

INFRASTRUCTURE/ **PARKING****BICYCLE PARKING IN THE CITY CENTRE**

Overview

All cities serious about cycling should develop a strategy for bicycle parking in the city centre. A mix of dispersed small parking provision and large secure storage facilities will offer cyclists easy access to key urban destinations. Observation and needs analysis should determine locations, quantity and quality. As a result, this will attract more cyclists, improve the quality of public space and increase the city centre's attractiveness.

Background and Objectives

Function¹

Well-planned public bicycle parking facilities in the city centre offer cyclists safe and convenient parking opportunities near a mix of urban destinations. The location, the quantity and the quality of parking provision must match the needs of cyclists.

In addition, this reduces bicycle theft, improves cycling accessibility of the area, contributes to modal shift and keeps public spaces uncluttered.

Scope

All city centres need well-planned bicycle parking infrastructure. This is one of three indispensable components of the trip chain: storing at home, riding on a cycling network and parking or storing at destinations.

This may not seem obvious. After all, a bicycle is small and light, convenient to hop on and hop off and easy to dispose of. Just lean it against a wall or attach it to a lamppost, a traffic sign or a railing right in front of your destination.

Such informal parking may be charming in small numbers, in little villages or quiet neighbourhoods, but in the centre of a busy city we are faced with two problems.

- Large numbers of bicycles standing or lying around creates chaotically **cluttered space**. They block pavements and hinder pedestrians, and they visually degrade the quality of public space. This is a very real challenge today in cities with high levels of cycling. But starter cities with high ambitions for a cycle network must also plan for the increase in cycle parking demand.
- Again in cities, **bicycle theft and vandalism** are serious issues. Concern about theft and vandalism discourages people from cycling. It also makes people use old and badly maintained bicycles, less comfortable, less safe and less attractive. Consider the following results from Dutch surveys. Of all the people who never cycle into the city centre, 31% give fear of theft as the reason. Of all those who do not own a bike, around 25% gave fear of theft as a reason. And when their bike is stolen, 25% of cyclist cycle less or simply abandon cycling.

However, it would be wrong to see bicycle parking only as a problem to be solved or a nuisance to be eliminated. Such a view may simply lead to regulating and banning bicycles from city centres. Such a negative approach will be counterproductive and hinder the growth of cycling.

It is vital to consider **bicycle parking facilities as an opportunity** for city centres.

- Large numbers of informally parked bicycles should not be read as a problem but as a sign **strong demand** for more and better cycle parking provision.

¹ Additional sources for this fact sheet: CROW, 2001: *Leidraad fietsparkeren*; The Danish Cyclist's Federation, 2008: *Bicycle Parking Manual* (all diagrams taken from this last source).

- Well-organized bicycle parking **boosts cycling**. Cyclists are encouraged if they know that wherever they go they can count on finding adequate, sufficient, high-quality and safe bicycle parking. High-quality provision is also visual proof to all that cycling is taken seriously. Experience consistently shows that good-quality parking attracts latent demand.
- Indirectly, bicycle parking contributes to **boosting city centre attractiveness**. In combination with a cycling network, it improves accessibility for cyclists. It should be part of a general parking policy, aiming for a modal shift towards public transport and cycling. This way, car parking space can be freed up, inside buildings as well as in public space. Ten bicycles only need as much space to park on as one car.
- Cyclists **contribute significantly to the economic health of a shopping district**. In most cities, most shoppers do come by car. Many retailers conclude that car parking provision is a priority and may resist giving space to cyclists. Establishing the exact financial contribution of cyclists is hard. But research has shown that it would be wrong to neglect cyclists' economic potential. First, surveys show that retailers often underestimate the share of cyclists and pedestrians. Secondly, customers by car spend more per visit, but cyclists are more regular customers, living nearby. As a result, in some cities surveys have shown that cyclists actually spend more per visit on average than car users.

Implementation

Definition

Public bicycle parking in the city centre is the well-planned and monitored provision of publicly accessible parking facilities for cyclists. These include free parking opportunities, unsupervised racks or stands and supervised storage.



