Design Against Crime (DAC) Research Centre

Design Against Crime as Socially Responsive Design for Public Space

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1. Why Design Against Crime?
Crime is a barrier to sustainable development as acknowledged by the UN and most domestic governments and impacts on public well being in the following ways:

i. Environmental
ii. Ecological
iii. Emotional
iv. Economic
i. Environmental impact

Actual crime, as well as fear of it, can operate to determine the aesthetics of, and our interactions with, the environments we live in.
i. Environmental impact

Vulnerability-led design responses, or too much emphasis on security can promote fear of crime (and each other) making people paranoid.
ii. Ecological impact

Crime trends often follow consumer trends. Crime is a voracious form of planned obsolescence - it has the potential to rival fashion.
iii. Emotional impact

Crime militates against well being. Prof. Layard (LSE) argues if we don’t feel safe we are unlikely to feel happy despite economic prosperity.

Prof. R. Layard Lessons from a New Science, The Penguin Press, 2005
iv. Economic

Money spent on policing crime and dealing with the consequences of crime and vandalism could be better spent on essential infrastructure (health, education, transport and culture).
2. About Us - DAC Research Centre at UAL
DAC Research Centre at the University of the Arts London aims to

1. To reduce the incidence and adverse consequences of crime through design of products, services, communications and environments that are ‘fit for the purpose’ and contextually appropriate in all other respects;

2. To equip design practitioners with the cognitive and practical tools and resources to design out crime; and

3. To prove and promote the social and commercial benefits of designing out crime to manufacturing and service industries, as well at to local and national government, and society at large.
DAC’s design and research process is:

* Socially responsive

* Multi-disciplinary and consultative

* Iterative and User and Abuser focused

* Practice-led
Socially Responsive.

We target crime problems that stand as a barrier to the progress of social and ethical agendas.

Our current focus is on bag theft (mobile property theft) that detracts from enjoyment of public spaces and public transport, and bike theft that detracts from cycle use.
Multi-disciplinary.
We bring together researchers, designers, architects, planners, criminologists, engineers, manufacturers, anthropologists, the police and other stakeholders to assess design tools and design proposals to ensure they are effective and appropriate.
Iterative and User and Abuser focused.
The iterative process is linked to a user-centred design model. It is constantly re-evaluating and improving design thinking based on user feedback and expert advice. We extend this model to address mis-use and abuse to ensure designs keep pace with ‘adaptive criminals’.

Practice-led.
Our practice-led research visualizes its outputs.
We try to show as well as tell what designing against crime can deliver.
2001 Don’t Tempt Me: Milan
2001 Don’t Tempt Me: Barcelona
2002 Stop Thief: RIBA and Designers Block
The safeguard of property has played a powerful role in shaping history. Wars, revolutions, and appeasement have been justified by the need to have or defend possession of countries, social systems, and planets. The fear of theft and destruction of property have stimulated the invention of many archaeological devices.

Urban planners and architects have incorporated visible protective barriers into their designs that recall meets and city walls from the past. Several high-tech contemporary solutions to protect buildings, however, have been rendered invisible to the average person. To protect against car bombs, for instance, excavated ditches ensure the collapse of sidewalks under the unusual weight, and trap the car at a safe distance from the buildings. Designers have sometimes tried to disguise protection under a decorative veil. Beautiful facades exist to deflect and dissipate the impact of a bomb (or a building), lion fences topped by cute fuzzy rabbits, elegant bar chairs modified to accommodate hosts for parties, to protect against their theft; delicate rings that become brass knuckles for self-defense; teakside tables that can be turned into baseball bats and shields. Humor and delight are often used as a way to exercise the tension.

While the need to protect our belongings is as old as civilization, the idea of identity theft is more recent. Kings and princes once attested their identities with seal rings, while ordinary people presented passports, identity cards, or passports that were relatively hard to counterfeit. Today, identity theft has become rampant as we entrust our identity to passwords and to the goodwill of impersonal data banks. Almost as a consequence comes the need to protect one's identity and beliefs—whether by wearing a personalized necklace, acquiring a tattoo, or signing a name. Making sure one's personality cannot be observed or commented is a strong urge that has precipitated many a design for these days.
3. What is DAC’s design and research methodology?
Central to DAC’s methodology is the idea of ‘environmental complicity’.

The proposition that ‘Places’ and ‘Things’ (the ‘built environment’), as well as ‘People’ cause problems.
DAC draws upon the criminological discourses of Situational Crime Prevention (SCP) and Crime Prevention Through Environmental Design (CPTED). Both understand ‘opportunities’ to be the ‘root causes’ of crime (linked to objects/environments and services as well as users and abusers).

