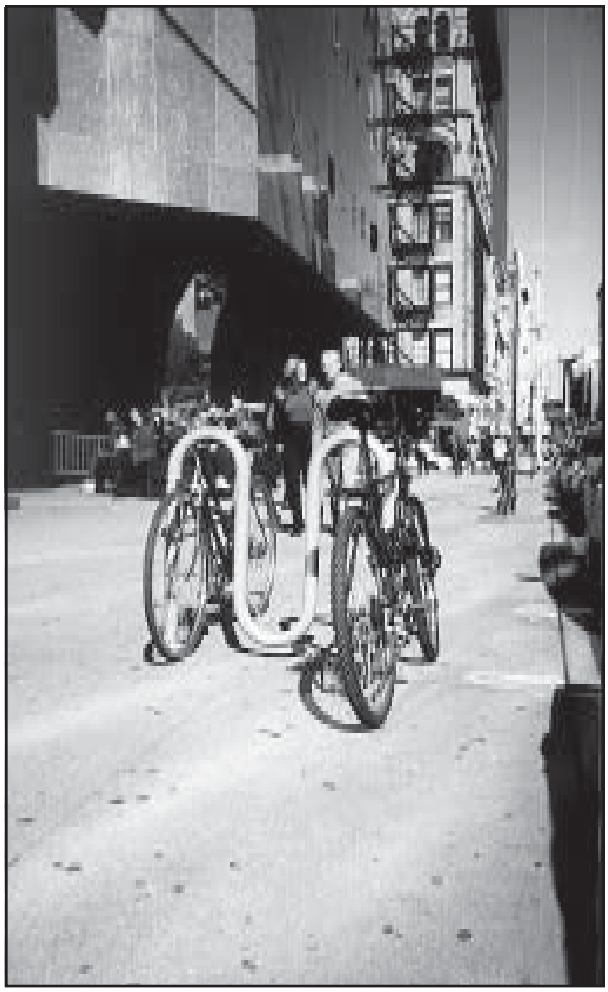
The Madison ordinance (and most others) require the surface of bicycle parking facilities to be designed and maintained to be mud and dust- free. In areas where it snows, racks should be kept free of snow and available for use.[2)]

"Other Locations"

Many cyclists choose not to commute by bike to their jobs because they do not want to arrive at work wet with perspiration. As an accommodation to cyclists, Palo Alto, Los Angeles, Arlington, Vancouver and Toronto have shower and change requirements included in their bike parking ordinances. In most cases there was little resistance to this addition from developers because many new buildings were incorporating fitness centers to attract tenants and, therefore, intended to install showers anyway.

Bicycle Rack Installation /Request Program

Among municipalities that provide bike parking, the most common means of doing so is a Bicycle Rack Request/Installation Program (as exists in New York City). These programs are particularly designed to encourage short-term types of bicycle trips such as shopping, running errands, going to the library, museum or movies. In most cities, the agency program recommends or provides one approved type of rack for installation on public property. For example, New York City provides the Inverted-U rack for two bikes and the Wave rack for more bikes. Racks are typically installed in response to requests from cyclists, businesses, property owners or other city agencies, or as a result of the city's own survey and analysis.



New York City Wave Rack (source: New York City Bicycle Masterplan)

[1)] *How to get a Bicycle Parking and Amenities Ordinance passed,* provided by the League of American Bicyclists and published by the League of American Wheelman, pages 1-8, 1994.

[2)] *Madison's Bicycle Parking Ordinance,* by Arthur Ross, Bicycle Coordinator, In: Bicycle Forum 19, pages 10-12, Spring/Summer 1988.

The location of the rack installation is recommended by the requester and examined by the implementation agency. When a site is proposed for installation of a rack, the implementing agency examines the location to see that it conforms to a pre-determined set of rack siting guidelines. Typical rack siting guidelines specify such things as setbacks from curbs, face of building, other street furniture and minimum sidewalk width.

New York City Inverted-U Rack

This type of program is in use in many other cities including Seattle, Los Angeles, San Francisco, Cambridge, MA, Chicago, Portland, OR, Philadelphia, Toronto and Vancouver. Some of these cities provide one particular rack while others give options to use different types of approved racks. The City of Boulder, CO, provided free Inverted-U facilities until funding was exhausted. However, the city has found a manufacturer that now produces the facility locally, which makes the purchase much cheaper.

The CityRacks Program in **New York City** was established by the city's DOT in 1996 to provide ample, safe and convenient bicycle parking to the public, improve air quality by encouraging non-polluting means of transportation, and to demonstrate the city's continuing commitment to promoting cycling for all trip purposes.

The program installs racks in response to requests from the public, other city agencies, and in-house research. The Inverted-U or Wave rack facilities are installed only on the public right-of-way, after inspection. A flyer is provided that explains the program (Appendices C shows the City Racks Program Flyer, Fact Sheet, General Guidelines, and the Bicycle Rack Clearance Standards).

As of July 1998, approximately 650 sites had one or more racks installed. By the end of 2000, a total of 2,300 racks are expected to be installed throughout the city of New York.

The **City of Seattle, WA,** started a similar Bike Rack Installation Program in 1983 to provide bicycle parking as part of the city's annual Bicycle Spot Improvement Program.

The picture shows the Hitching Post facility (sometimes referred to as staple) in use in Seattle. It is a highly recommended facility gaining in popularity throughout the States.

Between 1983 and 1992, 250 bike racks were installed. From 1993 to 1994, Seattle installed

over 1,400 additional racks with the help of ISTEA funding.

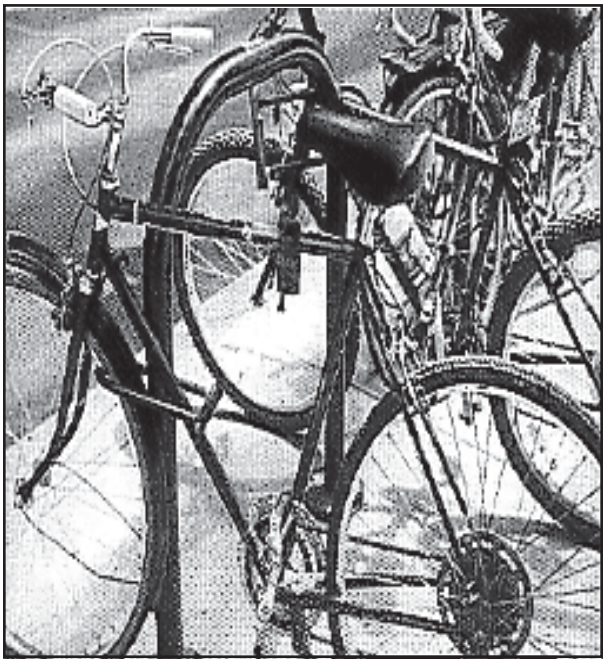
Once the program was awarded ISTEA money, it was advertised through news releases. This resulted in a substantial increase in the number of requests. According to the program manager, the best advertising was when the racks were being installed and cyclists were using them. These installations sparked the interest of both users and local businesses who were particularly excited by the fact that the program was paid for by the City. Information on the number racks installed to date is not currently available, but the program is still ongoing.

The **City of Chicago, IL,** Bicycle Parking Program was included in: *Improving Conditions for Bicycling and Walking, A Best Practices Report*, prepared by the U.S. DOT for the FHWA in 1998, which provides information on outstanding pedestrian and bicycle programs across the United States.

The provision of bike racks by the City was a natural point of departure given the availability of ISTEA/CMAQ funding and the recent release of Chicago's Bike 2000 Plan. The installation initially started in 1992 with a testing of thirty-one Wave-and Inverted-U racks at various buildings such as city hall, libraries, and municipal offices. The racks attracted use immediately. The test cost less than $15,000 and was funded through an existing guardrail contract.

The city applied for $750,000 for bike parking in the first call for CMAQ project proposals, which occurred soon after this successful trial. The first 1,100 racks were sited according to suggestions from city staff and volunteer survey teams from the Chicagoland Bicycle Federation. Special attention was paid to insure even distribution of available racks between government buildings, cultural institutions, parks, neighborhood retailers, and the central business district.