Image sources: T. Asperges, F. Boschetti, Dft

Bicycle parking needs careful planning

Generally speaking, **cycle parking must be integrated into all planning processes**. This is still quite a culture change in many cities. If we take cycling serious as a transport mode, cycling should be planned for in all new buildings and developments and in urban renewal schemes. After all, this is standard practice for car parking. There is no reason why it should not be standard for



cycle parking. Bicycle parking should logically be part of general municipal parking policy. It should also be remembered that a parked bicycle takes up about one tenth of the space of a parked car.

There are **no quick fixes**, no easy standard solutions for city centres. Bicycle parking provision must be carefully **tailored to local cyclist's needs**. If facilities do not respond to needs, they will not be used and be simply wasted. If there is not enough provision or in the wrong place or of the wrong kind, they will be useless. Two extremes should be avoided.

- One quick-fix approach is the **haphazard multiplication of small on-street parking facilities**. The objective is to quickly expand on-street parking supply to facilitate orderly parking. Small cycle racks and stands are installed wherever space is available. Quantity can indeed increase quickly. But this will hardly be efficient if quality is not considered and if location is simply guided by space opportunities instead of cyclists' needs. As a result, some racks may be well-used, others prove too small, and still others may remain empty. Sometimes bicycles will pile up right next to an empty rack, if the rack is of the wrong type or not conveniently positioned.
- Another quick-fix approach is the **overconcentration in one large indoor facility**. The objective is to get bicycles off the street and to reduce theft. Building a covered, secure (possibly manned) and often expensive parking storage facility seems like a high-quality solution. Often a fee will be asked. If it is well-located near a busy destination, it may attract numerous cyclists, mainly for average or long-term parking and owners of expensive bikes. But it will not get all bicycles off the street and may remain underused. Especially a cyclist who needs a quick short-term parking solution will not walk the distance to a paid-for storage facility. And obvious over-provision will provoke irritation.

Clearly, an **efficient and effective mix of provision** will be needed. This needs to take into account that each city-centre is **a uniquely mixed area**, comprising shops, employment, leisure, culture, education and housing. For each of these functions in isolation, standard indicators exist to define the necessary quantity and quality of parking provision². This will mainly be provided on their own grounds or indoors. But in the city centre, all of these occur together and most visitors will park in public space. As a result, we are faced with **diverse cyclist parking needs in public space**. Typically a city centre draws large numbers of visitors, short-term as well as long-term.

Cities just starting to provide bicycle parking will, very sensibly, put in public parking provision at major visitor destinations. But how to decide on the quantity and type of provision needed? A trial-and-error approach may work, if is combined with careful monitoring and quick adaptation to demand. But it is more efficient to develop first a well-founded strategic plan.

Because of all this, a **planned, area-wide policy** for public bicycle parking is recommended.

- A **careful local needs analysis** is indispensable.
- This makes it possible to efficiently **plan cycle parking locations, quantity and quality**.
- **Monitoring at regular intervals** is recommended to adjust provision to evolving needs.
- Cycle parking fits into an overall **parking and travel demand management policy**. Balancing the supply of car and bicycle parking can contribute to a desired modal shift.

Mapping supply, demand and required measure

The starting point is **observing and analyzing current supply and demand**. Since location is crucial, it is recommended to **make use of maps**, rather than tables or graphs. Even at low levels of cycling and parking provision, lessons can be learned from looking at where cyclists park and where they do not.

These are the steps in a well-tested approach, which can be repeated for monitoring.

- Define a **sufficiently large area**. Do not restrict the research too narrowly to the central area itself. Make sure to include all relevant destinations and parked bicycles, as well as opportunities for new storage facilities. Too large an area is better than too small.
- Divide the area into street **sections** of approximately 50 m, with squares as a separate section.

