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### Don't give thieves an easy ride: Design against bicycle theft

See entries and final results for this brief [here](#).

This project is a collaboration between the RSA, the Home Office and the Bikeoff 2 research project funded by AHRC/EPSRC 'Design for the 21st Century' initiative. The aim is to mobilise students to explore how design-led strategies for secure cycling can reduce the risk of cycle theft, increase cycle use and afford UK cities and citizens the benefits cycling has to offer.

Riding a bike can add nine years to a life (1) – better still it can make our cities a safer, healthier, cleaner and quieter place to live in!

Bicycles are quick (for journeys under 5 miles), healthy (reducing risk of obesity and heart disease), affordable (equality of opportunity), non-polluting (zero emission) and low hazard (less harmful than motor vehicles), placing cycling in a unique position to contribute to better health, fewer absences from work, reduced congestion and pollution and to save lives (2). *There is also evidence to suggest that increased cycling would lead to mental health benefits, physical development benefits, social benefits, potential reductions in the number of accidents and even tourism opportunities* (3).

In light of these facts, in 1996 the National Cycling Strategy set a target to quadruple cycle use by 2012. In 2004 this target was dropped as it was considered unattainable. Not only is it unlikely to be met, but according to the National Cycling Strategy Review, cycling activity has actually fallen over the past 10 years (4).

Cycle theft is the single greatest deterrent to cycle use after fears over road safety; secure cycle parking is identified as the second greatest enabler after provision of safe cycle lanes (5).

Research has shown that 17% of cyclists experience cycle theft, and of these 24% stop cycling and 66% cycle less often (6). If we are to achieve and sustain increased cycle use we must address the issue of cycle theft.

The Government accepts that to get more people cycling they must act to increase cycling infrastructure, including secure cycle parking, to reduce cycle theft. They are investing £140 million over the next 3 years to facilitate cycle use. The financial resources have been made available but if the benefits of cycling are to be realized design innovation must keep pace with capital investment.

1 Journal of American Medical Association, 2003, 'Years of life lost due to obesity'

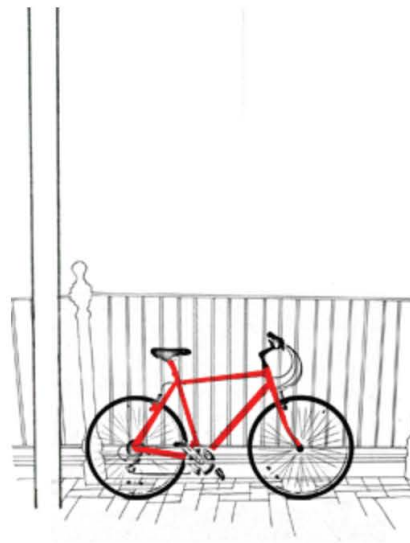
2 Valuing the benefits of cycling, A report to Cycling England, May 2007

