

BIKE PARKING INFRASTRUCTURE GUIDANCE

DUBLIN CYCLING CAMPAIGN

**V1.0
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REFERENCES

Dublin Cycling Campaign research into bicycle theft, 2014.

Dublin City Council Draft Development Plan 2011-17

Dublin City Council Cycle Parking Strategy Report, Halcrow Barry, 2015

National Cycle Policy Framework (Ireland) 2009

National Cycling Manual (Ireland) 2011

London Cycling Design Standards 2015

Cambridge Cycle Parking guide 2010

Hackney Council Cycle Parking Guide 2014

Transport initiatives

Cover Image

Cargo bike image and diagram: HOE Consulting (www.HOE360Consulting.dk)

Figs 12, 13 & tables & drawings in appendix: Transport Initiatives

Transport Initiatives is an independent transport planning consultancy focussing on sustainable transport in general and cycling in particular. Their clients range from local authorities & government departments to train operators and anyone requiring sustainable transport solutions (www.transport-initiatives.com)

Dublin Cycling Campaign

Dublin Cycling Campaign are an independent, voluntary group lobbying local and national government to bring about improved conditions for cyclists and greater recognition of the benefits of cycling (www.dublincycling.ie)



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1. INTRODUCTION

Cycling is becoming increasingly recognised for the contribution it can make as a sustainable and healthy form of transport for trips around our towns and cities. Increased numbers of cyclists can contribute to solving the growing problem of congestion, take pressure off public transport, and contribute to an improvement in public health and the environment.

Good bicycle parking may be what persuades commuters to travel by bicycle and public transport rather than jumping in the car. However, whilst there is a growing understanding of what makes for good cycle parking in the public realm, little thought has been given to what should be done where most journeys begin and end i.e. in the home and workplace.

Dublin Cycling Campaign's recent research showed that theft and fear of theft is one of the biggest barriers to growth in cycling. The research also highlighted the lack of secure bike parking, particularly in apartment blocks, as a key contributor to bike theft and as one of the main reasons for apartment owners not owning and using a bike.

For residences, especially apartment buildings in Dublin, simple but robust measures can allow occupants rely on cycling as a means of getting around, and release valuable land which would otherwise be reserved for car parking.

For employers, improving the quality of cycle parking is the most immediate step they can take to encourage cycling among their staff, and the one most likely to yield quick-wins. Providing good quality cycle parking can greatly enhance the attractiveness of a work site and help increase cycle use. Cycle parking is vastly cheaper than car park provision, since one car parking space can provide sufficient space for 8 to 10 bicycles.

This guide aims to reflect best practice based on available evidence whilst taking into consideration the need to balance competing land use demands.

This guide is aimed at:

- Architects and landscape architects
- Developers and their agents
- Transport planners and roads engineers
- Planning engineering staff of the local authorities
- Employers wishing to encourage and support cycling to work
- Property Management Agencies & Owners Management Companies

¹ "Bike Theft Survey Results | Dublin Cycling Campaign." 2015. <<http://www.dublincycling.ie/cycling/bike-theft-survey-results>>

Bike parking in Irish cycling policy

While the guidance in existing Irish cycle policy documents is generally accurate and valuable, it's arguable that it does not adequately reflect the challenging security context of Dublin that was illustrated by recent research. We feel that more robust and specific guidance is needed for new developments and refurbishments of existing developments.

Below are Dublin City Council's bike parking standards from the 2017-22² draft Development Plan:

16.10.1 Residential Quality Standards -Apartments

Cycle Parking:

In the past, there has been an under-provision of secure cycle parking in apartment complexes in Dublin. This has led to bicycles being stored in apartments and on balconies potentially detracting from visual amenity and increasing maintenance costs for communal areas. The quality and quantity of cycle parking provision in apartment developments should encourage residents to adopt cycling as a sustainable mode of transport. All new apartment developments shall provide a minimum of 1 cycle parking space per unit. Generally, cycle parking should comprise of Sheffield stands or similar allowing the frame and wheel to be locked and be located in a secure sheltered cycle compound with adequate lighting and convenient access to the street.