² See POLICY GUIDELINES ON INFRASTRUCTURE



- Count at **peak times** on a representative day, ideally from May to June or in September/October. One counting round of the whole area should be finished within an hour. The size of the area will then determine the human resources needed.
- For each section, **count the supply**: the number, the type and the quality of parking facilities (stand-alone, covered, supervised or automated).
- For each section, **count the demand**: the location and the number of parked bicycles; also indicate how many use a parking facility, how many are parked outside but next to a parking facility, how many are parked on their own away from a parking facility.
- For each section, consider **counting stray bicycles**, which take up parking capacity. The way to determine this is by marking all parked bicycles and coming back for instance a week later, to check how many have not moved. One simple way is to make a chalk mark on the tire and one on the ground just below: if chalk marks still correspond after a week, the bicycle has not moved.

Present the occupancy rate on a map or a series of maps. This can be done for the entire area, for subareas and for each section. Take into account the quality of facilities: bicycles parked next to empty provision clearly indicate the bad quality of the infrastructure.

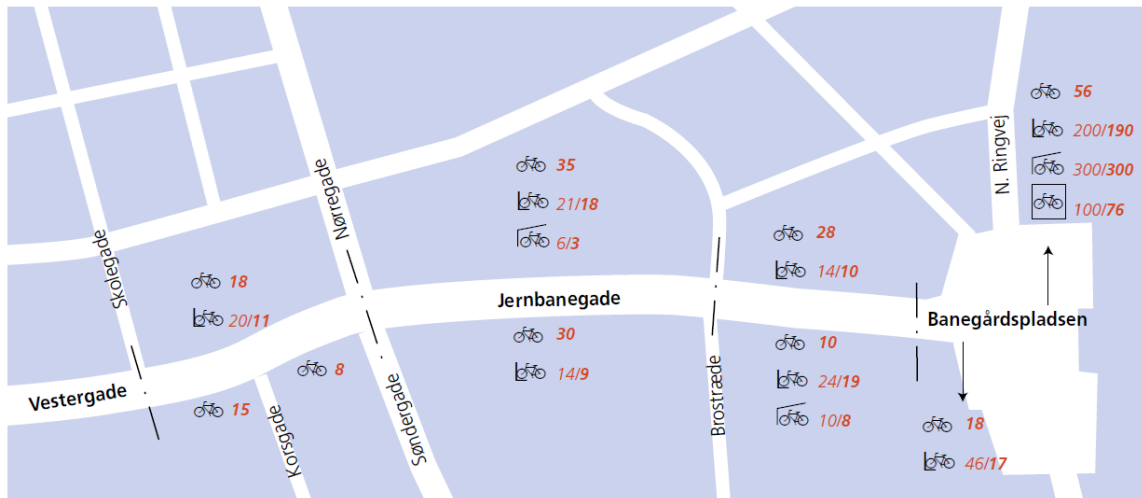
- An occupancy rate of more than 80% signals insufficient capacity. The 20% spare capacity is needed to reduce searching time for cyclists and to allow for bicycles blocking up the space next to them (because of shopping bags, unusual design etc).
- An occupancy rate of less than 50% is considered over-capacity.

Add to the map **current and future major destinations**.

- Draw in **magnets**, such as shopping areas, business districts, major interchanges, and leisure and culture destinations. This will clarify the spatial patterns of demand and under- or oversupply.
- Estimate the impact of **future developments**, in the central area but also residential developments within cycling distance of the city centre.
- Estimate the impact of **major traffic policy changes** (such as congestion charging, pedestrianizing etc.). Rolling-out a large scale cycling network over the next few years should result in a major increase in parking demand.
- Involve **cyclists'** in the initial analysis as well as in the subsequent monitoring. Their hands-on experience is invaluable in identifying difficulties and opportunities, desires and potential. Cyclist organizations often have clear priorities and strongly held ideas. Setting up a cyclist's panel requires more effort, but it allows a diversity of users to be heard: children, men and women of different ages, using the bike for shopping, work or leisure.

Then define the measures for a **cycle parking plan** and also indicate them on a map.