3 Valuing the benefits of cycling, A report to Cycling England, May 2007

4 Department for Transport - Delivery of the National Cycling Strategy: A 5 review, March 2005

5 Department of the Environment transport and the Regions. 07/97:Supply and demand for cycle parking.

6 Transport Research Laboratory, 1997





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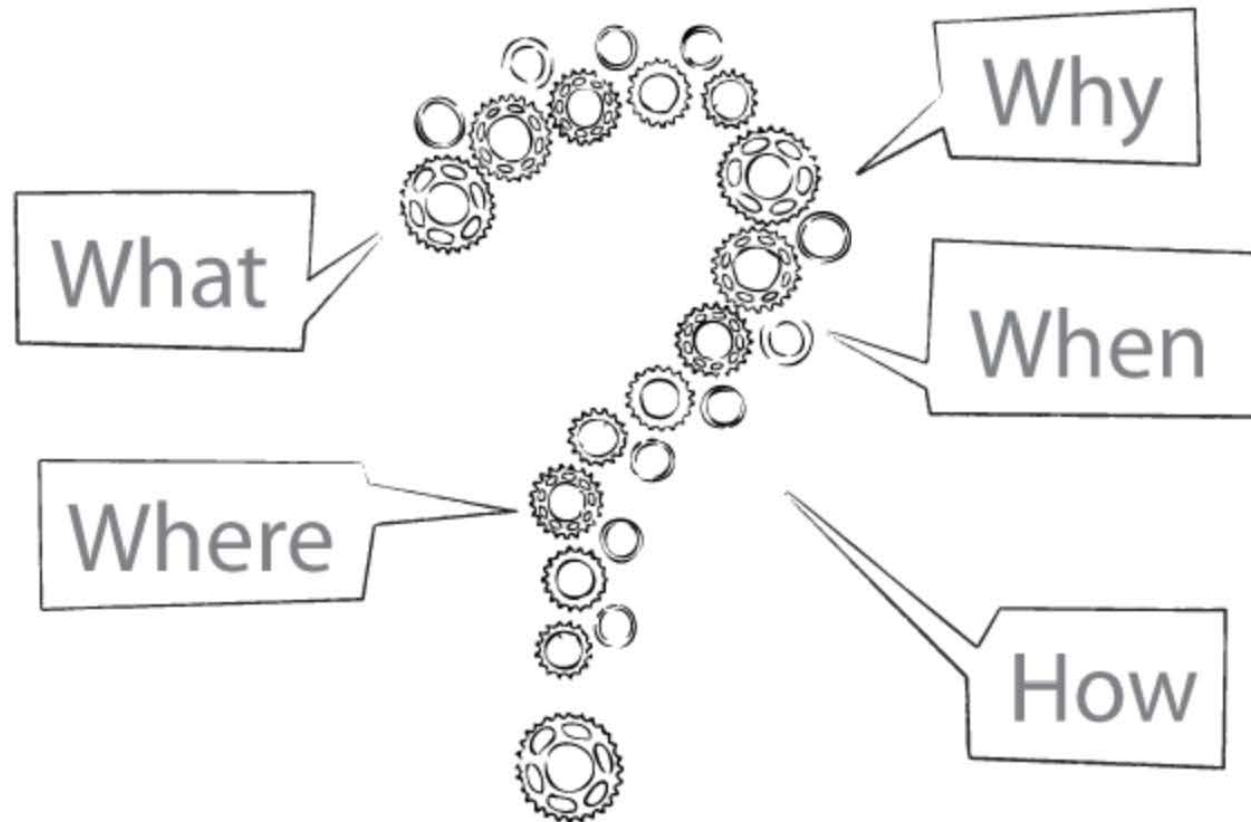
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### WHAT?

There are two kinds of bike related theft:

1. Theft from bicycles; components and accessories (typically, stolen parts and accessories can fetch 25% of RRP).
2. Theft of bicycles; theft of the whole bike - frame, components and accessories (typically, a whole bicycle can fetch 10% of RRP).



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### WHERE?

In cities such as London and Brighton & Hove the majority of bicycle thefts take place when the bike is left unattended or 'parked' in a public place; however across the UK as a whole the majority of reported bicycle thefts are from private homes, sheds or garages.

These figures may reflect the nature of cycle use and availability of 'off street' parking opportunities in these locations. City geography and traffic congestion promotes cycle use for commuting, working, shopping and mobility, and population density makes off-street parking limited.

Outside of cities, daily mobility often involves greater distances and cycling is often a leisure pursuit. Reduced population density and associated land availability means the presence of sheds and garages provide off-street cycle parking. Either way, bicycles left on the street, in a garden or shed are a target for theft. Bicycles left in a hall, corridor or lobby are a nuisance, without designed accommodation, and in shared households also a target for theft.





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### WHY?

Bicycles are 'Hot Products' and can be described by the **C R A V E D** model of theft targets:

**Concealable:** stealing a bike can look like unlocking a bike and a thief on a bike looks like anyone else on a bike

**Removable:** poorly locked means easily removable

**Available:** millions of bikes on street or in sheds up and down the UK

**Valuable:** components 25% RRP, bicycles 10% RRP

**Enjoyable:** everyone likes to cycle and 'sporty' bikes are twice as likely to be stolen

**Disposable:** lack of effective registration and high demand for bicycles makes bicycles easily disposable





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### WHEN?

Timing of theft varies according to local context but generally theft occurs when there are a lot of bikes around unattended and particularly when those bikes are unobserved, either due to no formal surveillance and too few passers by, too many passers by (crowd cover), low lighting levels or obscured sight lines.



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### HOW?

Bikeoff research has identified six common theft perpetrator techniques. These are illustrated and described in detail in the online design resource that supports this project but can be summarized as:

Cutting through the lock or the object its locked to, picking the lock, levering the lock apart, lifting the bike and lock over the object its locked to, striking the lock to break it apart and unbolting the components to remove all the parts of the bike not secured by the lock.



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Statistically a bicycle is stolen every minute in the UK with less than 5% returned to their owners (1).

Bike owners are more likely to have their bike stolen than motorcyclists their motorbike, or car owners their car, indicating that cycle theft is easier or less risky than theft of other vehicles (2).

