DESIGN AGAINST CRIME RESEARCH CENTRE

University of the Arts London Central Saint Martins

Don't give Thieves an Easy Ride:
A Design Against Crime Practice Review

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www.bikeoff.org

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What is BikeOff ?

BikeOff is the DAC research strand addressing bicycle theft and secure cycle parking provision.

BikeOff is investigating how designed and ad-hoc cycle parking solutions are complicit with crime i.e. linked to misuse and abuse/ theft of bicycles.

www.bikeoff.org

www.bikeoff.org

Why BikeOff?

The department for Transport, National Cycle Strategy (1996) aimed to increase cycle usage x4 by 2012.

17% of cyclists experience bicycle theft. Of these 24% stop cycling and 66% cycle less often.

Transport Research Laboratory 1997

www.bikeoff.org

Why BikeOff?

Cycle theft seriously impedes cycle usage and the benefits that cycling has to offer the public:

* Quick
* Healthy
* Affordable
* Non-polluting

www.bikeoff.org

Why BikeOff?

1600 premature deaths per year due to poor air quality.

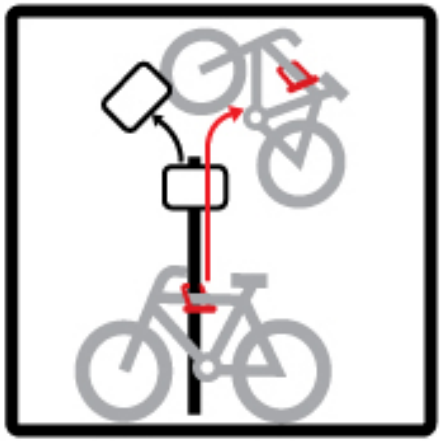
Mayor of London, 2006: Cleaning London's Air – The Mayors Air Quality Strategy, London: Greater London Authority

www.bikeoff.org

Bike theft perpetrator techniques: establishing reality

lifting

Thieves lift the bike and lock over the top of the post to which the bike is secured. If it is a signpost then the thieves may remove the sign to lift the bicycle clear. They may replace the sign afterwards. Sometimes the post itself is not anchored securely and can be lifted clear of the bike and the lock.



Always lock your bicycle to a 'closed structure' that is well secured to the ground. If you must lock to an 'unclosed structure' then make sure it is more than 5 metres high and well secured to the ground (thieves will stand on shoulders to pass your bike clear if the structure is low enough).

levering

Thieves will use the gap between the stand and the bike left by a loosely fitted lock to insert tools such as jacks or bars to lever the lock apart. Thieves will even use the bike frame itself as a lever by rotating it against the stand or other stationary object it is locked to. Either the bike or the lock will break – the thief doesn't mind which – after all, it's not their bike!

Always fit your lock so that as much of the aperture within the lock is filled by the stand and bike (and maybe helmet). This will make it harder to insert tools between the lock and the stand. **Never lock your bike by the 'top tube' (AKA 'crossbar') alone** as this will allow for the bike frame to be rotated against the lock.

Bike theft perpetrator techniques: establishing reality

striking

Given the opportunity thieves may use a hammer and cold chisel to split a securing chain or lock.

Always ensure your lock is fitted so that it cannot rest upon the ground or other immovable surface. This will allow the lock or chain to move if it is struck, diffusing the force of the strike and keeping your lock or chain in one piece.

cutting

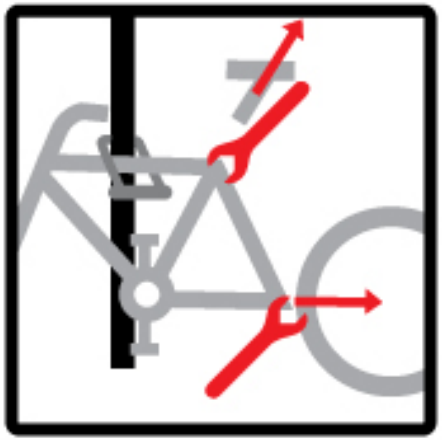
Thieves are known to use tinsnips, bolt cutters, hacksaws and angle grinders to cut their way through locks and chains to steal bicycles.