Design out criminal opportunities and you can design out crime.

Felson & Clarke ‘Opportunity Theory’, 1998, Rutgers University, New Jersey
CPTED is a multi-disciplinary approach that relies upon the ability to influence offender decisions BEFORE criminal acts occur.

CPTED strategies aim to increase the risk and effort required to commit offences and reduce the potential reward to the offender.
CPTED strategies: **Territoriality:** Defensible space
Soft or hard, overt or covert, boundaries create symbolic and physical markers to help control territory and manage spaces.

CPTED strategies: **Surveillance: Natural / Electronic surveillance**

Offenders may be deterred if they feel they can be seen as it increases their risk of being caught. Natural surveillance occurs by designing the placement of physical features, activities and people in such a way as to maximise visibility and foster positive social interaction. Electronic surveillance is only as effective as those that monitor and respond.

CPTED strategies: **Activity support**
Popular activities are placed into the heart of empty public spaces to claim the space for legitimate users. This increases natural surveillance and the risk of detection of criminal and undesirable activities. By putting the community back into public space, a sense of ownership and guardianship over the space will emerge.
CPTED strategies: **Access control**
Control who goes in and out of spaces (physical access) to clearly define boundaries.
Placing entrances and exits, fencing, lighting and landscape, to limit access, controls the flow of people and provides a level of security without an overt security presence.
CPTED strategies: **Image & Maintenance**: Broken Windows Syndrome

A poorly maintained and managed space informs abusers that risks associated with crime are low. Bad leads to worse. If legitimate users are deterred a ‘Tipping Point’ may be reached where abusers dominate the space.
Our practice-led research process has 2 strands. Each strand has 7 stages.
4. Introducing Bikeoff Initiative
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 and environments are complicit with crime i.e. linked to misuse and abuse/theft of bicycles.
Bikeoff 2 - Catalysing anti theft bike parking and information design for 21st century living

2 year Portfolio project – 4 project strands

1. Design standards and design methodologies
2. Design resources and design education via competition & exhibition
3. Tools for consultation and user evaluation
4. Secure cycle parking infrastructure exemplars
Scoping

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

London Mayors Office aiming for 80% increase by 2012 and 200% increase by 2020.

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

Transport Research Laboratory 1997
Scoping

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

* Quick (journeys under 5 miles)
* Healthy (obesity/heart disease)
* Affordable (inclusive)
* Non-polluting (zero CO2 emissions)
Scoping

1600 premature deaths per year due to poor air quality.

Poor air quality in London attributed to the 11 million car journeys each day.

Research: Literature review

In UK, 439,000 incidents of bike theft according to BCS (just under 1 bike stolen every minute); this compares with 102,680 incidents reported to police.

In 2004-5, London, TfL estimates report 80,000 bikes stolen; of which less that 5% returned to owners.

Cycle theft is quoted as the second greatest deterrent to cycle use after road safety. Secure cycle parking is quoted as second greatest incentive after more bike lanes.
Research: Literature review

Not just a UK problem. Bike owners more likely to have their bikes stolen than car owners their car or motorcyclists their motorbike;

Bike stolen (4.7%)
Motorbike stolen (1.9%)
Car Stolen (1.2%)

Research: Behavioural research
Theft perpetrator techniques

Lifting

Levering
Research: Behavioural research
Theft perpetrator techniques

Striking

Cutting
Research: Behavioural research
Theft perpetrator techniques

Unbolting

Picking
Research: Community consultation
Bikeoff Weblog

bikeoff.org
HOW CAN YOU IMPROVE THIS BICYCLE PARKING FACILITY?

Welcome to bikeoff.org

Please tell us your recommendations for improving bicycle parking facilities, click on one of the icons below that represents the style of bike parking you use most often to share your comments.

- Fly parking
- Street parking
- Covered parking
- City schemes

Due to new site reconstruction work and other pressures, the bike parking standards consultation document will not be available until 1st November, 2006. Adam Timpson and Prof Lorraine Gamman . 1st October 2006.

Useful links:
- Bike Off Weblog
- National Cycling Strategy
- Transport for London
- Cycling Campaign

Covered Parking

Fly Parking Article (PDF)
Anti-theft design (PDF)

How bike parking image

© DAC Research Centre, December 2007, UK/Brazil Workshop on Innovation and Investment in Research and the Creative Economy
Research: Community consultation

Bikeoff Weblog

These are rubbish. The ring the lock goes through is easy to break.