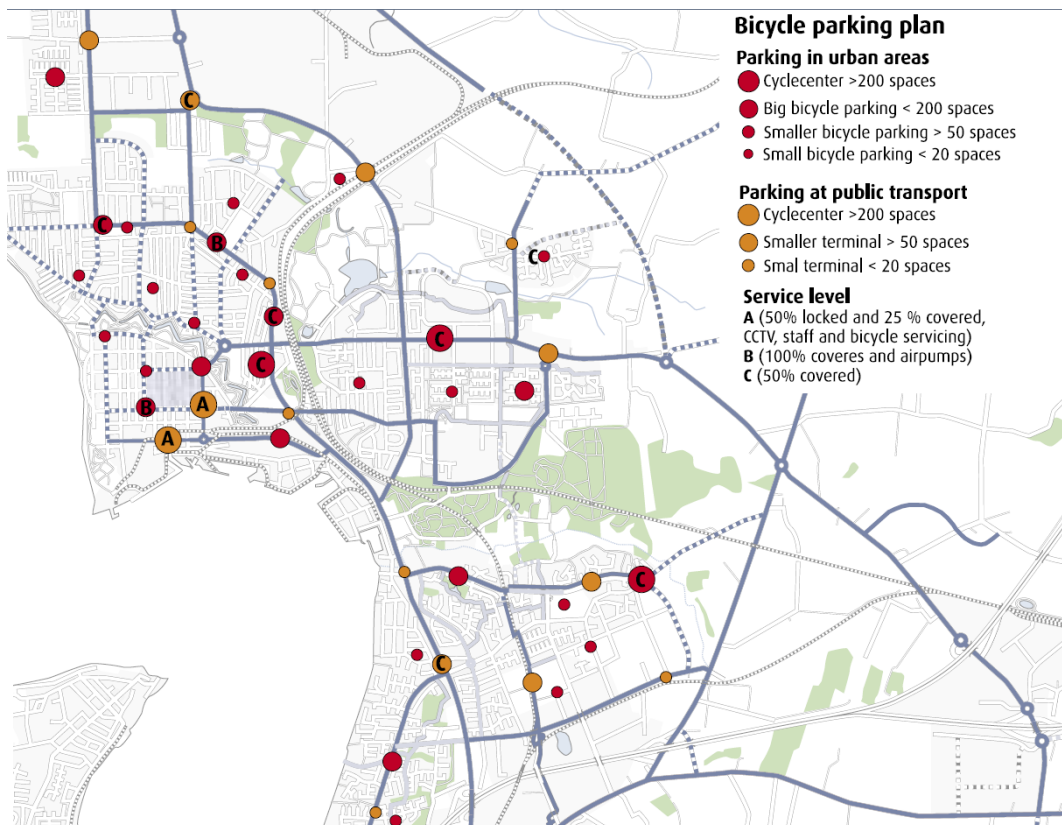
- **Increase or decrease** the supply area-wide, if the occupation rate is respectively over 80% or under 50%.
- **Relocate** the supply, if at some places it is overused, at others underused.
- **Adapt** the type of parking provision, if certain types of facilities are under- or overused.
- **Provide for suppressed demand**. Good quality cycling storage generates higher demand. It is recommended to provide 25% spare capacity, in addition to the estimated demand.



-  No rack
-  Rack
-  Covered rack
-  Locked, supervised and covered rack

Example of bicycle parking map of city centre. In a peak period the following is registered: Number of racks divided into 3 standards, ie rack, covered and locked/supervised, and peak load for 4 standards, ie no facilities, rack, covered, locked/supervised bicycle parking. The bold numbers refer to how many of the cycle stands that are used.

Example of a cycle parking observation map (Source: 2000, Collection of cycle concepts, DK)



Example of a bicycle parking plan: number of spaces, service level and location are indicated and related to major destinations and public transport hubs (source: DCF, 2008 Bicycle Parking Manual, DK)

Boosting demand by free supervised storage

Parking facilities come in roughly three broad categories. The table indicates their average user share in the Netherlands, where there is generally a well-planned mix of facilities available.

Unsupervised storage typically racks or stands in streets and squares	44%
Free parking outside of any facility	38%
Supervised storage facilities either manned, automated, equipped with CCTV or any combination of these.	18%

Since **supervised storage** is the highest service level, it has the **capacity to boost demand**, but **prudence** is recommended. The take-up from cyclists' is not easy to predict. Some guidelines based on Dutch experience.