Other policy documents with references to bike parking include:

National Cycle Manual (NTA, 2011)³ & National Cycling Policy Framework 2009⁴.

² "Dublin City Development Plan | 2016-22." 2010. 16 Aug. 2016 <<http://dublincitydevelopmentplan.ie/>>

³ "National Cycle Manual." 2015. 15 Aug. 2016 <<https://www.cyclemanual.ie/>>

⁴ "National Cycle Policy Framework -Smarter Travel." 2012. 15 Aug. 2016

<http://www.smartertravel.ie/sites/default/files/uploads/0902%2002%20EnglishNS1274%20Dept.%20of%20TransportNational_Cycle_Policy_v4%5B1%5D.pdf>

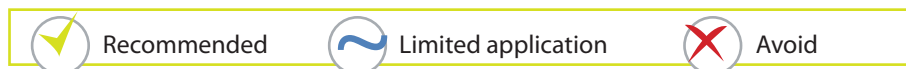
2. DESIGN

If the design is one which signals quality, convenience and order, most cyclists will choose to park their bicycle there. Good design influences behaviour.

A number of factors must be taken into account in order for cycling to be useful, notably:

- Location
- Accessibility
- Personal security
- Long and short stay parking
- Maintenance
- Signage
- Detailed design
- How much parking is needed, taking account of future growth
- Cost/funding

Recommended key:



Conveniently Located

Cycle parking should be sited in a manner which encourages the use of a bicycle as first choice for short trips and preferably within the footprint of the building. It should be placed as close as possible to the main entry/exit points both at the origins and destinations of all journeys.

Where cycle parking shares space with car parking the cycle parking should be sited closer to the entrance/exit than any non-disabled car parking. Ideally it should be in well-lit places that have high levels of natural surveillance and CCTV if possible.

This reduces the opportunity for vandalism/theft and inspires confidence to cycle to the destination. Cycle parking should not be hidden away behind buildings or tucked away in the corner of a car park as this discourages use and allows thieves to work out of view.

Accessible and easy to use

Cycle parking should be easy to get to, with no inconvenient detours, steps, steep slopes or narrow access ways. The facilities provided should be easy to use by all members of the community at all life stages without the need to lift or drag the bicycle to park it. Additional space for tandems, trailers, 'tag-alongs' etc. should be considered on a case by case basis. The spacing of stands should allow easy use without the danger of bicycles becoming entangled with each other.



Fig. 1
Stands 1000mm apart allow cyclists to lock their frames in comfort



Fig. 2
Stands too close together only leave room for 1 cyclist per stand

Safe and Secure

Cycle parking areas should be designed so that cyclists feel personally secure. They should be in areas with natural surveillance and be well lit. In the case of locked structures, cages are more popular with users than closed rooms.



Fig. 3
Underground,
caged & well lit



Fig. 4
Ground level and
sheltered



Long term / overnight & short stay parking

Whether in the public or private domain long term/overnight parking should be covered. Consider above ground where possible (accessible, natural surveillance).

1. Long term / overnight parking



Fig. 5
Ground level,
secure, caged
bike parking

2. Short stay parking



Fig. 6
Underground,
secure, well lit,
caged bike parking

Fig. 7
For residents or visitors, conveniently located at entrance to apartments



Well managed, monitored and maintained

Parking should be the subject of a funded maintenance regime that ensures the parking area is kept clean, free of graffiti, well-lit and the parking equipment properly maintained. It is essential, therefore, that as far as possible cycle parking is low-maintenance, easy to use and self-explanatory to owners and tenants. Advice on the use of cycle parking should be provided to owners and tenants.



Fig. 8
Code or fob access to secure sites



The use of smart card and proximity keys is recommended for secure access to communal sites, however, this needs to be well managed to remain effective.

A clear method for identifying, tagging, removing and disposing of abandoned bikes is needed. The notice in Fig. 9 gives seven days notice of removal and 60 days storage before disposal.