First responses to the racks were mostly negative, and some racks were removed soon after they were installed. However, as soon as the racks attracted use, they began to be seen as positive addition to the streetscape. In some cases racks previously removed were rerequested, and businesses that did not get racks wanted to know why they were overlooked.



Over 4,000 Inverted-U facilities have been implemented in Chicago (source: USDOT/FHWA Best Practices Report).

<u>*Successful Strategies:*</u>

* Use of the Inverted-U rack, which does not obstruct the sidewalk, can accommodate any type of lock and is easy to stand bikes against;

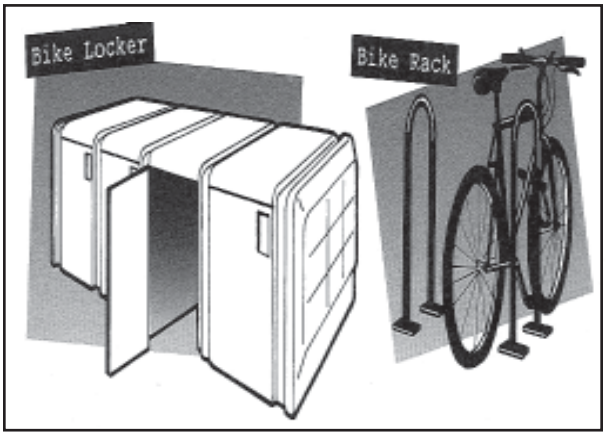
* Cyclists and property owners are invited to suggest locations through postcards, news paper articles, and the Internet;

* Consent to install a rack is secured from nearby property owners. Racks are conve niently placed at schools, parks, transit sta tions, museums, libraries, post offices, and other institutions.

Current Status
By the end of 1997, the City had installed about 4,250 racks as part of three separate CMAQ grants totaling $1.5 million. Another $170,000 grant has been received for 1998 rack installation.

A newly proposed project by the City of Chicago will include a demonstration of higher security, longer term parking. Further information regarding to this project was not yet available.

The **City of Los Angeles, CA,** Employer Bicycle Parking Program provides free Inverted- U racks and bicycle locker facilities upon request (until funding is exhausted). An additional 1,600 racks are currently going in place as well. The various neighborhoods have the option to choose from four different rack colors (Bike Program colors) for the Inverted-U facility.



Provision, delivery and installation of lockers and racks for free in L.A. (source: L.A. flyer).

The **City of Portland, OR,** provides free installation of a number of different approved racks. (see Appendix C). The only requirements are:

* There must be a demonstrated need for a rack;
* There must be sufficient space available on the sidewalk (if there is sufficient space on private property, the rack should be installed there first);
* There should be no competing uses of the sidewalk in the vicinity of the bike rack, such as a bus stop or sidewalk cafe tables and the rack has to meet the City's requirements.

The minimum required sidewalk widths are 10 feet for most sidewalks and 12 feet for major city sidewalks (common measures).

In addition, the city has donated bicycle parking spaces to schools, the administration building, a community center and a neighborhood facility.

Portland's 1996 *Bicycle Master Plan Report to the Portland City Council* stated that about 1,900 racks had been installed, mostly in downtown areas and neighborhood business districts." The city typically installs 200 to 300 bike racks per year on a request basis. Portland's initial goal was to have 3,000 short-term spaces implemented by 1998.

Above and Beyond
With a preliminary funding allocation of $50,000, the City of **Portland** Bicycle Program was able to do a comprehensive installation of **bike racks in neighborhood business districts**. The program coordinated with neighborhood business associations and resident organizations to survey the districts and decide where additional bike parking was needed. Approximately 150 racks were installed under the program, and an extensive list of recommended locations generated. In the case of one business district, a special rack (post-and-ring facility as used in Toronto and Cambridge, page 18) was designed and installed to complement the character of the district and to help visually tie together three unique sub-districts within the area. According to the program coordinator, working directly with established business districts proved to be more efficient than the rack-request program.

In **Los Angeles**, the city's first approach to provide for bicycle parking was a **Bicycle Parking Facilities Design Project**, encouraged by the LA

DOT Bicycle Coordintor in 1996.

Due to a lack of short-term bicycle parking facilities downtown, the bicycle coordinator encouraged architecture students to design racks for the downtown area. The project was funded by L.A.'s Community Redevelopment Agency.

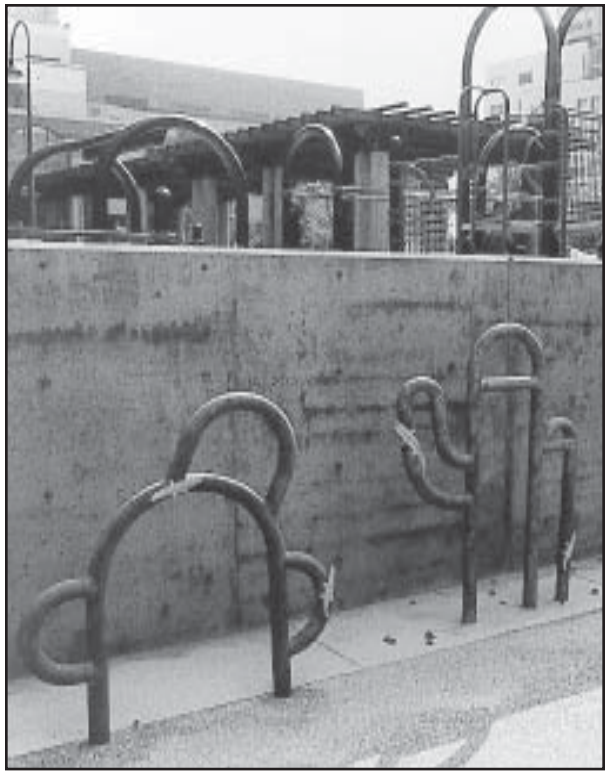
The designed racks had to be able to accept a myriad bikes and locks, require little maintenance over a 10-year life span and be freestanding.

One of the racks designed by architecture students as part of a bicyle parking project initiated in 1996 by the L.A. DOT Bicycle Coordinator.

A wide range of racks were designed, including sets of inverted hearts, and a pair of racks cast in the shape of a massive chrome bike chain.

The most complicated design was a "bicycle incarceration system" which opens like a bottom-hinged iron maiden, then closes around the bike, which is in turn chained to posts that secure the frame from thieves.

A pair of racks cast in the shape of a massive chrome bike chain.



Racks designed in the shape of a cactus with little lizards attached to them.

The project manager admitted that initially the racks were not well used due to a low number of bike riders and confusion about the purpose of the racks. More recently, however, the program has been a moderate success approximately 60% of the specially designed racks are regularly being used.

The Inverted Heart design provides good support for the bicycle.

Cost-Sharing Initiatives and Guidelines to Encourage Private Implementation

Cost-share programs encourage private rack installation on the public-right-of-way as an obvious means to provide adequate parking at a low cost to the cities. In **Seattle**, the program staff provides rack information to private parties and assists with the selection of a rack that meets the needs of cyclists and a provider's budget. The Seattle Bicycle Program staff reviews the sites and gives final approval. No permit is required.

In **Minneapolis,** the city subsidizes 50% of the cost of any bicycle rack that a private business owner wants to install.

Bike Central, a public private partnership, was established in **Portland,** between the Bicycle Program office, local health clubs and parking providers. The Program purchased bike lockers and clothing lockers and placed them in parking garages and parking lots (clothing lockers were placed in health clubs to enable cyclists to store a week's worth of work clothes). Affiliated athletic clubs manage the individual stations, but are not engaged in promoting the program. A Bike Central member survey found that 35% of all bicycle trips taken to work replaced single-occupancy automobile trips. Bike Central encouraged mode switching by providing needed elements to make bicycle commuting more convenient.

In **Philadelphia,** a Bicycle Parking Foundation was formed several years ago to improve bike parking locally while assisting other bike advocacy groups nationally. The Foundation's long-term goal is to form a national bike parking cooperative, enabling groups to design, fabricate, deliver and install the racks of their choice. The Foundation has assisted with installing bike racks for numerous Philadelphia businesses. The Foundation uses the Portland guidelines for implementing facilities (see Appendix C).

A business in Philadelphia chose to place these racks in front of their office building to complement the character of the building (source: Kryptonite Corporation).