Don't make it easy for thieves. Some locks, such as coil or cable type, can easily be cut using readily available hand tools. More robust cutting equipment can be difficult to defend against. Expect to spend up to 20% of the value of your bike on your lock. Look at www.soldsecure.com and manufacturer guarantees and security ratings to buy the best lock you can. **It is best always to use two locks to enable you to secure both wheels and the frame of your bike to the stand**. If you buy two locks go for different types e.g. a strong D-lock and a sturdy chain lock. This means that if the thief has the tools to defeat one type they may not be equipped to deal with the other.

Bike theft perpetrator techniques: establishing reality

unbolting

Thieves know how to undo bolts and quick release mechanisms. If you lock your bike by the wheel alone this is likely to be all that will remain when you return. If you lock only your frame then a thief may remove your wheel(s). If you leave your wheel-less bike to pick it up later then the thief will likely return before you do and remove the rest of the bike if circumstances allow.



Always lock both wheels and the frame of your bike to the stand and remove any quick release accessories such as saddle and wheels. If you only wish to carry one lock then secure skewers are a good idea. These are available from most good cycle shops and do not allow unauthorised removal of wheels, meaning you only need to secure your frame to the stand.

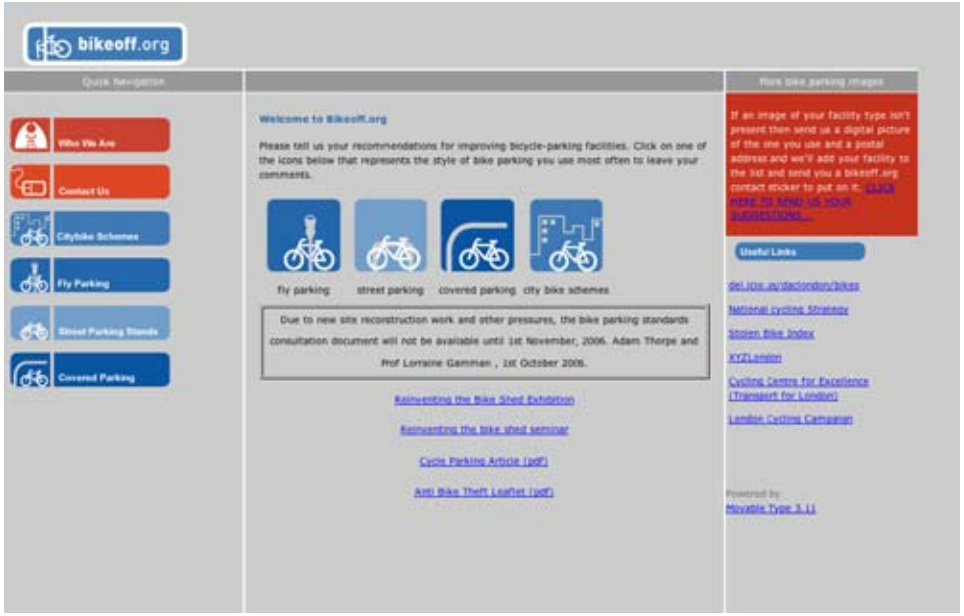
picking

Thieves can insert tools into the lock mechanism itself and 'pick' it open.

Most good locks are designed to resist this technique. Check that yours is one of them. Also, make it harder for the would-be thief by securing your lock in such a way that the mechanism is hard to get at. Tightly secured to the bike and stand and facing into your bike. Whilst this makes things a little more difficult for you it will make it a lot more difficult for a lock picker.