Fig. 9
Removal of
abandoned bikes

Signage

The signing strategy in an area should help people to find the cycle parking. It encourages bike parking in the designated area and discourages fly parking to railings, posts etc.



Fig. 10
Bike parking sign

Parking requirements for Cyclists

Typical User	Particular Needs
Residents	Close to entrance, covered & with passive surveillance. Secure, with a proportion in a locked cage. Visitor parking may be free standing racks.
Commuters	Convenient, (less than 50m from entrance), secure, covered with passive surveillance. Visitor parking may be free standing racks.
Shoppers	Convenient, (ideally <25m from entrance) & secure (open stands). Room for loading & trailer bikes. Safe from traffic. Easy to use.
Children	Well overlooked. Stands with added lower crossbar. Safe from traffic.
Families	Plenty of room for non-standard bikes and luggage. Safe from traffic.

Detailed Design

The standards below are required whether in a locked cage/compound or free standing outside a cage/compound.

The design of the stand has to ensure peace of mind, even for short stays. The stand should facilitate the use of ‘D’ locks and conventional chains/cables, provide support for the whole bicycle and allow both frame and at least one wheel to be secured. The racks should be well spaced to allow ease of access and reduce the risk of getting oil on clothing.

Cycle stands should be able to withstand general vandalism including kicking, without failure of the structure. Exposed fixings should be tamper resistant and the metal should be of sufficient quality to resist cutting with manual bolt cutters.

'Sheffield' Design

The simplest rack meeting the required criteria is the 'Sheffield Stand', an inverted 'U' of steel tube with the ends fixed into the ground. This stand is preferred for several reasons.



Fig. 11
Sheffield design



Benefits of Sheffield Stand⁵ :

- Liked by users
Easy to use and no lifting required. Supports the bicycle well and provides opportunities to lock back and front wheels as well as the frame.
- Parks two bicycles to one stand & accessible from both ends if aisles are provided.
- Non-damaging to bicycles if plastic coated or similar.

The NTA Manual recommends 1.2 to 1.5m spacing between Sheffield stands. For the Dublin context, where space is often restricted, a spacing of 1.0m is considered adequate. It's recommended that at least one of the rails is set into the ground as shown in figure 12 above. To accommodate children's bikes some of the racks should have an additional rail approximately 200mm below the top bar (see fig 12). In areas where there may be visually impaired people, end racks in a row of racks should have a low level 'tapping bar' (fig 12).

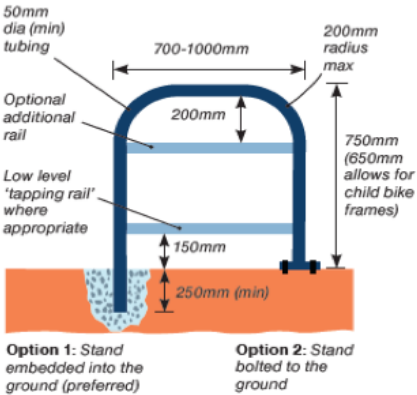


Fig. 12
'Sheffield' type stand

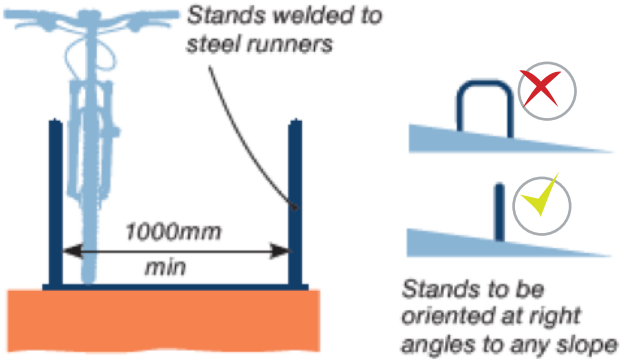


Fig. 13
'Toast Rack' of
Sheffield stands

Solutions to be avoided

'Wheel racks', concrete blocks with slots and other types of racks that grip the bicycle by its wheel do not provide the required security or support and can damage wheels.