The City of **Cambridge** Bicycle Parking Program provides free installation of city post-and-ring racks for businesses on a sidewalk or other city property if the *business pays for the unit* (which costs $66).

The program officially started 4 years ago but due to funding delays has only been implementing facilities for the past nine months. To date there are about 220 post-and-ring units installed, mostly through business requests but also upon the program's own survey (in which case implementation and unit costs are fully covered by the city).

The ring-and-post facility was chosen because it provides good support for the bicycle and an insult design complements the City's character. In addition, implementation is fairly cheap for this facility. The ring-and-post unit, which can hold up to two bikes, is also in use in Toronto and London, ON, and in one business district in Portland, OR.

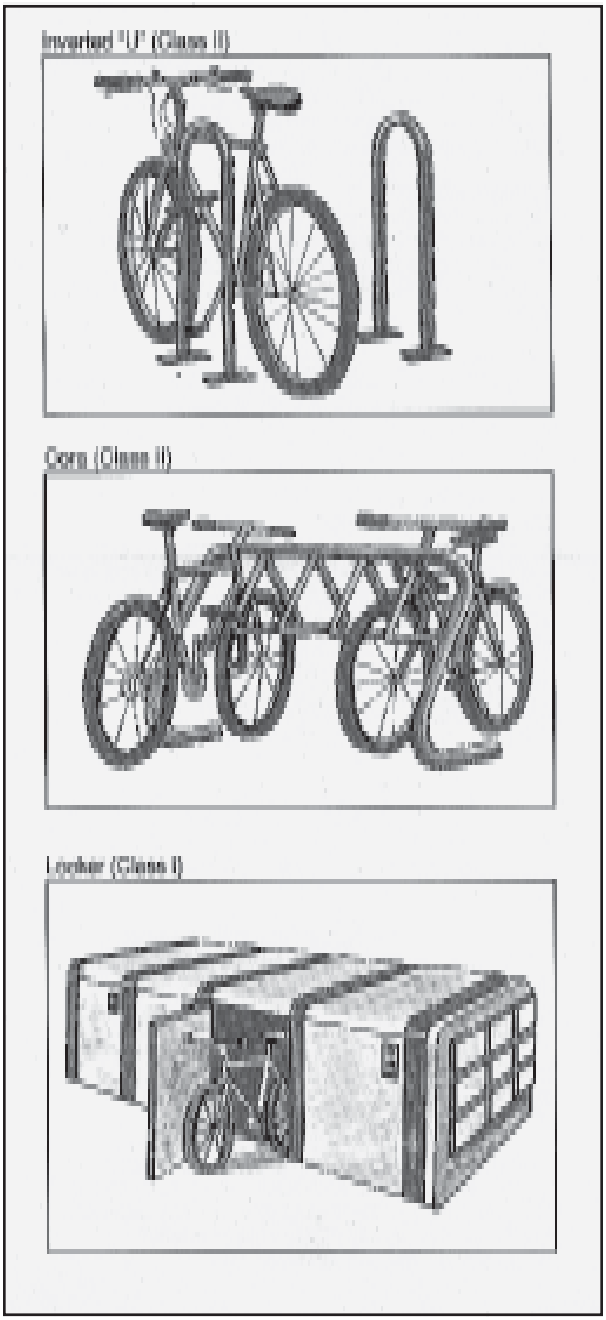
The City of Cambridge's Post-and Ring rack (source: Cambridge Community Development brochure).

Guidelines

Guidelines are often developed by local municipalities to guide the implementation of bicycle parking facilities by private entities or employers, both to save time and money and ensure the installation of effective and secure facilities. It may be mandatory to follow municipal guidelines where the provision of bicycle parking facilities is required by code, or, merely recommended where they are not.

Guidelines make recommendations on what type of facilities to use, and where to effectively locate them. They serve as helpful guides for government officials and personnel, developers, and business owners who want to provide good bicycle facilities and promote bicycle ridership among their residents, customers and employees.

Portland and Eugene, OR; Denver and Boulder, CO; Seattle, WA; Los Angeles, Palo Alto, Santa Cruz, CA; Boston and Cambridge; MA, and Vancouver and Edmonton, Canada are some cities that are using published guidelines to encourage and assist the installation of bicycle parking facilities by private property owners.



The Alternative Transportation Organization "Go Boulder" guide is distributed to businesses, employers and others to assist with bicycle parking povision.

Advertisement

Another initiative to encourage private implementation is to permit advertisment on bicycle parking facilities by law. Minnesota, for example has a law that allows advertisements, public art, and informal signs to be placed on bicycle racks and bicycle storage facilities.

Advertisement on Bike Racks in Minneapolis allowed by State law.

In 1993, the City of Edmonton initiated a sponsor-based bicycle parking program. A successful bidder places bicycle racks on the road right-of-way in designated high use areas of the city in return for advertising on the rack.

Similarly, some municipalities around Vancouver have signed contracts with advertising companies, who have agreed to install and maintain bicycle racks in exchange for displaying advertising on them.

It is generally recommended that bicycle facility guidelines should be associated with advertising on facilities since sub-standard facilities are often implemented to take advantage of a possible advertising stand.

Bike Parking as part of Multi-Purpose Designs

Not yet realized in New York City is the design of street furniture for multi-purpose usage, including accommodation for bicycles. Great potential exists in the redesign of newsstands and parking meters for multi-purpose usage, especially in light of diminished street space.

Secure bike parking in Minneapolis where a metal ring attached mid-way to a post allows the frame and one wheel of the bicycle to be locked on, - an effective way of using existing street furniture for bicycle parking.

"In Philadelphia hundreds of sidewalk bollards are being considered as potential bike posts (inverted U's) that have been installed with a federal grant." (Article by John Dowlin in the New York Times, 8/23/98).

A good example from Seattle of combined usage of street furniture for bicycle parking and news boxes. It is also an opportunity for cost-sharing.

Bicycle Locker Programs and Bike and Transit - Making the Intermodal Connection

Bicycle Locker Rental Programs have been used in a number of municipalities. In addition, several rapid transit systems across the country now provide bike storage lockers at outlying stations so that bikers can ride to a station, lock their bike and then ride the train to their destination.

Minnesota Rideshare (source: cycle-safe brochure).

General Recommendations

Bicycle lockers are recommended as a long-term parking facility in areas where security is in question or where there is limited opportunity to provide weather protection.

The U.S. DOT/FHWA recommends that lockers should be located where an attendant can monitor their use. Use should be limited to a specified term (e.g. 24 hours), with lockers being cleared accordingly. Lockers can be set up for free use (bring your own lock), for coin operation or for operation using cards or tokens distributed via a permit system. A required key deposit with a quarterly maintenance fee can be an effective management tool to keep track of when a locker is being used regularly.[1)]

In general, active marketing of locker programs, careful selection of lockers and a good system of administration and technical guidance, in conjunction with safer cycling routes to stations, are recommended to encourage people to bike and ride. In particular, guarded bicycle parking facilities (popular in Europe and Japan), offer the best protection against vandalism. Employers, who provide space or money for car parking, are also urged to offer bicycle lockers.

Existing Locker Programs

As previously mentioned, bike lockers and bike racks are available at the San Francisco Bay Area Rapid Transit (600 lockers and 1400 racks), the Washington Metro System (650 lockers with waiting list) and the Sacramento Regional Transit's light rail service.

Using ISTEA funding, train stations and bus stops in Minneapolis were outfitted with lockers to faciliate bike and ride. The local transit company in Vancouver has installed bike racks and lockers at major transit exchanges. Most of these are located in the suburban areas outside of Vancouver.

The City of Portland, OR, administers over 200 locker spaces at transit stations and in the downtown area. Expensive car parking in these areas makes bicycle lockers very desirable. The lockers rent for approxiamately $10 per month ($7.50 per month if you rent for six months or more). A key deposit is required to cover costs in case of a lost key. The program provides a variety of lockers purchased from Cycle Safe, Creative Pipe and others. The lockers are generally located on wider city sidewalks or in city owned garages.

The Portland Transit Authority purchases lockers for their light rail terminals, bus line transit centers and park and ride lots. The city generally administers these lockers when they exist within the city limits. Portland also has many additional privately installed lockers which are generally well-used.