Bikeoff Weblog

Launched at International Cycle Show
London 2004



Holborn Gateway Cycle Parking Project

July 2005 – March 2007

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Camden

Transport for London

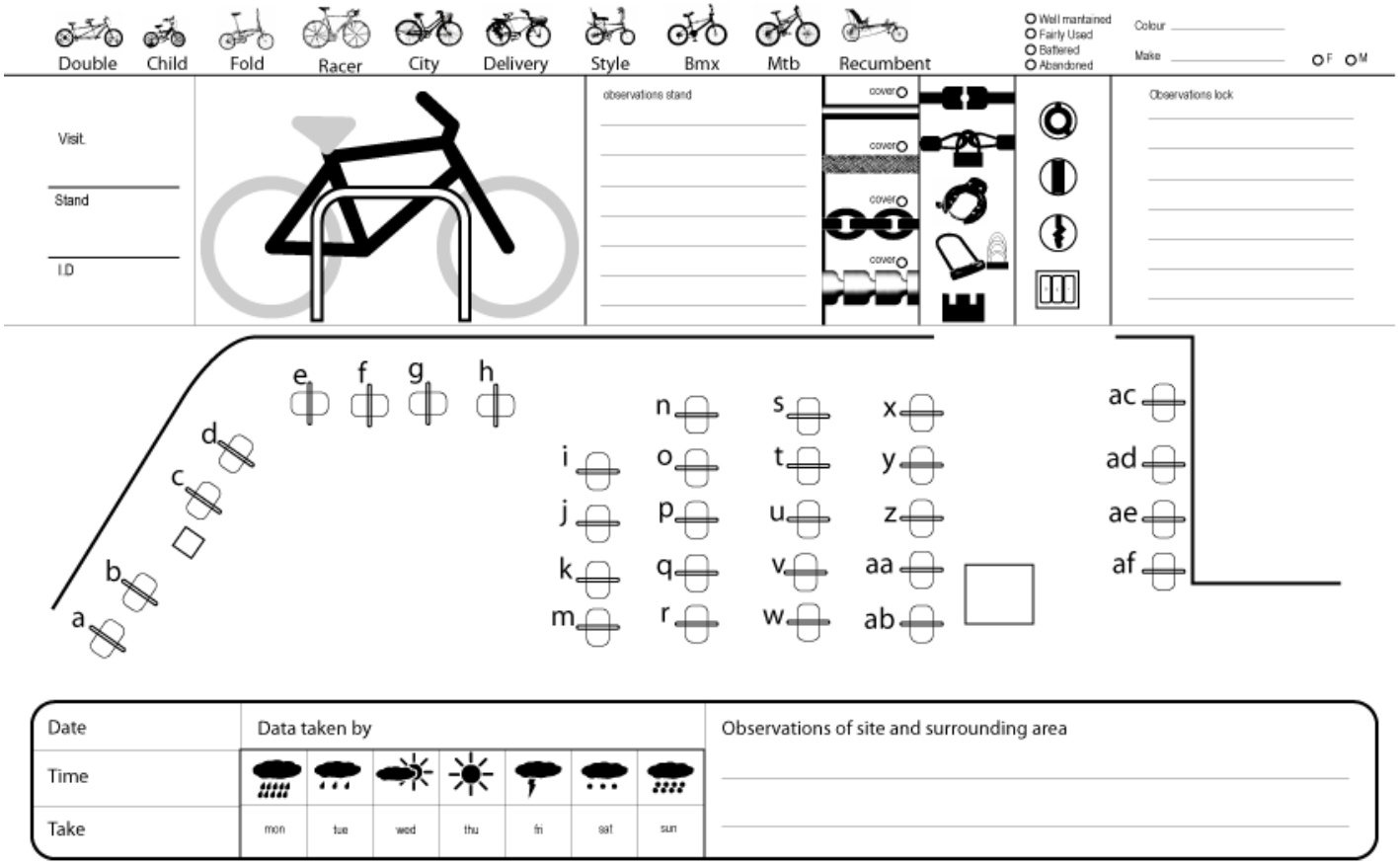
www.bikeoff.org

Project Description

• Research and Observation	July 2005 – March 2006
• Analysis and brief construction	March 2006 – Sept 2006
• Design and prototyping	Sept 2006 – Dec 2006
• Implementation and testing	Dec 2006 – March 2007

Site observations

8500 observations of ‘locking’ events



Site observations

We know that:

- stands closest to the college are the most popular
- **weather doesn't effect locking behaviour**
- 75% of users have bikes of standard 'diamond frame' design - *including top tube*

Site observations

We know that:

- stands adjacent to abandoned bikes are least popular amongst users - *'broken bike' effect*
- 11 bikes reported stolen; a further 7 thefts were known but not reported; Camden police suggest 40% of thefts are reported; more than 1 bike stolen a week on average
- none of the thefts were observed, prevented or recovered by CCTV

Site observations

We know that :

- 1/3 of cyclists we spoke to were new cyclists
- majority use 2nd hand bikes (Brick Lane)
- 75% of new cyclists didn't know the name or function of their bikes components

Site observations

Locking data :

- 87% used 1 lock
- 12% used 2 locks
- 1% used 3 locks

Site observations

- Using 2 locks to secure a diamond frame bike to a Sheffield stand there are 180 potential locking combinations.