Fig. 14
Wheel racks allow the quick release wheel to be undone and the rest of the bike to be taken



Fig. 15
Wheel racks provide little support with bikes falling against each other and buckling wheels

Wheel rack types fail on all counts:

- **Support**
Don't support bike frame so bikes tend to topple over, damaging wheels.
- **Security**
Tend to be relatively easy to cut through with bolt cutters or hack-saw.
- **Locking of frame to rack**
Wheel racks are designed for the wheel rather than frame to be locked to the rack. Racks are tightly packed making it very awkward to lock frame to rack.

Other Designs

There may be situations where solutions other than Sheffield Hoops are suitable. As for any solution however, it should meet the criteria set out in the 'Design' section.

Where high capacity cycle parking is required for example, there are models of two-tier racks which give adequate support and secure locking for the cycle. Two-tier racks should be gas assisted to make lifting and lowering the racks easier. Some cycle users find these two-tier racks difficult to operate, so additional low level parking should also be provided.



Fig. 16
Two-Tier Rack





Fig. 17
Vertical Rack



Cargo Bikes

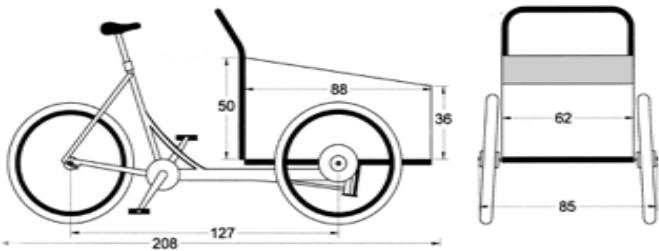
It is recommended that at least 5 per cent of all spaces should be capable of accommodating a larger cycle. For example, Cargo bikes can range from 208cm to 243cm in length to 85cm width. The most practical method is to ensure that stands are provided in short runs with large gaps between runs to allow a larger cycle to be secured to each end stand.



Fig. 18
Cargo Bike Parking



Fig. 19
Christiana Cargo Bike



How much parking is needed?

The table below lists Dublin City Council’s established cycle parking requirements for various development types.

Location	Dublin City Development Plan
Retail Trade and Shops	1 space per 150m2
Restaurants and Cafés	1 space per 150m2
Residential Flats	1 space per unit
Second / Third Level Education	1 space per 3 students
Hotels	1 space per 10 bedrooms

New users, i.e. new residents or employees, should be made aware of the location, nature & function of the cycle parking provided. The process of issuing of keys, smart cards and proximity devices etc. should be transparent to all users.

3. ESTIMATED COSTS & SUPPLIERS

We have provided below some estimated costs, based on a number of sample quotes we received for bike parking in the Dublin area in 2016. This may be helpful for organisations to get a rough ballpark figure for implementing a solution on their property.

Sheffield Hoops – stand alone		
	Stainless Steel *	Galvanized Steel
Cost per Sheffield Hoop (supply & installation)	€200	€140
Bikes per hoop #	2	2
Cost per bike space	€100	€70
* Excludes cost of lock or electronic card access system.		

Sheffield Hoops + bike cage*		
	Stainless Steel *	Galvanized Steel
Cost per Sheffield Hoop + bike cage (supply & installation)	€400-500	€340-440
Bikes per hoop #	2	2
Cost per bike space	€200-250	€170-220
* Excludes cost of lock or electronic card access system.		

4. APPENDICES

Basic dimensions

The aim of cycle parking should be to encourage more cycling, more often. The purpose of this section is to ensure that adequate room is provided for both cyclists and bicycles when using the parking provided. This requires an understanding of the space needed by a cyclist to get to the cycle parking and to ensure that the cycle parking itself is adequately spaced; not just to accommodate use but also to encourage its use. Cycle parking should also take account of all life stages and abilities and recognise that utility cycling takes place all year round.