Madison, WI, has installed about 20 lockers which are mostly rented-out on an annual basis (for $60 each). The city claims that there is very little vandalism or misuse. Fees cover the long-term administration, funding is only necessary for initial installation. According to the system administrator, the locker rental program works best when lockers are leased yearly. This way, the locker is kept locked even when nobody is using it. As a rule, lockers left open are subject to vandalism.

In the New York area, lockers have been installed at selected stations on a trial basis on the New Jersey Transit (NJT), the Long Island and Metro North commuter railroads.

Less Successful Locker Programs

Some locker providers have reported problems. According to NJT, bicycle locker installations are not as efficient as expected. Costs are very high and the facilities are not being used as much as less expensive bike racks which are also available. However, NJT currently plans to install 139 lockers at 22 stations and 704 racks by the end of this year (as of now only 9 of 161 NJ transit stations have lockers). NJT has been installing bike racks underneath awnings and canapes for weather protection when possible.

The Bicycle Locker Program at the Long Island Rail Road was set up as a demonstration project, and facilities were placed at four sites. Municipalities were meant to administer the sites but have not. Reasons given by municipalities for opposing lockers include the fear that they will be used as homeless shelters or storage places for things other than bikes. Police departments have expressed concern that lockers would be perfect places to store explosives.

Bicycle Racks provided by New Jersey Transit.

Due to vandalism, racks and lockers have been removed by the transit authorities in Atlanta, Philadelphia and Milwaukee.

[1)] *U.S. Department of Transportation/Federal Highway Administration:* Bicycle and Pedestrian Planning Under the Intermodal Transportation Efficiency Act (ISTEA)*: A Synthesis of the State of the Practice, July 1997.*

Bike Station - A special form to Combine Bike and Transit

One high profile means of encouraging combined use of bicycles and trains, common in the Netherlands and Japan and now being initiated elsewhere, e.g. Denmark, is the provision of Bicycle Stations. These offer a range of services in addition to secure and convenient cycle parking, for example cycle hire, cycle repair, cycling and tourist information. In some cases, other facilities are included such as newspaper kiosks, to assist economic viability. The Bicycle Station should be seen as an integral component of the bike and ride system and part of a wider network to encourage the full potential of the bicycle and public transport. The human contact of a guarded parking area may be preferred by users to an automated system.

Even where the full range of services provided at Bicycle Stations is not feasible, it is helpful to have cycle hire facilities at or near stations, as well as information about safe local routes for cyclists. In Switzerland, for example, bicycles can be hired at each of the country's railway stations and these facilities are promoted as part of rail-based tours.

The first Bike Station to be established in the United States opened in Long Beach California in 1996.

The Long Beach Bike Station was the first one to open in the U.S. (source: The Station's Chain Letter)

The Long Beach Bike Station concept was modeled after the many successful European and Japanese examples.

"In contrast to the U.S. Japan counts about 8,300 bike stations and there are over 3,000 such facilities throughout Europe. The Netherlands counts 84 bicycle stations with capacities from 1,150 up to 4,000 bicycles."

The Long Beach Bike Station offers a manned, bicycle commuter facility which links to the existing transportation system. It is strategically located at the transit mall serving a Metro Line, Long Beach Transit, a Runabout shuttle, bike paths and a downtown shopping and dining district.

The Long Beach Bike Station provides full services including:

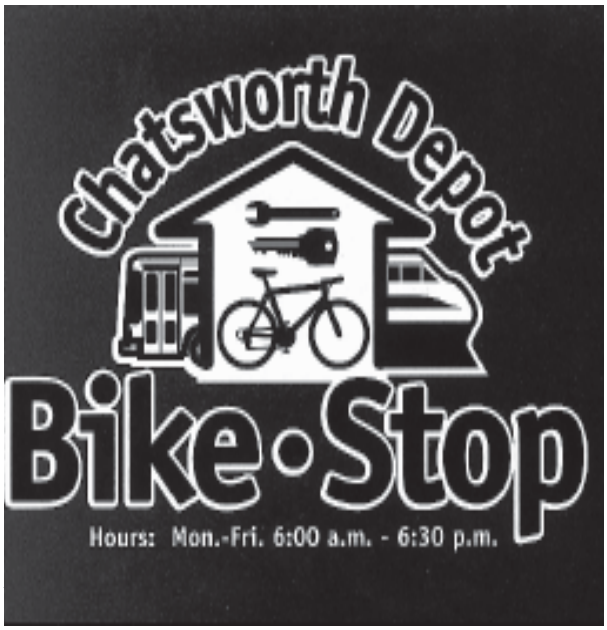
* Valet parking - enclosed, guarded bicycle storage;
* Bicycle repairs and tune-ups - available at market rates, while-you work or wait;
* Retail merchandise and bike accessories;
* Restroom and changing areas, Coffee bar and patio;
* Education programs - bike safety and maintenance workshops;
* Commuter Bike Club - monthly benefits package for regular commuters, cycling clubs and transportation coordinators;
* ZAP Electric Bike Retail and Rental Outlet.

Primary funding to start the Long Beach Bike Station came from ISTEA's Congestion Mitigation and Air Quality Program (CMAQ) and the Los Angeles County Metropolitan Transportation Authority (LACMTA).

Salaries, marketing and general overhead are equally funded by the city and LACMTA. It has developed into a convenience center for bicyclists and acts as a booster to transit ridership.

According to the FHWA's *Best Practices Report,* community leaders believe the bike station has enlivened the street and attracted tourists.

Facilities like the Long Beach Station are scheduled to open this year in Santa Clarita and Palo Alto, and more are being planned. Los Angeles recently (about a month ago) opened a *Bike Stop Station* in downtown which provides services similar as to those offered at the Long Beach Station.



BICYCLE PARKING IN OTHER COUNTRIES

General Information

Planning for cycling and the development of bicycle facilities is much more advanced in some European countries and in Japan than in the United States. European countries have long accepted cycling as a form of transportation not just for recreation but for commuting purposes.

As a major difference, many European countries prioritize environmental concerns more than the U.S., and this is reflected in their bicycle planning efforts. Use of the automobile is discouraged in Europe and Japan by auto restricting policies and initiatives that artificially inflate the cost to drive such as high fuel prices, high taxes on car sales, high parking costs and high tolls on national highways in some cases. Simultaneously, the use of the bicycle as an alternative, both by itself and in conjunction with other modes has been made much faster, safer, cheaper and overall more convenient. In general, throughout the cycling countries abroad, it can be found that federal initiatives have encouraged local cycle-friendly projects and set the basis for a guiding principle that the car and the bicycle are to have equal status as a means of transportation.

The importance of providing adequate bicycle parking facilities as part of a successful and comprehensive bicycle planning strategy has been well recognized in The Netherlands, Germany, Great Britain, Belgium, Switzerland, Scandinavian countries and Japan. For example, throughout The Netherlands building permits can only be granted when building applications meet bicycle parking regulations adopted by local authorities. In many cases this means buildings have to provide equal amounts of motor vehicle and bicycle parking facilities. In The Netherlands regulations refer to the country's building regulation.

Experiences from other countries can be useful to broaden the scope of ideas and innovations that currently exist in the United States. The following section does not completely cover existing programs and efforts from other countries but gives an overview of some of the more unique and comprehensive strategies experienced and realized abroad.

Facts from the Netherlands

Basically every site in the Netherlands is accessible by bicycle, and therefore, a need for bicycle parking facilities exists almost everywhere. According to the Dutch Design Manual *Sign up for the bike,* about 900,000 bicycles are stolen in the Netherlands each year. In some larger cities the chance of a bicycle being stolen is about 40%.[1)]

"Only in recent years has thinking about bicycle parking in the Netherlands begun. Bicycle theft was an important reason, but also the ordering of public space and the image of the bicycle. The subject has gradually become a serious aspect of a policy aimed at limiting the increase of car traffic and providing alternatives for this. Bicycle parking policy thus has developed into a major component of the overall traffic and transport policy in the Netherlands."[2)]

In order to convince local authorities of the need for bicycle parking provision, and to provide them with the knowledge required for the development of bicycle parking policies, *Making Room for The Bicycle, Guidelines for Parking and Storing*, was published by the Center for Research and Contract Standardization in Civil and Traffic Engineering (C.R.O.W) in 1996. Using these guidelines as a reference and manual, bicycle parking plans were drafted for four Dutch municipalities, including Rotterdam, Hengelo, Valkenswaard and Arnhem.