Site observations

Locking data :

- 22% locked front wheel
- 31% locked back wheel
- 19% locked no wheel and
- 6% locked front & back wheel

Site observations

Of 180 possible locking methods :

- 72% use one of 7 methods
- 53% lock only 1 wheel
- 19% lock only the frame

Interventions

Project aims to use research to inform solutions in the following areas:

Information Environment: methods of communicating security issues and user best practice to cyclists and other users of the space.

Surveillance and Guardianship: schemes that will help cyclists look after our own bikes and/or work with existing services to do so.

Cycle parking furniture: designing more secure user-friendly cycle parking furniture.

Lighting and Site Improvement: the design of more user-friendly, abuser unfriendly sites for cycle parking.

Interventions

Information Environment: methods of communicating security issues and user best practice to cyclists and other users of the space. (signage/messaging/ integrated?)

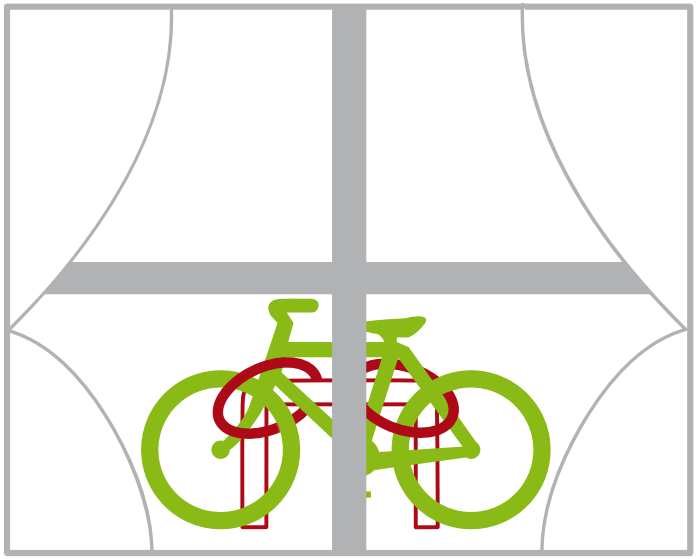
Interventions

Surveillance and Guardianship: schemes that will help cyclists look after our own bikes and/or work with existing services to do so.

The bikeoff weblog and site observations have shown that users do not put their trust in cctv

Little Brother : Bosch

- Self surveillance
- System mgmt – registered users
- Triggers and alerts
- Response – physical/sensory?



Interventions

Cycle parking furniture: designing more secure user-friendly cycle parking furniture.

Short stay (0-2 hrs)
Medium stay (2-6 hrs)

Bikeoff research indicates a requirement for stand design to address:

- Reducing opportunity for insecure locking practice
- Support bike from falling and front wheel from falling to side
- Increase security of ‘1 lock’ users

Bikeoff design proposals are being tested on street prior to 'roll out'