I would happily place the bike in a more prominent facility, but there just never seem to be any.
Research: Community consultation
Bikeoff Weblog

These are horribly designed and most people don't even use them right. They just lean their bikes up and lock to the main part.

Signage on the racks helps, but you'd be amazed at the number of people who don't realise that all those barriers are actually bike racks.
Research: Community consultation

Bikeoff Weblog

I always try to lock my bike to a stand at the edge of the rack, a thief could sit in the middle of the racks for hours.

[Images of bicycles and a person standing next to them.]
Research: Community consultation

Bikeoff Weblog
Research: Community consultation
Bikeoff Weblog
Research: Visual Fieldwork

Using 2 locks to secure a diamond frame bike to a Sheffield stand there are 180 potential locking combinations.
Research: Visual fieldwork

We rated locking practice a good, ok or bad.
Factors contributing to the security of a parked bicycle:

* Type of lock
* Locking practice
* Parking practice (fly parking)
* Parking furniture
* Parking environment

Effective responses require an understanding of the situational factors described above and the broader context of cycle theft in the operational area (environmental complicity).
Observation:
Holborn Gateway Cycle Parking
Project Research and Observation

- Research and observation
- Analysis and brief construction
- Design and prototyping
- Implementing and testing
Observation: Qualitative
Parking practices in Holborn Gateway and surrounding area
Observation: Quantitative

8500 observations of ‘locking’ events noting situational context.
Observation: Findings: Bikes

* 75% of users have bikes of standard ‘diamond frame’ design - including top tube.

* 1/3 of cyclists we spoke to were new cyclists.

* Majority use 2nd hand bike.

* 75% of new cyclists didn’t know the name or function of their bikes components.
Observation: Findings: Locking practice

* 87% used 1 lock
* 12% used 2 locks
* 1% used 3 locks
Observation: Findings: Locking practice

Of 180 possible locking methods:

* 72% use one of 7 methods
* 53% lock only 1 wheel
* 19% lock only the frame
**Observation: Findings: Locking practice**

We found that the majority of site users locked their bikes **INSECURELY**

![Bar chart showing locking practice]

- **Sheffield Stand Before**
  - **Good**
  - **OK**
  - **Bad**

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Observation: Findings: Wider environment (CPTED Principles)

* Stands closest to the college were most popular.
* Location of objects within the site and lack of demarcation of boundaries lead pedestrians through the bike parking. This leads to user conflicts. **Territoriality**
Observation: Findings: Wider environment (CPTED Principles)

* 11 bikes reported stolen; a further 7 thefts were known but not reported; Camden police suggest 60% of thefts go unreported; more than 1 bike stolen a week on average. None of the thefts were observed, prevented or recovered by CCTV. Surveillance
Observation: Findings: Wider environment (CPTED Principles)

* The site is busy, unwelcoming and poorly lit with high pedestrian flows at peak times - becoming empty at night. **Activity support** by way of **place-making** may increase dwell time of legitimate users leading to natural surveillance and guardianship.
Observation: Findings: Wider environment (CPTED Principles)

* The site is enclosed on 3 sides by roads. Access to site is determined in relation to road traffic and road safety. Little regard is given to access requirements of other site users - particularly bikes. Access control.
Observation: Findings: Wider environment (CPTED Principles)

* Stands adjacent to abandoned bikes are least popular amongst users, even when located closest to destination served - ‘broken bike’ effect - Image & Maintenance.
Brief

We applied the research to inform briefs in the following areas:

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

ii) Cycle parking furniture: designing more secure user-friendly cycle parking furniture that promotes secure parking practice.

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

iv) Lighting and Site Improvement: the design of more user-friendly, abuser unfriendly sites for cycle parking.
i) Information environment intervention
Visualise / Critique

Information Environment:
Communicate security issues and user best practice to cyclists whilst avoiding visual clutter.
**Visualise/Critique:** Information Environment

Communicate security issues and user best practice to cyclists whilst avoiding visual clutter. Integrate signage with furniture and target messaging. Critique with Police, Street Management and Cycling groups. Whisper not shout.

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*Lock the frame and both wheels to the stand*

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**Implement**: Information Environment

* 5 sites, 1 control.

* all sites observed before intervention and locking practices recorded (4 weeks).

* stickers introduced to 4 sites.

* all sites observed after intervention and locking practices recorded (4 weeks).