- **Limit the ambitions** for supervised bicycle parking facilities. In Dutch cities, it is hard to attract more than 18% of cyclists to supervised storage, certainly in cities with a population below 100,000. In smaller cities, distances are shorter and centres serve more daily shopping needs, which means more short-term parking. Theft also tends to be a less of a problem.
- **Provide sufficient dispersed unsupervised storage.** Cycling visitors on brief visits (less than half an hour) will want to park in front of their destination, where they can often keep an eye on their bicycles. To discourage randomly parked bicycles in shopping streets, simple and small parking systems should be found almost everywhere.
- **Survey cyclists** to define demand for supervised storage. Relevant questions are: quality of the vehicle, age, frequency of visits to the city center, duration of visit to the city centre. Generally, supervised storage will be more used by owners of expensive bicycles, by elderly people, by occasional visitors and by long-term visitors. The table shows averages for the Netherlands. The percentage values reflect the high cycling rates of CHAMPION CITIES, but what is important are the relative differences between yes and no.

Population characteristics	Average use of supervised bicycle storage facility	
	Yes	No
Good/new/expensive bicycle	18%	0%
Over 40 years of age	21%	12%
Weekly visits or more frequently	20%	12%
Visits of 1 hour or more	20%	8%

- **Locate supervised storage facilities in or on the edge of the core shopping area.** This should be within a radius of 150 m from the heart of the area. Create a comfortable and attractive walking route, with a good visual relationship with the shopping area.
- **Use free supervised storage as a magnet.** The effect can be significant, not only because it is free, but also because it saves time for paying and checking in and out. This way, the storage also attracts a higher rate of short-term parking cyclists. To strengthen the effect, free supervised storage should be located near major destinations for short-term cyclists, such as a department store or city administration. A well-documented case in Apeldoorn (NL) showed that when storage was made free, the number of users doubled, and around 20% of new users did not cycle into town before. In this case, free guarded storage is funded from car parking revenues.
- **Use regulation of free parking as a last resort.** Banning cycling or bicycle parking is a restrictive measure. Cyclists will only accept it if it seems logical, if high-quality alternatives are available and if they perceive that there is vigorous enforcement. Clusters of smaller parking facilities or reserved areas should be fairly dense, in order to convince short-term parking cyclists. A ban will work better if the area is smaller.

Recommendations for lay-out and design

On-street parking needs to fit into existing or new urban space. **Lay-out** needs to combine **efficiency** and **high-quality urban design**. Only if a parking facility is convenient, attractive, safe and visible for the cyclist will it be used. At the same time, integrating bicycle parking harmoniously into public space is a challenge and an opportunity for urban designers. Here are some guidelines.