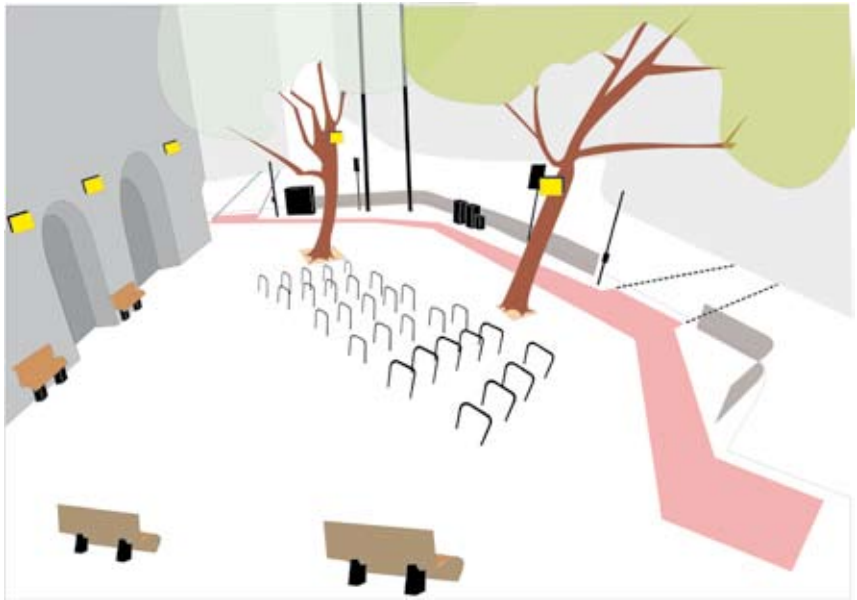



www.bikeoff.org

Interventions

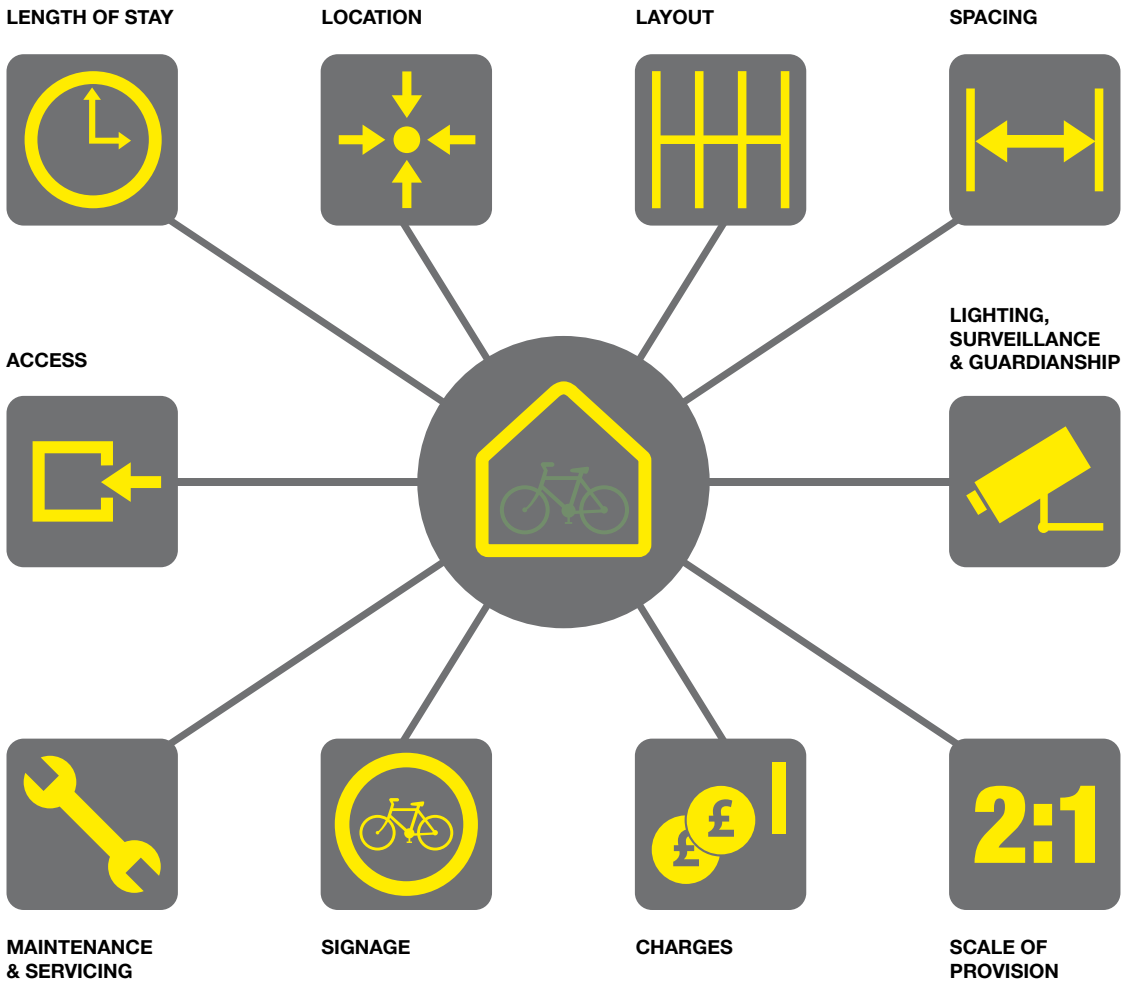
Lighting and Site Improvement : the design of more user-friendly, abuser unfriendly sites for cycle parking.