Systematic Bicycle Parking Provision

In **Utrecht**, one of the largest cities in The

Netherlands, an independently operating bicycle parking company/organization monitors the supply of bicycle parking facilities. The company is associated with the municipal car parking company, which enables car parking charges to flow to the implementation, maintenance and administration of bicycle parking facilities.

In **Amsterdam,** the Amsterdam Association of Bicycle Parking Facilities Organization (AMSTAL) has been set up to assist and advise licensees who run cycle storage facilities. AMSTAL approves and recommends local bicycle parking projects to be subsidized by the city council. Comprehensive neighborhood district plans are developed by prospective operators and submitted to the council. A similar approach has been undertaken in **Rotterdam** where a comprehensive bicycle parking plan that covers major destination points and locations was developed by an established organization and approved for funding by the city council.

The city of **Hengelo** divided its area in 50 meter sections to analyze capacity and to identify potential locations as part of a comprehensive bicycle parking plan. The plan of **Valkenswaard** includes the replacement of old-fashioned facilities with better racks and installation of video cameras to monitor the most theft sensitive places.

In Valkenswaard, more secure and convenient bike parking facilities are replacing old ones (source: C.R.O.W Bicycle Parking in The Netherlands).

In general, facilities are being paid for by the users, the providing organization, and the city (tax revenues). The chairman of the board of the bicycle parking organization in Utrecht claims that although provision of diverse bicycle parking facilities has increased, more efforts are needed to create parking, especially near homes in older neighborhoods where storage space is not available within most buildings. One approach to fill a lack of parking in these areas has been the implementation of bicycle drums and cages that are either accessible through group keys or with electronic locksystems or chip cards.

In addition, the fact that many government officials (such as council members) are avid cyclists themselves encourages the public to cycle.

The Bicycle Drum is an innovation for older neighborhoods where houses often lack enough storage space (source: Moderne Rad-verkehrsanlagen und Fahrrad-Infrastructure-Perspectiven fuer Muenchen).

[1] *Compare* "Sign up for the bike"; *Design manual for a cycle friendly infrastructure, published by the Center for Research and Contract Standardization in Civil and Traffic Engineering (C.R.O.W), pages 239-258, 1997.*

[2] "Bicycle Parking in The Netherlands", *prepared by the Center for Research and Contract Standardization in Civil and Traffic Engineering (C.R.O.W), Preface, September 1997.*

Bike and Transit - Making the Intermodal Connection

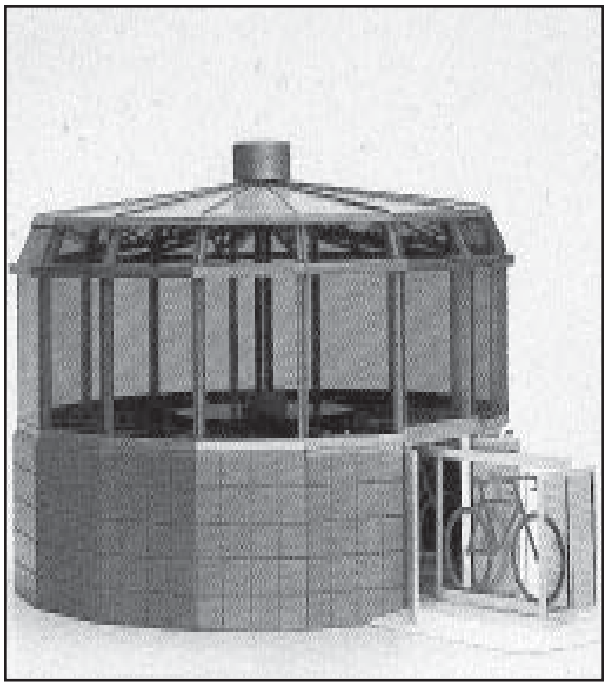
The Dutch Railway Company has approximately 375 railway stations that all provide some type of bicycle parking facility. Typically a combination of guarded (at about 80 stations), and unguarded facilities (often lockers) exist. Generally guarded facilities are combined with repair and rental services and selling accessories for sale.

The main train station in Groningen[1)] has as many as 4,000 attended spaces for bicycles and even more unattended racks.

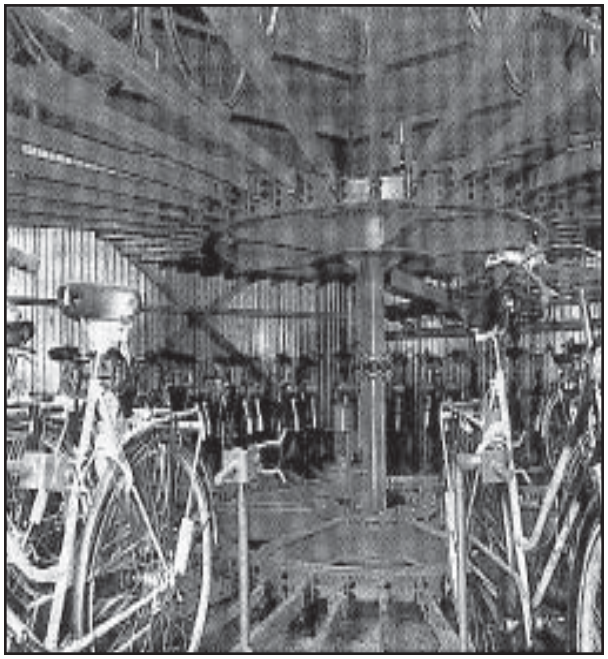
Other Dutch public transport companies are providing bicycle parking near bus stops.

Sheltered facilities are often found at bus stops (source: C.R.O.W, Bicycle Parking in The Netherlands).

Facilities vary from simple cycle-racks and stands to lockers and automatic storage units such as day-lockers and bicycle roundabouts, which are still being experimented with at various locations in The Netherlands.



The Bicycle Roundabout is an automatic storage facility experimented in The Netherlands. (sources: (top) Wohin mit dem Fahrrad, German Bicycle Association (ADFC); (bottom) C.R.O.W, Sign up for the bike).



1)The U.S. World Watch Institute ranks Groningen as the number-one cycling city in Europe and number three in the World.

Exceptional Initiatives

Some cities are experimenting with bicycle parking projects as possible job-creating schemes which are usually eligible for a variety of governmental subsidies. A government job-creation scheme in Groningen included 40 long-term unemployed people to work at a cyclepark in a center city multistorey parking garage. A similar approach is undertaken by the cities of Amsterdam and Rotterdam.

Finally, some "Take and Ride" programs (loan a bike, electronic tagged bikes) are gaining popularity. In Amsterdam these programs have been established in districts with high-profile attractions such as the Amsterdam Zoo, Tropical Museum and the Market. Cylce couriers plan to use the cycle loan scheme in various districts.

Facts from Germany

Although bicycle parking is basically provided in all urban areas throughout the country, many facilities do not provide adequate safety and quality and therefore are not being used. Initiatives are underway in various states and cities to improve conditions.

A very common but old-fashioned bicycle parking facility is the bicycle clamp (shown on page 59 and also referred to as a "wheel-killer" facility since it only supports the front wheel which can easily bend and be damaged). This type of facility has recently been replaced (by municipalities) with better, more secure types.

Recently reviewed federal guidelines for bicycle facilities (Bicycle Facilities Recommendations, ERA 95) include bicycle parking facilities recommendations that cities are using for improvements. In addition, the German Bicycle Association (ADFC), a nationwide organization and member of the European Cycling Federation[1)] began a government sponsored facility test program in 1996. Different facilities were evaluated based on the security they provide, their accessibility, their safety for other traffic participants, maintenance requirements, succeptability and effectiveness of the locking device that secures the bike. The result was a selection of facilities that the ADFC now officially recommends.

The picture shows one of the ADFC recommended bicycle racks, in this case well used on the public right of way in Frankfurt.

Advertising often accompanies many bicycle parking facilities. However, the ADFC has called for the institution of qualitative requirements for bicycle parking facilities to avoid misuse of pseudo-cycle facilities that exclusively serve as advertisement stands.