* all sites observed 2 months after intervention to see if any recorded effect changed over time.
Evaluate: Information Environment

![Chart showing the information environment before and after research, observe, visualize, brief, critique, evaluate, research, observe, brief, visualize, critique, implement, evaluate, iterate, iterate, iterate, scoping.]

- Control sites
  - Bad: 0.6
  - OK: 0.3
  - Good: 0.1

- Action site
  - Bad: 0.66
  - OK: 0.33
  - Good: 0.11

**Research (Design Resources)**
- Design Practice (DAC exemplars)
  - Before
  - After
ii) Cycle parking furniture intervention
Visualise/Critique: Cycle parking furniture

Design of more secure user-friendly cycle parking furniture that improves security of cyclist locking practice.

Short stay (0-2 hrs)
Medium stay (2-6 hrs)
Visualise / Critique: Cycle parking furniture

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
Visualise/Critique: Cycle parking furniture

Working with advisory panel and industrial partner Broxap Ltd we created prototype stands.
Implement: Cycle parking furniture

* 6 new stand designs introduced on site
* 2 Sheffield stands selected as control stands
* all stands observed for 3 months
* control stands compared with new stand designs
* new stand designs will also be compared to locking practices observed in previous 8400+ observations
Evaluate: Cycle parking furniture

Design Practice (DAC exemplars)

Research (Design Resources)

<table>
<thead>
<tr>
<th>Sheffiled Before</th>
<th>Sheffield plus stickers</th>
<th>m-straight</th>
<th>P</th>
<th>Offset M</th>
<th>Normal-m</th>
<th>Pagoda</th>
<th>Chain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fraction of all locking events</td>
<td>good</td>
<td>ok</td>
<td>bad</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
iii) Surveillance and Guardianship intervention
**Visualise/Critique:** Surveillance and Guardianship

Schemes that will help cyclists look after their 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. Need to inform, empower and motivate Guardians.

**Little Brother: Bosch**

* Self surveillance
* System mgmt – registered users
* Triggers and alerts
* Response – physical/sensory?
Visualise / Critique: Little Brother

Beep!!!
Beep!!!
Beep!!!
Beep!!!
Beep!!!
Beep!!!
iv) Lighting and site improvement intervention
**Visualise: 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
* Site mgmt and maintenance – ‘broken bike effect’
* ‘Place making’ – Holborn gateway
* Other users – college users/office workers/tourists/visitors
* Way-finding
Critique: Stakeholder Consultation

Critique lighting and site improvement stakeholder consultation.
Bikeoff guidelines
Implementation: Lighting and Site Improvement

The bikeoff guidelines are implemented in 3 ways:


ii) MA Industrial Design Project - Holborn Unlocked - Unlocking the potential of cycle parking infrastructure to regenerate public space.

iii) Guidelines applied to best practice exemplars to post-rationalise efficacy of tool for design guidance.
Implementation:

ii) MA Industrial Design Project - Holborn Unlocked - Unlocking the potential of cycle parking infrastructure to regenerate public space.
Implementation:

ii) MA Industrial Design Project - Holborn Unlocked - Unlocking the potential of cycle parking infrastructure to regenerate public space.
Implementation:

ii) MA Industrial Design Project - Holborn Unlocked - Unlocking the potential of cycle parking infrastructure to regenerate public space.
Implementation:

ii) MA Industrial Design Project - Holborn Unlocked - Unlocking the potential of cycle parking infrastructure to regenerate public space.
Implementation

ii) MA Industrial Design Project - Holborn Unlocked - Unlocking the potential of cycle parking infrastructure to regenerate public space.
Implementation:

iii) Guidelines applied to Zutphen case study. Population 35,000. 1.5 hours from Amsterdam by train. Bicycle modal transport share 60%.
Implementation

iii) Zutphen Case Study: Location

Bike park is located outside Zutphen train station (within 10 meters), adjacent to bus stops, and below a public square. The bike park is accessible to cycle lanes to the left, right and centre.
Implementation

iii) Zutphen Case Study: Length of stay

The facility is open and attended 05.30 to 01.30 daily. Users can stay up to a maximum of 4 weeks.