The challenge is to change this situation: How can cycle security be improved, *without* compromising the ease and enjoyment of cycling? The aim is to design functional, attractive and secure cycles, anti-theft cycle accessories (locks), secure cycle parking (furniture and facilities) and anti-theft cycle schemes (e.g. registration schemes) to promote cycling.

When designing new products designers take on board, consciously or unconsciously, factors and issues which influence their decision-making process. These may be classified according to 'models,' through which we can gain a greater understanding of the design process, and the agendas behind it. This project is concerned with an analysis of and response to a *system of use*.

When considering a *system of use*, it is often beneficial to consider alongside this, a system of *misuse and abuse*. Taking a 'sideways' look at products from the point-of-view of a non-typical or undesirable user such as an adaptive criminal, gives great insight into ways of tackling crime through design.

Designers rarely take on board issues of crime prevention in the design of new products. Vulnerability of a product to crime, or to the criminal use to which a product might be put, are most often problems noticed in hindsight with a view to some sort of post-design fix. This is far from ideal.

A key skill that designers have is to make sense of the way people live and behave, and draw insights from those observations. This allows them to visualise radical ideas and solutions. In the same way they need to be able to anticipate and visualise the benefits and problems with particular systems – in this context, bike security, personal security, anti-social behaviour, access, property theft, vandalism – and what the appropriate design interventions might be to improve them.

Recent years have seen a number of initiatives and organisations that address crime issues from an environmental and situational point of view, including Secured by Design (SBD), Designing out Crime Association (DOCA), Crime Prevention Through Environmental Design (CPTED), [COPS guides](#).

A more reflective, culturally aware and predominantly object-based approach may be seen in work created by the 'Design Against Crime' (DAC) Research Centre at Central Saint Martins. The research of the Bike Off Research Initiative was set up in January 2004 to establish how the design of cycling related objects and environments, as well as communicating best secure practice to cyclists and providers of cycle infrastructure, may reduce the risk of bike theft.

This Design Directions project requires you to draw on the findings of the above research, now summarised in the [Bikeoff 2 design resource](#) as well as your own innovative research around cycle use and security.

1 In UK, 439,000 incidents of bike theft according to BCS 2004-5 (just under 1 bike stolen every minute); this compares with 102,680 incidents reported to police.

2 International Crime Victim Survey, 2000





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## Understanding Context

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The context of cycle use and cycle parking affects the circumstances of theft and so a clear understanding of context of use (and theft) is essential to any design-led anti-theft strategy.

Understanding the context of any parking event, and any theft of a 'parked' bike, requires the designer to consider:



It also requires consideration of how the people experiencing the parking event described above may behave and, as has already been stated, the designer's skill of drawing meaning and insight from these observations is an important part of what they offer. Whilst user-focused design practice is becoming more mainstream, there needs also to be an understanding of the context of use, requiring consideration of multiple 'users' and an understanding that not all 'users' react in the same ways to products and services, nor in the ways envisaged.

The term 'users' doesn't accurately describe the relationship between the design and those whose experiences and actions need to be considered so the term 'actors' is used to describe those individuals whose 'actions' impact on the context.

'Actors' may have a positive relationship with the parking event (cyclist, security guard) or a negative relationship with the parking event (bike thief, obstructed pedestrian). Consideration of these actors and the behaviour that the designer wants to both encourage and prevent from them is central to designing an appropriate strategy that will deter abuse or theft.

It is useful to consider each actor's behaviour in relation to your proposed design from the perspective of 'risk', 'effort' and 'reward'. A successful solution is likely to be one that *reduces* risk (of theft) and effort (of use) and *increases* reward (enjoyment, aesthetics, convenience) for positive actors (a cyclist or passer by) whilst *increasing* risk (of getting caught) and effort (of stealing) and *reducing* reward (of theft) for negative actors (a bike thief).

When there are conflicts between desired outcomes (for example "my solution is really secure but takes slightly longer to use") then it is up to you as the designer to mediate these conflicts and justify your reasoning for the way in which you do so.

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You are asked to consider how design of cycling related products, infrastructure, schemes and services might contribute to reduced risk of cycle theft without compromising the ease and enjoyment of cycling and indeed make people want to cycle more!

You should address the needs of cyclists but also consider the roles, requirements and responses of other 'actors' relevant to your proposals. You could design a bike, a lock, a piece of cycle parking furniture, a parking environment, a combination of the above or some other innovative method of achieving the desired objective. Your solution may be 'stand alone' or somehow integrated into a larger system or strategy. Whilst you may submit developed proposals for one or more 'items' above, you should do so within the context of a broader system for use and explain this context within your submission.

You will be provided with design resources to help you highlight the important issues.