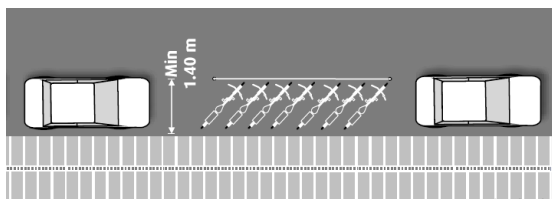
- Locate parking provision in the **natural access path** of the cyclist. Ideally, bicycle parking works like this: you cycle towards your destination; close to the destination you catch sight of a clearly marked bicycle parking facility, which is easily accessible; you park and secure the bike and continue your path to your destination. Imagine the worst-case scenario: you arrive at the destination, arrows lead you on a detour to a hidden underground facility, from which you then have to walk back to where you arrived: chances are that you will simply park your bicycle on the street. If there are several access routes, prefer the one most used, or put in a facility on each of them. As a simple rule of thumb, a place where many bicycles are spontaneously parked is most likely a good spot to establish parking provision.
- Define **distance to destination based on function, time and service levels**. The longer the stay, the farther a cyclist will be willing to walk. At one extreme, there is the cyclist on a 5-minute errand, who may use a simple stand if it is less than 15 m from the shop. At the other extreme is the day parker, who will put a premium on security and may walk up to 100 m to his destination. The graph below from the Danish Parking Manual summarizes this.
- Make sure the bicycle parking facility is in a **visible location**, well-lit and with lots of social control. This makes them easy to locate and enhances social safety. Ideally, signage should not be needed. If parking is covered or underground, the entries and exits should be clearly visible, inviting and sufficiently wide for two cyclists to cross, at least 2 m. At the same time, cycle parking should not dominate space or be a form of visual pollution. This is an urban design challenge.
- Clearly **delineate the parking area**. This can be done through a line marking, different surface material or street furniture such as bollards or a low wall. The delineation is a strong incentive to parking your bicycle there and nowhere else. Access should be easy, and a simple and subtle effect should be created that fits in with the urban environment. In a pedestrian area, the bicycle stand can be a structuring element.
- Consider **extra facilities and services**, ranging from compressed air, a drinking fountain, storage for a helmet and kit to a toilet and a bike repair shop. These can be used at fairly large parking locations. In case the parking facility has to be located relatively far from destinations, such extra provision can be a way to attract cyclists to use it.
- In streets, **turn car-parking spaces into bicycle parking**. In a traditional street with a parking lane, it is easy to take out one or two spaces and create room for eight to twenty bicycles, if these are parked at an angle. Such spaces are very easily accessible from the street and from the pavement, and they leave the pavement unobstructed. For angled parking, a depth of 1.4 m is sufficient, for perpendicular parking 2.2 is needed.
- In traffic-calmed streets, **use pavement extensions for bicycle parking**. As a traffic calming measure, pavement extensions are used to narrow the carriageway, especially on street corners. This creates the opportunity for bicycle parking stands. These should be carefully located, so as not to become an obstacle for pedestrians and the mobility impaired.
- Create long-term facilities preferably at street level and covered.
- Bicycle parking can create **urban and object design opportunities**: racks or stands can be specially designed, and entrances to storage facilities can become landmarks. Any design should however remain functional and simple, not overdesigned. If street furniture is specially designed, bicycle provision should be included, to integrate it visually and also upgrade its presence.



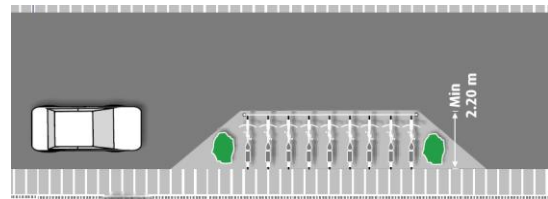
Parking on the natural access path (source: DCF, 2008 Bicycle Parking Manual, DK)



Acceptable distance from bicycle to various destinations (source: DCF, 2008 Bicycle Parking Manual, DK)



Car parking space turned into bicycle parking space (source: DCF, 2008 Bicycle Parking Manual, DK)



Bicycle parking area on a pavement extension. (source: DCF, 2008 Bicycle Parking Manual, DK)



image source: D. Dufour



image source: D. Dufour

 Bicycle stands which can be combined with matching street furniture also reinforce the positive image of the bicycle parking facility.



Photo: Vekso



Photo: Vekso

The Black Diamond in Copenhagen
At the Black Diamond in Copenhagen, Vekso's model SHL hoop stand is used.

In addition to the bicycle stands, the area is equipped with, for example, benches, litter bins and plinths in the same design.

The area around the Black Diamond has an air of stylish luxury about it and helps encourage a good bicycle parking culture.



Photo: Vekso

*Parking design integrated into street furniture design
(source: DCF, 2008 Bicycle Parking Manual, DK)*

Considerations

Strengths

Well-planned bicycle parking in the city centre

- Attracts more cyclists and adds value to the cycle network as a whole
- Improves the quality of public space, by avoiding cluttered bicycles and by opportunities for well designed bicycle parking provision
- Increases city-centre attractiveness.

Weaknesses

Well-planned bicycle parking in the city centre requires resources for observation, analysis, strategic planning and implementation. For all of this sufficient political support is needed.

Alternative options

Banning cycle parking or cycling as a whole from the city centre requires enforcement and will discourage cycling.