- Pedestrian flows (phoneboxes)
- Cyclist access – conflicts?
- Site lines
- Lighting
- Service – site mgmt and maintenance – broken
- 'Place making' – Holborn gateway
- Other users – college users/ office workers/ tourists/visitors
- Way-finding

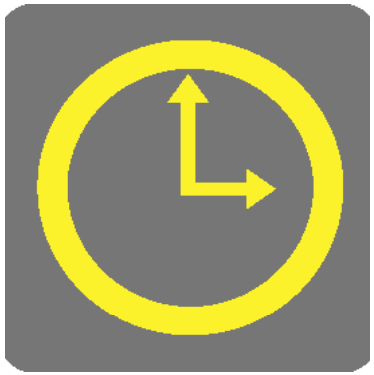


Cycle parking environment guidelines

- Desk based research
- Best of breed guidelines
- Bikeoff research
- TFL
- MAID engagement and feedback



Cycle parking environment guidelines



Length of stay should be considered in relation to both duration of locking procedure and security afforded by a facility. The optimal objective is a provision that is quick, easy to use and highly secure. Different user journeys require different types of parking provision. There are troublesome tradeoffs and compromises to be made between ease/ speed of use and security.

1. LENGTH OF STAY

1.1 It is appropriate to consider that the longer the duration of stay the greater the responsibility of the parking provider to offer greater cycle security for the user within the parking provision. Also to supply appropriate information about how to use the provision effectively.

1.2 Providers should be aware that often sites must accommodate more than one type of user and so provide for more than one 'length of stay'. In these circumstances it is necessary to establish the anticipated demands of users and provide facilities that accommodate this usage accordingly.

1.3 In all cases parking should be quick, easy and hazard free in access and use. However, it may be appropriate for the procedure to park a cycle to take longer where length of stay is longer and higher levels of security are afforded.

1.4 Short-stay parking (0-1 hour) is often appropriately located on street as close as possible to the destination it serves.

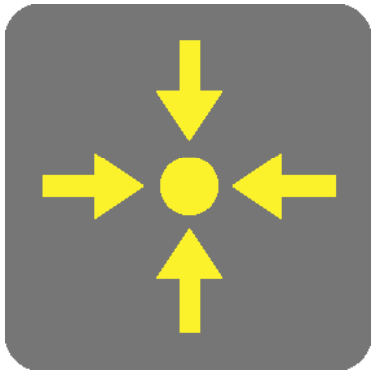
1.4.1 Where multiple destinations are accommodated the cycle parking should be provided in small clusters at frequent spatial intervals within the streetscape.

1.5 Medium stay parking (1-6 hours) is often located on street integrates additional security within the design of the parking used and/or within the spatial environment Where multiple destinations are served medium stay cycle parking should be provided in small clusters at frequent spatial intervals within the streetscape. In all other contexts, stands should be grouped so as to allow easy monitoring.

1.6 Long stay parking (6 hours plus and/ or overnight) requires high levels of security.

1.6.1 Where possible long stay cycle parking should be located off street with some controlled access. Stands should be grouped so as to allow easier monitoring.

Cycle parking environment guidelines



'Flyparking' (informal parking) is a useful indicator of inadequate, inappropriate or insufficient cycle parking provision near to a destination

2. LOCATION

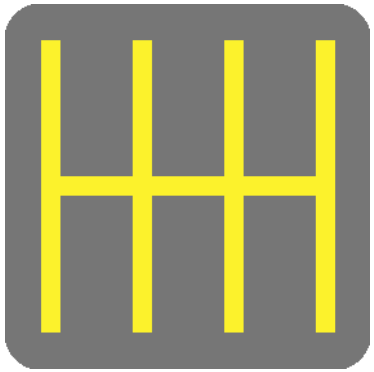
2.1 Cycle parking should be located as close as possible to the destination. it serves (<25 meters for short stay and <50 meters for longer stays in secure facilities) on the same side of the road and readily accessible from the entrance.