You are asked to explore the topic from your own perspective and to address a specific context of your choice. So what do the people you observe currently do with their bikes? How, with a little creative insight, could you create something that would make their lives better, easier, more efficient, more enjoyable? Innovation often comes from the edge rather than the obvious routes and this is what your observations and action research should uncover.



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## Things To Think About

It is essential that you consider the following:

- Who is the person (people) that I am designing for?
- Why do they use their bike? (Reduced travel costs, green issues, health or lifestyle issues)
- How often do they use their bike? (Daily, weekly, weekend only)
- What type of bike do they ride?
- What are their needs and priorities?
- What are the behaviours that you want to promote and prevent?
- What is the environment in which they will experience/engage with your design?
- What solutions already exist in your chosen design area or related design areas and what is good and bad about them?
- How does your proposal relate to the aims and objectives of other cycling stakeholders?

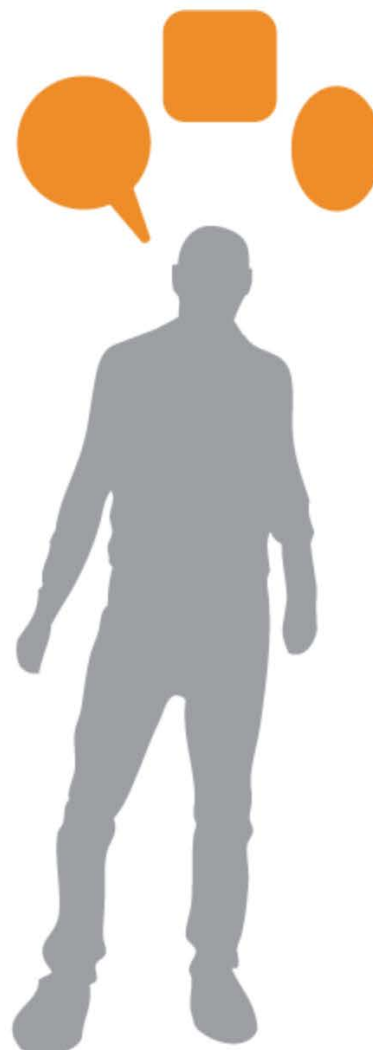
Work out your design priorities by talking to those you are designing for and also, perhaps, those that you are designing to foil. For example different users may demonstrate different sensitivities and responses to risk and convenience – how would you accommodate such differences or is it unnecessary to do so?

What is the intervention? How does it relate to existing patterns of use, and/or design provision - clearly communicate what it does, for whom, and why.

How does the intervention work? Is it easy and enjoyable to use? Does it reduce reward for the thief, increase effort or risk of detection and arrest? How does it thwart the offender whilst facilitating legitimate use? Might thieves develop countermoves (for example some kind of tool to defeat the improved security?) Can your design guard against this?

How is your design to be experienced? What will be its impact, both direct and indirect, on the actors you consider? What will it be made from? Who will make it? Consider cost implications – could your design be implemented?

Your proposal should clearly explain how you explored the issues and how this influenced your design proposal.



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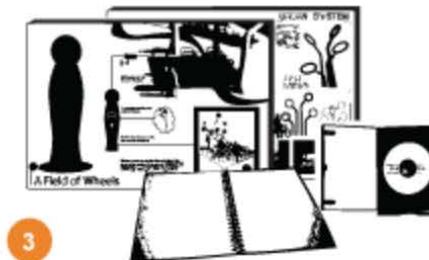
The delivery must be a written outline together with a visualisation of your device/product, environment, service, system idea that addresses the issue. This must include the communication, through any medium you see relevant, of the following:



1

[Statement](#)

2

[Evidence of Research](#)

3

[Realisation](#)

4

[More Information](#)

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The delivery must be a written outline together with a visualisation of your device/product, environment, service, system idea that addresses the issue. This must include the communication, through any medium you see relevant, of the following:

### 1. A statement of creative strategy

This is your big idea. It is essential and should be done whether you are proposing a device, product, a service or environment. It should be no more than 500 words.



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The delivery must be a written outline together with a visualisation of your device/product, environment, service, system idea that addresses the issue. This must include the communication, through any medium you see relevant, of the following:

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### 2. Evidence of Research

Include information about whom you consulted and how this led to your strategy and proposal – this can be in sketchbook / report form and be a mix of visuals and words.