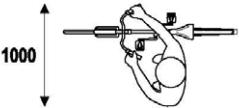
An average

The width of average adult average wearing normal winter clothing is taken to be 700mm. This compares with the normally accepted width of a mounted cyclist as 750mm.



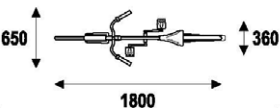
A cyclist pushing a bicycle

Cyclists generally push their bicycles holding the handlebars. They also instinctively lean the bicycle slightly towards themselves to avoid hitting their shins with the pedals and so 1000-1100mm is a general guide to the width needed. These figures make no allowance for clearance between fixed objects such as wall or parked bicycles.



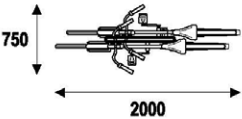
Design bicycle

Bicycle size may be affected by the addition of such features as child seats, panniers and baskets; all are regularly encountered where cycling is common. These rarely add much to the overall width but can have a significant impact on the ease with which the bicycle can be locked to a stand and the space needed between stands.



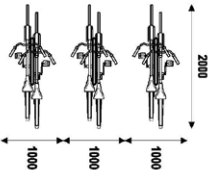
Two parked bicycles

In order to avoid a clash of handlebars and pedals the second bicycle to be parked will be parked slightly to the front or rear of the first. This gives an overall length for 2 bicycles of 2000mm. The effective overall width of 2 bicycles parked on the stand may be taken as 750mm. This figure makes a small allowance for the width of a bicycle frame and the stand but doesn't take into account the presence of panniers, baskets or child seats. The amount by which a bicycle sticks out from the centre line of a Sheffield stand may be taken as 375mm.



'Footprint'

The minimum 'footprint' of two bicycles parked at a Sheffield stand should be taken as 2m x 1m. This maybe use to calculate the space required for a given number of stands.



1. Spacing between stands

Stands should always be sufficiently far apart to allow users to park and lock their bicycles with ease. The minimum spacing between Sheffield stands should be 1000mm. This distance is always measured from the centre line and at right angles to the longitudinal axis of the stand, even when stands are at an angle to a wall or kerb line.