2.2 Locate parking so it is easy for new users to find and visible to passers by and security staff within the destinations served.

2.3 At educational establishments, workplaces and residential developments, cycle parking should be provided within the site, and some should be off-street, and if possible internal for longer stays.

2.4 Ensure hazard free and easy access by locating facilities close to the point where the cyclist has to stop cycling. This will avoid conflict with pedestrian and traffic flows and minimise the distance cyclists are required to wheel their bikes.

Cycle parking environment guidelines



Plan for expansion and demark the parking area to avoid conflict with other site users.

3. LAYOUT

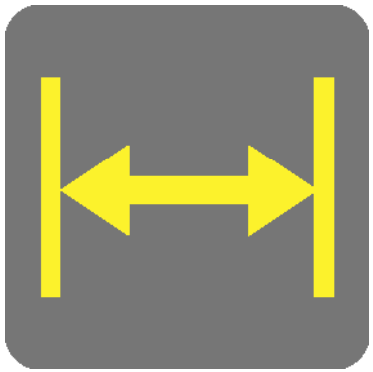
3.1 Plan for expansion. Where possible leave space to add stands as use increases, ensuring there are some spare parking spaces at the busiest times.

3.2 Allow safe and easy access to parking without damage or hindrance to other users, pedestrians or traffic.

3.3 On-street, demarcation of parking areas is essential to avoid hazarding pedestrians, particularly the visually impaired. Raised sets, tactile paving or tapping rails may be appropriate.

3.4 If you cycle parking has to be on a slope, align stands across the slope, to stop bikes from falling or slipping.

Cycle parking environment guidelines



Typically 8 standard bikes can be parked in the space of 1 car.

4. SPACING

4.1 Allow approximately 1m² per bike for 'pocket' schemes and 1.5m² per bike for schemes that include access aisles within the cycle parking area.

4.2 Where possible, leave 1200mm between stands that allow parking on two sides, 1000mm is acceptable where space is limited. For stands located parallel to a wall or perimeter allowing only single sided use, a spacing of 300mm from the wall or perimeter of the parking area is necessary.

4.3 For stands located perpendicular to a wall or perimeter, allowing double sided use, a minimum spacing of 900mmis required between the wall and the front of the stand.

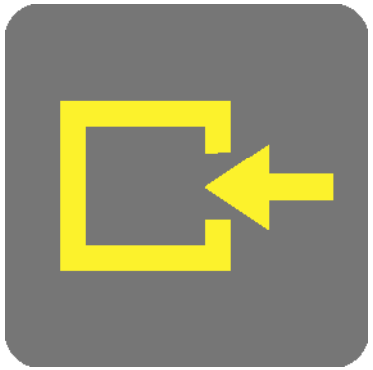
4.4 Standard bikes require a minimum parking area of 1850 long and 500mm wide.

4.5 Where cycle stand design allows handlebars to overlap, sharing the same space, a parking width of 400mm per cycle is acceptable.

4.6 Aisles of access, between rows of stands, should be a minimum of 1200mm wide.

4.7 Stands can be placed at an angle of 45º or staggered to reduce the footprint of cycle parking.

Cycle parking environment guidelines



Easy access promotes usage.

5. ACCESS

5.1 Consider site topography (railings, curbs, steps, pedestrian crossings, direction of traffic flow etc.) to ensure ease of access.

5.2 The facility should not compromise the safety of cycle parking users, nor that of others sharing the site (pedestrians, traffic etc).

5.3 Always provide enough space for a bike, rider and panniers to access the stands, including when the facility is in use.

Cycle parking environment guidelines

Theft may be deterred if bicycle thieves think they can be seen. Passers-by or security personnel may provide 'natural surveillance'. Lighting and surveillance promote usage by creating confidence amongst users, particularly those who have to access the facility at night.

6. GUARDIANSHIP, SURVEILLANCE AND LIGHTING

6.1 Where possible, position racks in front of windows so parked bikes are visible to owners from within the building the parking serves.