[1)] *The European Cycling Federation (ECF) currently consits of a 13 country membership that encourage intercontinental cycling by developing a European wide network.*

Some Comprehensive Local Bicycle Parking Programs

Muenster, North-Rhine Westphalia

In 1992, North-Rhine Westphalia included bike parking provisions in their building regulations. In 1995, the state passed bike parking ordinances that now require public buildings and institutions to provide storage for bicycles as needed.

Replacement of car parking by bicycle parking in Munster (source: City Planning Department, City of Munster).

The government of the federal state North-Rhine Westphalia has followed up the federally sponsored project with a series of cycle-friendly schemes in the region's municipalities.

Muenster , the economic center of Muensterland, North-Rhine Westphalia, has a population of about 300,000 and is home to Germany's fifth-largest university. Thirty-four percent of its 300,000 people use the bicycle for local transportation, - the highest level of bicycle use in Germany. In 1992, the city received the ADFC cycling club's national "Golden Bicycle Award" for being the cycle-friendliest city in the country. In 1996, the city counted more than 6,200 bicycle racks that were implemented through the municipal rack installation program.

As shown in the picture (left), many car-parking spaces have been replaced by designated bicycle parking spaces. All free car parking has been eliminated in the city center and racks have even replaced some former car lanes.

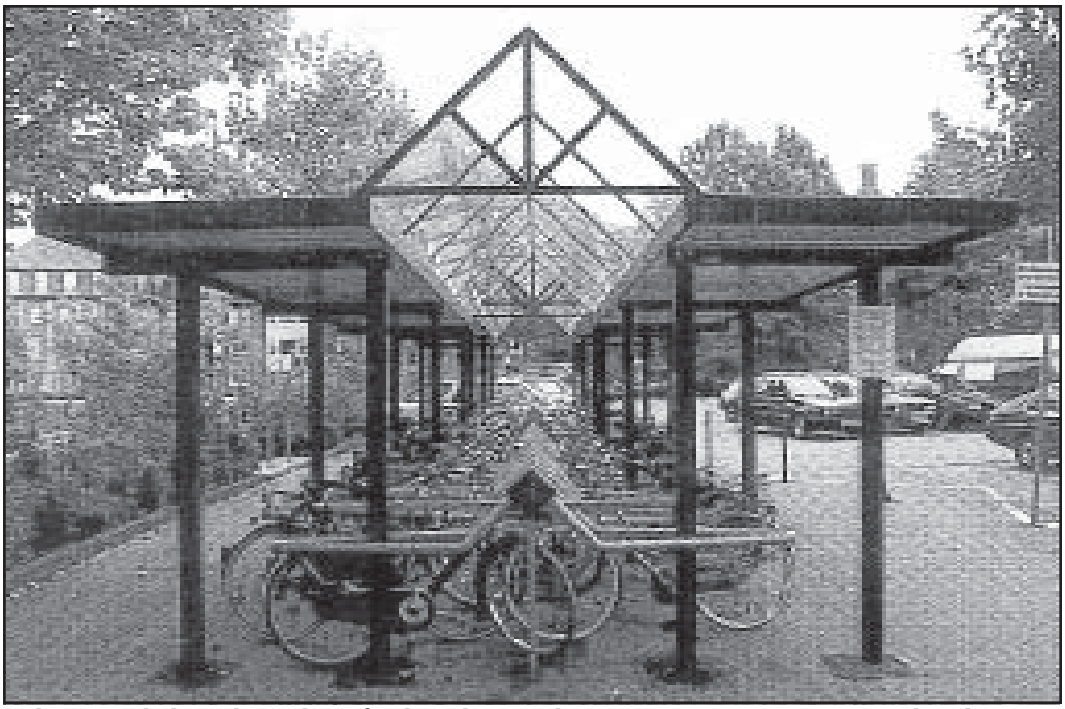
City-center shops have been commissioned by the local authority to site racks in front of their premises. Other innovations include special bike rack designs, sheltered racks, and theft proof bike cages.

In addition, a major concept of the city's bicycle parking scheme is to provide a few large scale bicycle parking facilities near the center of the inner city and many smaller scale parking facilities at various surrounding locations.

Larger scale parking facilities are generally used by people that are shopping in the city center and have to run more than just a few errands. Bicycle parking is also provided at most destinations in outlying areas. As a general rule, Muenster makes public space available for bike parking when there is no space on the private property.

Due to the large number of bikes, time limited parking was established at Muenster's train station where more than 2,000 bikes are parked every day. Currently, Muenster is building a bike station for 3,000 bikes which is expected to open in 1999.

The city also supplies bike lockers which people can rent for a fee. For financial and aesthetic reasons, however, very few lockers exist in Muenster. Instead, the city is now trying to use more bike cages which seem to be safer, less expensive, and less visibly offensive.

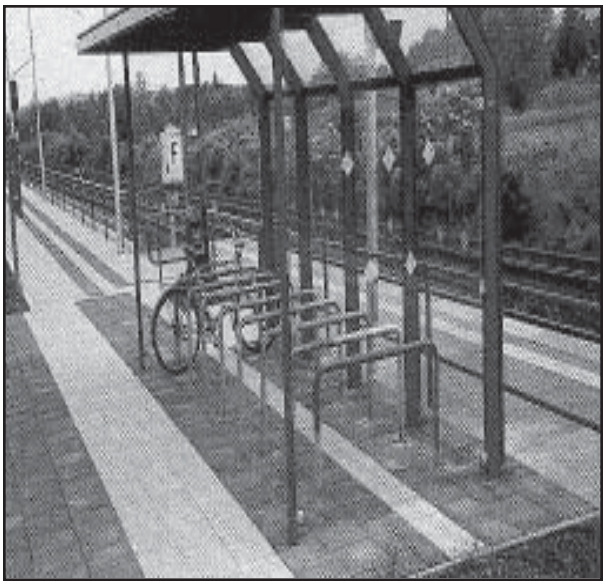


A large scale bicycle parking facility close to the city center (source: Weisstalwerk; manufacturer).

To assist and encourage private implementation, the Public Information Division of the City Planning Department has prepared a special guide that supplies information on how to plan effective bicycle parking provision. In addition, the guide lists approaches that have been successful in encouraging bicycle parking.

The city gives awards anually to firms that do the most to increase bicycling among their employees by providing showers, bike lockers, bikes to borrow, bike racks and allowing a flexible dress code. Another award is given to the "cycle-friendliest building" in Muenster. Those initiatives are meant to encourage private property owners and employers to provide bicycle parking and to gain as much publicity for the project as possible.

Bike and Ride associated with buses is also being promoted, with cycle storage provided at many bus-stops. At most major inter-modal transfer points there are covered racks and in a few cases, cycle lockers. As part of the bicycle promotion promotion program in Muenster, bicycle rental facilities are provided at all train stations and many other transport nodes throughout the region. On the main road into Muenster there is a park-and-ride facility where visitors can catch a bus to the center or, for five marks (approximately $3), hire a bike.



Sheltered facility to promote bike and ride (source: Wohin mit dem Fahrrad, ADFC).

The problem of people storing bikes for long periods of time at the station and in the city center is dealt with in an unusual way: every day a different colored strip is stuck onto all parked bicycles and those that are still there after four days are removed; in some busy shopping streets the limit is two days. Owners can recover their property from a depot, but around 400 bikes are left unclaimed every year.

City-State of Bremen

Bremen, considered the second most bicycle friendly city in Germany, was the country's first city to establish a guarded bike station at its main train station in 1982. The city also has had a rack installation program since 1993, facilities are provided throughout the city.

The city reduced portions of car parking and replaced it with guarded bike parking in most car parking garages. Approximately 300 racks are available at transit stops; some main stops provide bike lockers or boxes (see picture on next page).

A Bike Station at Bremen's main train station. Due to high demand, racks have been added in front of the station.

A survey of the cycle population showed that most people are willing to pay for safe and secure bicycle parking facilities. Over 60% would pay about one dollar per hour and four dollars per day. A plan for an automatic bicycle parking garage in the city center has been considered.

Combined short-term and long-term bike parking recently realized at a bus stop near a retail area outside of the city center. Bus service goes directly into Bremen's city center and to various other locations.