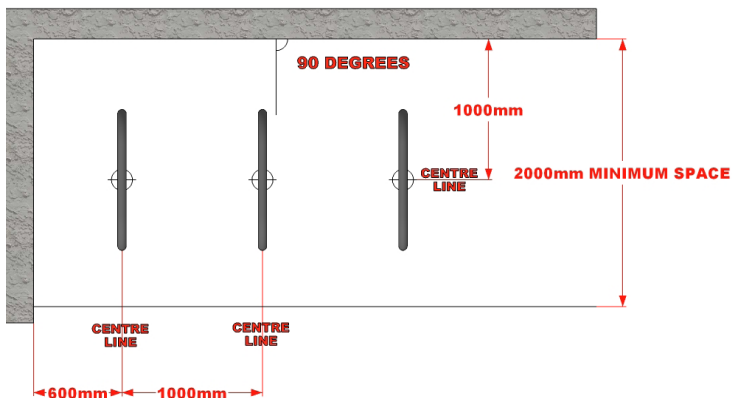


Diagram (a)
Stands at right angles to a wall

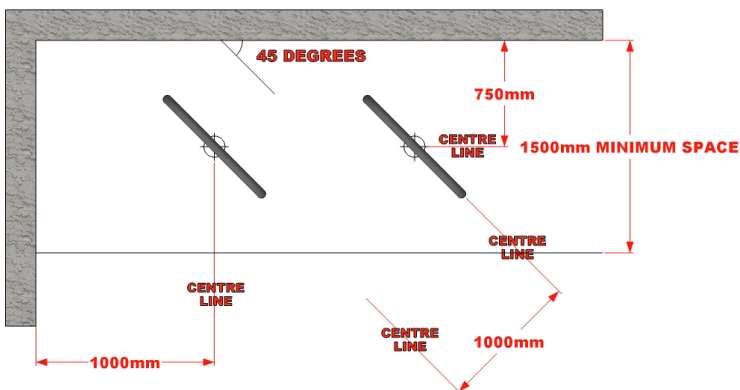
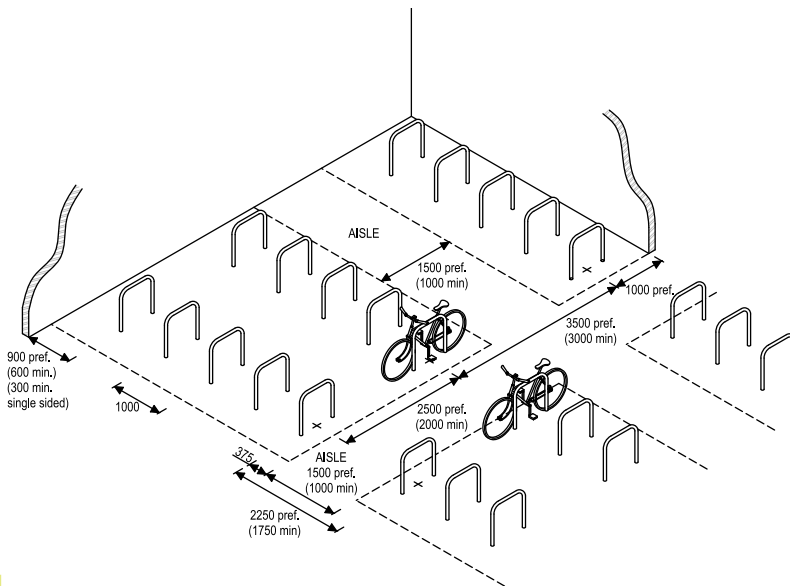


Diagram (b)
Stands at 45 degrees to a wall

2. Aisle layout

It is essential to provide aisles between every two rows of Sheffield stands and at regular intervals between groups of stands. The aisles should be a minimum of 1000mm (equivalent to 3000mm between the centres of stands) to allow cyclists to get past parked bicycles and turn to park (see diagram 4 below). Where large numbers of stands are provided and two-way flows of cyclists pushing their bicycles are likely at peak times (e.g. in large halls of residence), aisle widths should be increased by at least 500mm.



Aisle layout

3. Turning Space

Designers should ensure adequate space has been provided to allow a cyclist conveniently to get to and from the cycle parking. The following four diagrams illustrate the outer swept paths of common manoeuvres.

Four common manoeuvres are illustrated:

- Pushing a bicycle through a right angle (to left and right)
- Turning through 180° to reverse direction (to left and right)