6.1.1 Locate stands where it is quite obvious that someone is keeping an eye on them.

6.1.2 Where possible make arrangement for existing security personnel, or other Capable Guardian within the space, or site served to assume guardianship of the cycle parking facility.

6.2 CCTV may provide a deterrent to thieves, but is only as effective as those who monitor it.

6.2.1 For CCTV to be effective, monitoring and response protocols need to be established with regard to cycle security in the area covered.

6.3 For any surveillance to be effective the facility needs to provide clear sightlines from inside and outside the facility.

6.4 Lighting should cover parking and access routes and highlight stand location.

6.4.1 Ensure an even level of light throughout the parking facility: avoid high contrast shadows and 'dark corners'.

6.4.2 Lighting must be maintained. Failed lighting indicates a neglected facility and will detract from usage and promote vandalism.

Maintenance and servicing is an essential element of any cycle parking provision and must be budgeted for on an ongoing basis. Research shows that cycle parking stands bordering those supporting damaged and abandoned bikes are least likely to be used (broken bike effect).

7. MAINTENANCE AND SERVICING

7.1 A site manager responsible for overseeing maintenance and servicing should be identified for any cycle parking facility.

7.2 Damaged or vandalised cycles within a facility signal insecurity of cycle parking to potential users and thieves.

7.2.1 Dumped bikes must be removed.

7.3 Arrangements are necessary for routine inspection, maintenance and clearance of abandoned bikes and other debris from the site. On-street parking is exposed to the elements. Moving parts require more maintaining as do electronic and key operated schemes.

7.3.1 Site managers should actively monitor the performance of the site in terms of security and fitness for use and adjust the provision as necessary.

7.4 Appropriate cycle parking can help to minimise maintenance.

Effective and informative signage is essential in attracting users, especially occasional users and tourists. Recognized signage conveys the image of a planned and managed scheme.

8. SIGNAGE

8.1 The Traffic Signs and General Directions signs manual has a series of prescribed signs for cycle parking on the public roads system. Consider department of transport traffic signs regulation 735.1 or 735.2 (1982 or later).

8.2 BikeOff research continues to assess what constitutes appropriate cycle parking signage considering maximum effectiveness and minimum cluttering of information environment.

8.3 For a parking facility to be successful it must be easily noticeable.

8.3.1 Signage should be clearly visible, concise and understandable even without comprehension of written language.

8.4 Signage may also be necessary to inform cyclists of how to use the facility or stands:

8.4.1 Indicate levels of risk/ appropriate usage (time of day - long/ short stay)

8.4.2 Communicate local knowledge and good practice in terms of:

8.4.2.1 consideration (do not lock through another bike)
8.4.2.2 safety (avoid obstructing passageways) and
8.4.2.3 security (locking advice)

Charging facilities that accept some liability for security will be most successful. The National cycling strategy identified cycle security is a key issue amongst cyclists when considering parking options.

9. CHARGES

9.1 On-street parking should be provided free of charge.

9.2 Off-street, secure, covered cycle parking may typically charge 50p a day.

9.3 Coin operated schemes are a bad idea as they promote theft and vandalism.

9.4 Integrating cycle parking charges within wider public transport charging schemes, such as Oyster (London), will increase ease of use, add credibility to the facility and promote cycling as an integral part of public transport systems.

9.5 Those charging schemes, which allow multi-site and multi-modal usage will be most successful.

9.6 Cost incentives should be considered to promote regular and long term usage.

Cycle parking environment guidelines

Recommended scales of provision vary according to local authorities. Typically, residential parking allocates spaces against number of bedrooms, business parking against number of employees and other usage against floor space. In London, The Mayor's Transport Strategy expects authorities "to require developers, wherever practicable, to install secure cycle parking"

10. SCALE OF PROVISION

10.1 Authorities should consider s.106 and other planning agreements to secure arrangements to mitigate gaps in provision.

10.2 Design in space for expansion. Anticipate increases in demand on cycle parking requirements.

10.3 Provide enough parking at any one time to allow for current usage demands, plus 30%, ensuring some empty spaces at peak times.

10.4 Over-provision of parking can give the impression of an under-used facility, which deters further use.