Bremen also hosted the nationwide conference on cycling issues called "A Space for the Bike - Concepts to Improve Cycling in Cities" in 1993. A major topic of the conference was effective bicycle parking planning. General recommendations made at the conference included the overall reduction of car parking spaces and replacement with bike parking; to increase Park and Ride and Bike and Ride in urban areas; to encourage various districts and retailers to participate in cycle planning; to include bicycle planning financing in local budgets; to encourage private parking associations to turn into modern economic-parking associations (inform about economic benefits of providing bike parking); to seek parking garage owners cooperation; to encourage employers/companies to provide bicycle parking to increase the number of bike stations offering various services; to include the requirement of bicycle parking facilities as a component of local ordinances; and consider advertisement on facilities where appropriate for cost-sharing.

The conference concluded that effective bicycle parking facilities can only be realized if the public as well as businesses, companies and other institutions cooperate with local planners to provide facilities. Bicycle parking has to be planned comprehensively and implemented citywide in order to effectively encourage cycling.

Freiburg, Baden Wurttemberg

The local policy in Freiburg is very pro-bicycle out of concern for the environment. In 1987, the city had 2,200 racks installed in the city center. Another 2,800 were installed by 1996. Over 1,500 bike racks are provided at transit stops, and the main train station has space for over 850 bicycles. All public-transport interchanges on the edge of the city have Park/ Ride and Bike/ Ride facilities. The city has experimented with various types of facilities to find out which are most popular. Intensive research has been done on identifying best locations for placing racks considering the various purposes of parking.

The Traffic Division of the Ecological Institute in Freiburg gives advice on what type of facilities to use in different locations throughout the city. A combination of racks and cycle-parking bays is also being considered for less and more expensive bikes respectively.

Munich, Bavaria

The city of Munich has 28,000 bike racks installed at public transport stations. A map developed by the Department of City Planning indicates bicycle parking facilities at stations.

In the future, the Department intends to regulate the number of bike parking facilities required in residential and commercial buildings to provide a certain amount of bicycle parking facilities as existing in some states of Germany.

Bicycle Parking in Frankfurt. Again, some street furniture offers good options for combined usage.

Frankfurt, Hessen

In 1992, the city of Frankfurt started to install bike parking facilities at well known inner-city destination points. In addition, the city has a bicycle rack request program. Through the rack request program, private organizations or institutions can fill out a simple application (including a drawing of the site). As long as basic requirements are met, free rack installation is provided by the City.

Facts from Great Britain

In the UK, the Government's Cycling Policy Statement (UK DOT, 1994) emphasised the promotion of cycling as a way to stay fit and healthy, to save on personal expenditure and reduce harm to the environment.

A *National Cycling Strategy* (UK DOT, 1996) was developed through a partnership process involving public and private entities. The partnership was co-ordinated by the Department of Transport. The National Cycling Strategy focused on four issue areas, including cycle security. The goal of the Strategy is to double the number of cycle trips by the year 2002, and quadruple the number by 2012[1)]. Recommended actions for improving cycle security include local parking programs at all major destinations and the establishment of cycle parking standards in conjunction with local development plans. A recently developed government guideline, *Cycle Friendly Infrastructure - Guidelines for Planning and Design (1996)* states that cycle parking needs to be secure, easy to use, conveniently located in a central area, adequately lit, well marked with signs, supervised, and protected.[2)]

A number of local authorities in the UK impose development controls which incorporate guidelines on the provision of cycle parking facilities. The number of bicycle parking spaces are either determined on the basis of the total floor area of a building, car parking spaces, or number of beds.

A study commissioned by the Department of the Environment, Transport and the Regions (formally called DOT) examined cycle parking conditions in the cities of Leicester, Nottingham, and Southampton with regard to adjacent land use, location and journey purposes. The surveyed cities all provide "Sheffield" stands (named after the city where they were invented) around their city center particularly at educational establishments, civic centers, food stores, shopping ares, public buildings, transit stations, business and commercial premises and tourist sites.

In Nottingham, public stands are often provided in groups of 3 or 4, and each cycle parking area carries a blue cycle parking sign together with details about the city's cycle locker scheme.

The City of Southampton also uses railings and "Butterfly" stands in addition to "Sheffiled" stands. The Southampton ferry terminal has installed a number of bicycle lockers as part of a "Cycle and Ride" program.

Sheffield stands were cyclists' preferred form of parking (source: TRL report 7/97)

In Liverpool, a Cycle Center (a number of which are being established around the country) serving a city population of about 450,000 opened in 1996 and includes a range of facilities such as parking, showers, repairs, and accessories for local cyclists.

Cycle Parking schemes involving smart card technology and/or closed circuit television are relatively new innovations. Closed circuit television and the presence of security personnel have been an effective deterrent to cycle theft at various Park and Ride sites. The Cambridgeshire County Council has combined video

surveilance with a number of bike locker sites in an attempt to deter theft and encourage more cyclists to ride to work.

A more ambitious scheme was tried in Portsmouth in 1995 to enable registered users to access and borrow a cycle from a secure compound with a smart card entry pass. After the cycle journey had been completed, cycles would be parked in another safe compound. The success of this scheme has not yet been evaluated.

[1] National Cycling Strategy, *DOT, London UK, 7/1996.*

[2] Cycle friendly Infrastructure - Guidelines for Planning and Design, *UK, 1996.*

Facts from Belgium

Many Belgian cities have experimented with new types of bike racks to replace the old-fashioned "wheel killers". In addition, car parking spaces are replaced with bike parking as part of the local policy.

City of Gent

A specialized rack was designed for the city of Gent in 1994. It was placed in pedestrian areas, near public buildings, and on the streets in the city center. The city of Gent also has an underground cycle parking facility which was provided for employees of the local government and is accessible by smart card.

City of Brugge

An agreement between the City of Brugge and the National Railway was made to improve bicycle storage facilities near the main railway station. Approximately 1,500 racks will be placed in front of the station, 50% of which will be guarded and paid for by the user. Initial implementation will be paid for by the railway company.

Facts from Denmark

The Danish government started to provide funding for cycling facilities in the country's urban areas about ten years ago, by provided grants for towns to develop their own cycling facilities. The aim was to increase cycle-use and cut casualties among cyclists.

The Ministry of Transport is currently developing a Bicycle Master Plan to promote safe cycle traffic. The plan will be published in 1999. Bicycle thefts are a big problem for cyclists in Denmark and result in great expenses for police departments and insurance companies. Therefore, more attention is recently being paid to providing secure and adequate bike parking throughout the country.

Cycling is very popular in Denmark and many cyclists belong to the Danish Bicyclist Union, a formidable lobby with more influence than some political parties.

To prevent Bicycle theft and encourage cycling, new security systems are being developed and installed at traffic terminals and other important destinations for cyclists throughout the country.

The Danish National Railways (DSB) has a "Cycle Center" program that builds weather-protected and guarded bike storage facilities at rail stations. Cycle centers offer locked parking, repair service and sales of accessories and new bicycles.

Copenhagen

Copenhagen has a very unusual way of preventing bicycle theft and encouraging cycling throughout the city: it provides free unique, useful but clumsy looking bikes that have non-standard parts and are brightly painted, easily recognizable and available throughout the city center. Sponsors of the program have advertise-

ment on the bicycle frames and on advertisement columns at each bicycle rack as well, which include a small map of the city.

The "city bicycles" can be found at 120 racks placed throughout the city center and can be used by everyone. The project, which started in 1995, provides over 3,000 bicycles. A similar project has been proposed by the City of Brussels, Belgium, for which the Copenhagen system served as an innovative example.

In addition, the City of Copenhagen provides adequate bicycle parking throughout the city.

Facts from Austria

The country's capitol **Vienna** has over 1,200 racks installed throughout its city boundaries. The cities of **Innsbruck** and **Salzburg** installed fully automatic bicycle parking garages (Velo-Mat) at their main train stations.

The Velo-Mat is gaining popularity in Europe.

Facilities provide space for many bicycles and are accessible via a chip-card, which opens a box that can accommodate a bicycle and other accessories such as luggage and shopping material. People can buy annual, monthly or one-time usage cards. This type of bicycle parking facility has been popular in Japan for several years and is increasing popular in European countries such as Germany, The Netherlands and Switzerland.

Salzburg also installed bike boxes, electrical secured bike racks at the train station, and 40 automatic bike lockers at its central bus station.