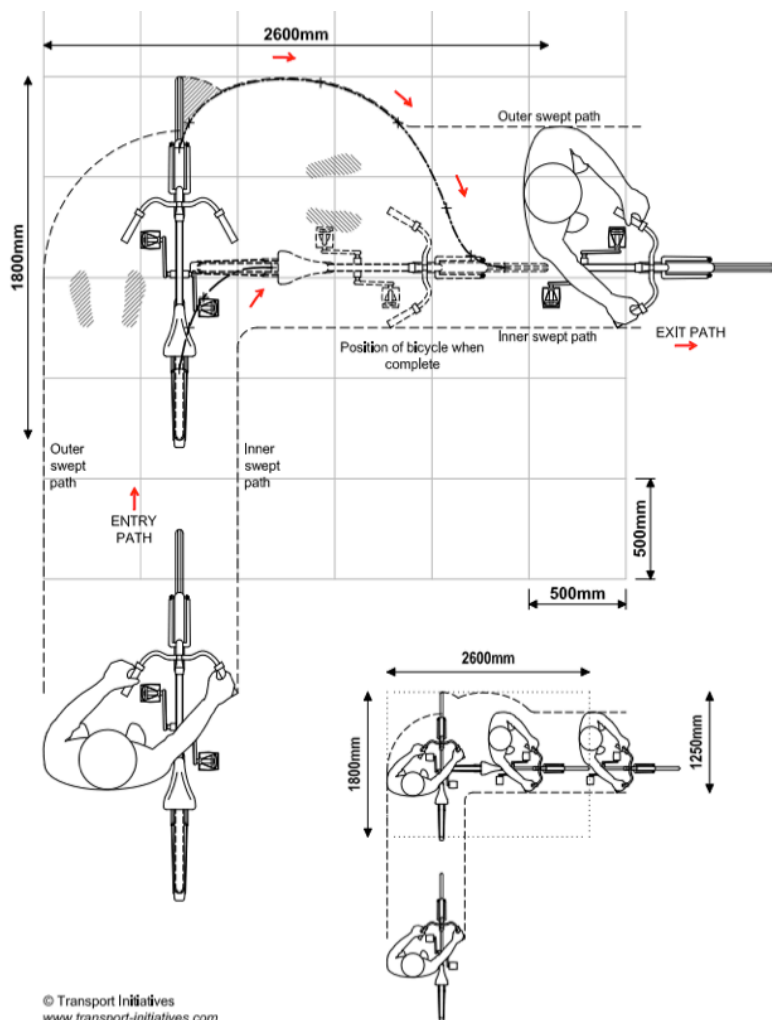


Fig. 22
Cyclist stood on left
of bicycle turning right

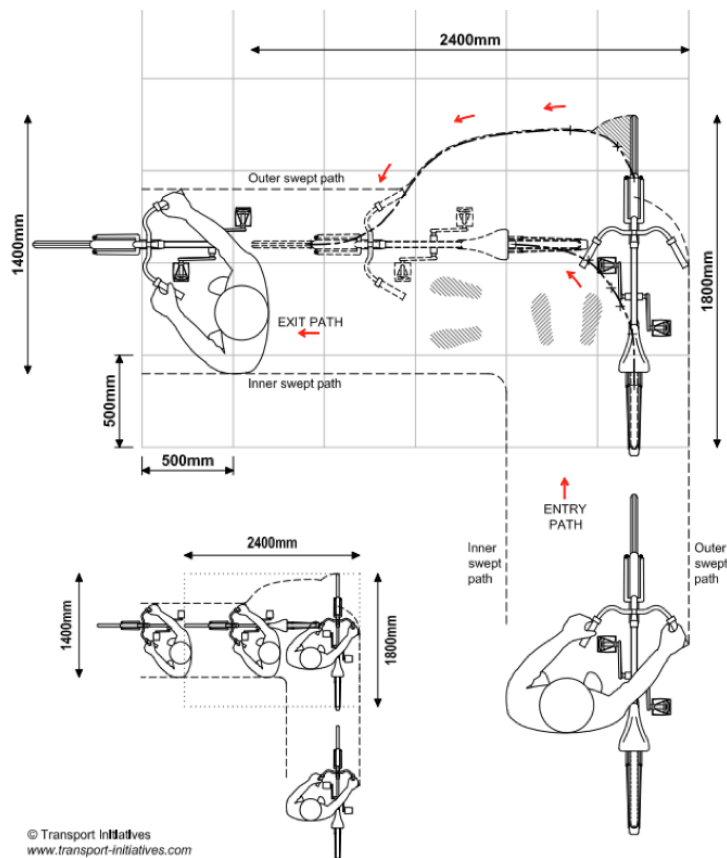


Fig. 23
Cyclist stood on left
of bicycle turning left

4. Steps and ramps

Where access to the cycle parking area is derived by means of steps, these should always be accompanied by a wheeling ramp, preferably on both sides of the steps to allow users to pass when going in and out and to wheel their bicycles on their natural side whether going up or down.

The slope of any ramp (and steps) should not exceed 50% (1 in 2) but should always be as shallow as possible to promote ease of use.



5. Door Widths

Any door or gateway that cyclists have to pass through to gain access to parking must be at least 900mm wide; preferably 1000mm. Communal doorways should be a minimum of 1200mm.

The turning diagrams may be reversed to represent a cyclist standing on the right hand side of the bicycle. It should be noted that the outer edge of the 'envelope' is generally created by the elbow/shoulders of the cyclist on one side and either the handlebars or the front wheel on the other. The latter occurs when the bicycle is leant over during the turning manoeuvre.