Charges: Free of charge
Scale: 2900 cycles
(3000 capacity).
Implementation

iii) Zutphen Case Study: Access

Macro – Cycle lanes to enter the facility.
Implementation

iii) Zutphen Case Study: Access

Mezo – 2 way stair and gully. Stair to station concourse.
Implementation

iii) Zutphen Case Study: Access

Micro - Controlled: Swipe card and turnstile (no tail-gating).
Open: Overlooked by security and bike shop.
Security versus ease of use.
Implementation

iii) Zutphen Case Study: Furniture

2-tier (or ‘double-decker’). Compatible with generic Dutch bike design. Bike secured in position using the integrated lock - difficult to manoeuvre off the stands when parked.
Implementation

iii) Zutphen Case Study: Layout/Spacing

Clear sight lines. Rows separated by circulation isles 2 meters wide. Allows natural light to enter space. Positioned alternately high and low to maximise density (400mm apart).
Implementation

iii) Zutphen Case Study: Signage

Macro: Signed from cycleway illustrates guarded, covered facility.
Mezo: Opening hours and access instructions.
Micro: Numbered isles, CCTV and parking rules.
Implementation

iii) Zutphen Case Study: Lighting

Brightly and evenly lit by overhead lighting. Designed so as to maximise the amount of natural light entering the underground space.
Implementation

iii) Zutphen Case Study: Surveillance and Guardianship

Electronic: Monitored CCTV located at 2 meter intervals throughout
Natural: Staffed 20 hours a day.

Shop and parking attendants - Activity support.
Implementation

iii) Zutphen Case Study: Maintenance and servicing

Ongoing daily by on-site staff – no faulty lighting or abandoned bikes.
Implementation

iii) Zutphen Case Study: Summary

1. Zutphen design applies risk, effort and reward in relation to users and abusers.

2. Utilises CPTED principles: Territoriality, Surveillance, Image and Maintenance, Activity support, Access control to good effect.

3. Creates sense of ownership and civic pride through investment in design and permanent staffing.

4. Supports modal increase for bicycles - 3000 spaces already too few!

5. Multi-stakeholder delivery – Municipality and private rail company enables ambitious plans to be realised.
Evaluation

Bikeoff design guidelines

i) Guidelines provide structure to ensure design is ‘fit for purpose’, promoting use and deterring abuse whilst allowing for diverse application according to user need, design inspiration and context - Central Saint Martins College of Art and Design, MA Industrial Design outputs.

ii) Zutphen case study illustrates the manner in which all elements of this exemplary design are accommodated within the guidelines.

iii) When applied to Zutphen the guidelines expose their value as a critical design tool. (e.g. identify shortcomings relating to Universality of furniture, inclusive access, room for expansion).
Evaluation

Bikeoff design guidelines

Uptake of guidelines by stakeholders indicates their value:

* Informing Transport for London secure cycle parking guidance.
* Providing starting point for Secured By Design Standard for secure cycle parking.
* Contributed to Home Office Eco-homes standard.
* Contributed to Commons Transport Select Committee Inquiry into the British Government’s Rail White Paper.
* Contributed to counter terrorism design debate i.e. mediating between sustainability and security in relation to bike parking in public spaces perceived to be threatened by terrorism.
* Contributed to Home Office Design and Technology Alliance thinking in regard to identifying bikes as ‘hot products’.
Conclusion: The problems with CPTED

There are five primary barriers to the international adoption of CPTED - even though it is already informing initiatives like The Project For Publicspace in America (www.pps.org), and DOCA in Australia and Europe (www.e-doca.net).

1. Lack of education.

2. Resistance to change by significant stakeholders.

3. Costs of retrofit implementation is expensive, and politically difficult.

4. Not a panacea - should not displace other ways of reducing offender behaviour – drug rehabilitation programmes for example.

5. Insensitive implementation causes problems e.g. Defensability V Mixed Use/ Banning all graffiti – rather than banning tagging.
Conclusion:

We believe that secure design doesn’t have to look criminal - that a thing of beauty is a joy forever and that designers can design against crime to promote social capital.

Design against crime, as socially responsive design, responds to social issues in pursuit of social change.

It is design that seeks to accommodate multiple stakeholders and mediate between competing user requirements.

It is design that discriminates in response to context, that puts users first and militates against abuse.
Next steps:

1. Stickers being implemented across London

2. Stands being implemented in several London Boroughs and outside London (Brighton & Hove)

3. Guidelines being consulted upon online (wiki) to gain full consensus and differentiate for different Contexts (residential/ off street/ on street) - maybe you’d like to join in?
   www.bikeoff.org
   adam@vexed.co.uk

4. All findings being visualised for design resource.
Questions:

* Is crime detracting from achievement of social objectives in Sao Paulo?

* Are you considering crime prevention in design for public space?

* How are you responding to this issue?

* Can you show us how you are addressing it?