Facts from Switzerland

In Switzerland, concern for the environment among politicians and the public at large has resulted in a high standard of public transport with relatively low fares. Fifty percent of the cost to implement Bike and Ride facilities at public-transport interchanges are able to be grant funded as per current environmental protection legislation. Two-hundred fifty of the country's railway stations have bike rental facilities available with different types of bicycles that are less than a year old.

Winterthur

In the city center of Winterthur, bicycle parking is provided for over 3,000 bicycles including some covered facilities.

Only a few car parking spaces are available in the city center since on-street parking bays have been replaced by neatly marked bicycle parking spaces (for bikes which have stands).

Building regulations in Winterthur require all new developments and reconstruction projects to include bicycle parking provision within ten meters of the main entrance.

Facts from Japan

Since the 1970's, Japan's national and local laws have required bicyle parking facilities at or near rail stops.

A law without precedence anywhere in the world was established in Japan in 1981 requiring the Promotion of Bicycle Safety and the Provision of Bicycle Parking. The motives for the law were first, the high number of bicycle accidents and second, the severe obstruction of traffic resulting from the disorderly parking of huge numbers of bicycles, particularly at rail stations, called the phenomena of "bicycle pollution".[1)]

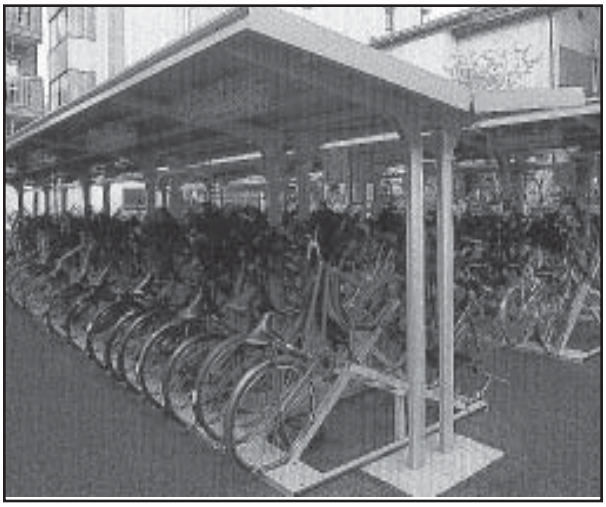
In Japan bicycles are considerably cheaper than in the United States and people worry less about them being stolen. Of greater concern is where they can be stored.

The Japan Bicycle Law sees to the improvement in quality and quantity of available bicycle parking by requiring bicycle parking for public use, encouraging better security systems, and requiring strategies to avoid abandoned bikes. Also required by law is the provision of federal and regional funding for private and public implementations. Wherever a certain amount of bikes are parked or expected, bicycle parking has to be provided in Japan.

The 1981 Bicycle Law was revised in 1994 under pressure from more than 200 local governments. Cities and towns have since declared cycle parking prohibition zones from which cycles may be removed by the city and after a certain time, be disposed of.

In 1994, a total of 2.3 million cycles were removed from railway stations of which 1.25 million were returned to their owners; 275,000 were used domestically as recycled bikes; 131,000 bikes were given to LDC's, and the rest were disposed.

According to the Japan Bicycle Promotion Institute, there is an estimated capacity of 3.5 million bicycle parking spaces at railway stations within approximately 9,400 designated bicycle parking areas. The Tokyo metropolitan authority alone spent 15.5 billion yen (140 million dollars) in 1995 to provide bicycle parking, remove bikes left in the open, and sponsor public relation campaigns to prevent bike abandonment.



An angled slide-on facility for many bikes (source: Bicycle Promotion Institute).

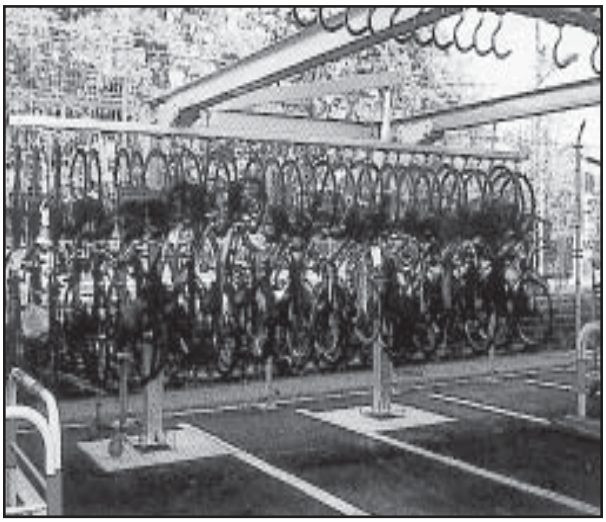
In Japan, half of all bicycle parking facilities are covered, ground-level parking structures; the remaining are uncovered parking lots. Japan's high land costs have spurred innovation in space-efficient storage. The majority of bicycle parking systems (bicycle parks) in Japan are either categorized as 'self-propelling' or mechanical. In a "self-propelling" facility, the bicycle is pushed from the entrance to the parking slot. These types of mechanical systems house bicycles on multiple levels. The average bicycle parking facility at rail stations holds over 270 bikes; some hold as many as 2,000 bikes each.[1)]

Automated bicycle parking facilities (which account for approximately one percent of total bicycle parking) include merry-go-round storage systems, dry-cleaner type circulating racks, vertical rotating palate systems, multiple-layer sus-

pension systems, and several types using cranes or robots to lift bicycles into overhead storage areas. Storage often involves vertically movable floor technology with high density capacity. In recent years, the development of underground-bicycle-parking-garages has spread.

Facilities are owned and managed by both private-and public-sector groups, including railroad companies. Stations offer "for fee" parking near the station and free parking a little further away.

Another approach used in Japan to prevent bicycle pollution is the Rent-a-Cycle system. This system of identical minicycles kept in parking lots and located around train stations supplies bicycles for commuting to and from stations for a small fee. As of 1996 there were about 30 rent-a-cycle facilities in Japan.



Vertically mounted bike parking facilities are also very popular in Japan (source: Bicycle Promotion Institute).

1) Bicycle Parking Systems in Japan, Japan Bicycle Promotion Institute, 1997.

FINAL STATEMENT

The lack of safe, secure bicycle parking facilities is a major contributing factor to why more people do not use their bikes to make short trips and to why more attention is recently being paid to bicycle parking planning. In addition, because a well-maintained bike is most likely to be stolen, many cyclists ride bikes with poor brakes and lighting. The result is often a drop in status of the bicycle and increased cycle accidents.

Another reason why more attention is now being paid to good facility planning is that randomly parked bicycles at busy destinations, get in the way of pedestrians, who have to slalom between parked cars and bicycles. Good storage can provide better safety for both pedestrians and cyclists. Finally, urban areas appear much friendlier to residents and visitiors when sidewalk clutter caused by bicycles is avoided.

Summarized below are the benefits resulting from the provision of effective bicycle parking facilities:

- ***Provision of proper bicycle parking facilities increases cycling and therefore has a positive impact on the environment by reducing the use of the automobile;***

- ***Bicycle parking requires far less space than automobile parking and in addition is much less expensive; a car parking space needs about 330 square feet of surface space verses 6-12 square feet for a bicycle;***

- ***Provision of bicycle parking at the workplace has health benefits for the employee and cost benefits for the employer;***

- ***Bicycle parking provided in retail-and commercial areas increases customers accessibility and therefore has a positive economical impact;***

- ***Increased bicycle parking at transit stations can significantly increase the transit market area; improved bicycle egress systems can provide expanded employment opportunities for low income inner city residents who are now cut off from access to growing suburban employment;***

- ***Bicycle parking facilities prevent sidewalk clutter and pedestrian incurring injuries caused by improperly parked bicycles;***

- ***Studies show that shifting one park-and-ride commuter to bicycle-and-ride saves an average of 150 gallons of gasoline per year, and shifting an auto commuter to bicycle-and-ride can save and average of 400 gallons of gasoline; shifting auto commutes of less than three miles can eliminate resulting poor air quality, due to the cold start phenomena.***

Providing bicycle parking facilities without carefully analyzing the various different needs and issues associated with their provision may be a waste of time and money. Location, placement and type and quality of the facility are equally as important as how many facilities are installed.

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