Whilst the space required to turn a bicycle will vary with the size of the cyclist and his or her ability to handle their bicycle without lifting or dragging it, the drawings represent the amount of free space needed to achieve the various manoeuvres in comfort. No allowance has been made for the need for clearance between the swept paths and walls and other fixed points. It is suggested that 150mm (100mm minimum) is provided to avoid damaging paintwork, doorways etc.

5. CASE STUDY

Below is an example of a good bike parking facility with both visitor and overnight parking.

Built	Appts	Residents (est)	Bike parking area 1	Type of Bike Parking area 1	Bike Parking area 2	Type of Bike Parking area 2	Bike theft
2014/2015	250	750	Casual/visitor parking above ground near main entrance	Sheffield Hoops	Secure cage in underground car park.	Wheel racks	No

A. Visitor/short term bike parking:

Above ground, close to entrance to apartment complex, uncovered, with natural passer-by surveillance.



Fig. 24
Bike racks are secure stainless steel, Sheffield Hoop type stands.



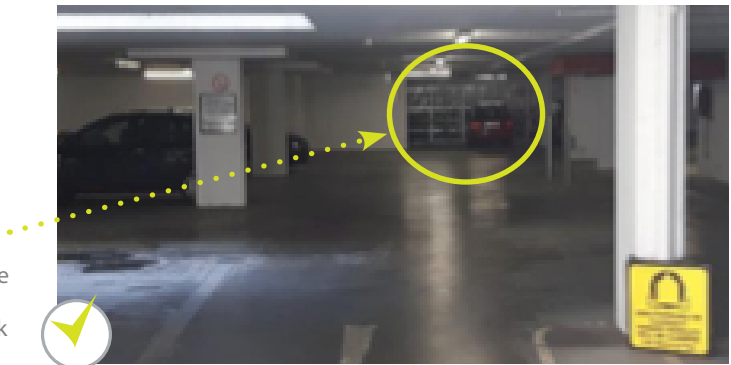
B. Long term/overnight bike parking:

Secure cage, with electronic access for cyclists, conveniently close to entrance to underground car park. The cage is well-lit giving cyclists a sense of personal security.

Fig. 25
Well lit cage
parking



Fig. 26
Well located cage
parking, directly
opposite car park
entrance

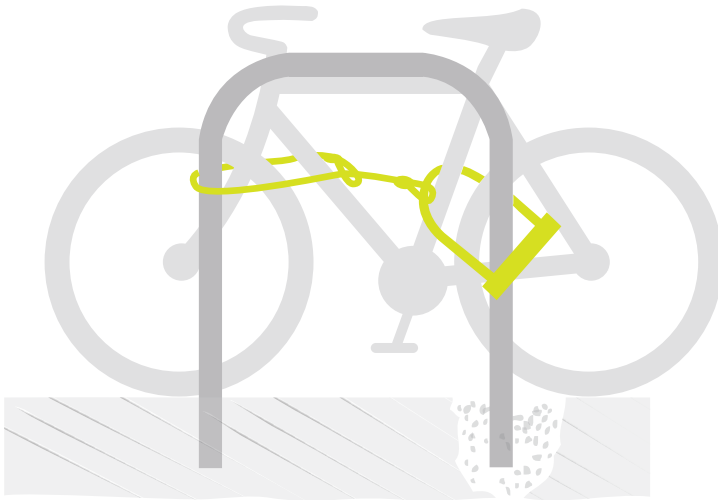


Comment:

Good standard facility with casual/visitor bike parking using Sheffield hoops close to the entrance of the complex where there is natural surveillance from passing residents. While the parking is not covered we don't feel this is necessary for short term bike parking.

Recommendation:

Sheffield hoops to replace the wheel racks in the underground bike cage.



6. FURTHER INFORMATION

Dublin Cycling Campaign; www.dublincycling.ie



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www.facebook.com/dublincycling