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The delivery must be a written outline together with a visualisation of your device/product, environment, service, system idea that addresses the issue. This must include the communication, through any medium you see relevant, of the following:

#### 3. Realisation

This is how your proposal tackles the issue and can be presented in the form most appropriate to your chosen solution. For example the options might be:

- A3 boards (max. 4) showing design development and final designs; if you submit a product solution, one board must show all elevations of it to provide an understanding of the assembly.
- a written outline together with a visualisation of your service idea submission on CD (PC or MAC) or DVD. Please list clear details for loading and any other information that will enable the content to be easily viewed; please test your discs prior to submission and check that they are virus-free. Any discs that cannot be opened will not be judged. Director and Flash applications should be saved as Projectors for the relevant platform (PC or MAC) and clearly labelled as such.
- any models or mock-ups should be submitted as photographs or printouts mounted on A3 board (this can be in addition to the 4 design boards). **Do not submit 3D work** at this stage.



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The delivery must be a written outline together with a visualisation of your device/product, environment, service, system idea that addresses the issue. This must include the communication, through any medium you see relevant, of the following:

#### 4. More Information

- Students short-listed for interviews will be asked to prepare a 5 minute presentation outlining their proposal.
- All work (except the sketchbook) should be submitted on A3 lightweight card and everything should carry the RSA label on the back.
- Do not submit work in plastic sleeves or on foam board, metal, wood, Perspex, or in boxes; these requirements are in the interests of students to ensure the safety of their work whilst in storage and transit, and to ensure that it can be displayed for judging.
- Award value: £2500



## Methodology

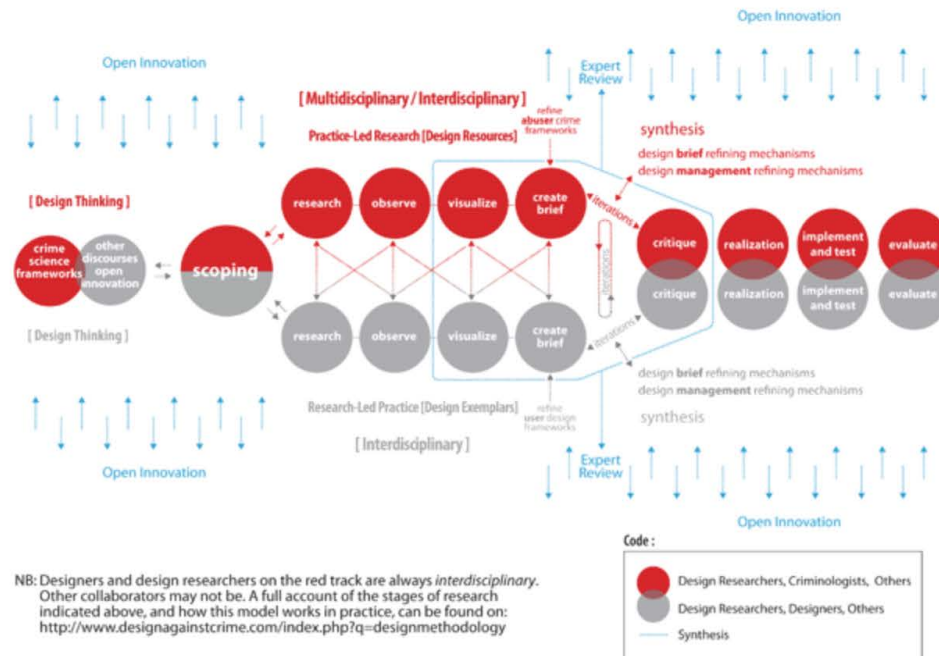
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### Design Against Crime

#### Evolved Twin Track Model of the Iterative Design Process

[ Gamman & Thorpe 2007, revised 2009 for Bikeoff ]



Bicycle crime is a complex challenge to understand and successfully address.

This Design Resource is focusing on "the problem" (green section) and "design responses" (red section) has tried to make it easier to comprehend the issues quickly.

The Bikeoff Design Resource summarises key facts and debates about crime and crime prevention and locates design responses that are already out there, to help designers and providers understand what has already been delivered, what works and what doesn't (how and why) enabling them to get smart quick about what to consider when creating new designs against bicycle crime.

To respond to the RSA competition, users can draw on the material in the green and red sections. To help make your thinking about crime more rigorous, and to work out practice through user/abuser centred design visualisation and prototyping, we have created two further tools you might find helpful. They can be accessed via our design against crime website as follows:

[Model of design and design research and prototyping process by Lorraine Gamman and Adam Thorpe](#)

Key Readings include:

Lorraine Gamman and Adam Thorpe. *Less Is More: What Design Against Crime Can Contribute to Sustainability*. Presented at Changing The Change, Turin, Italy, July 2008.

[Crime frameworks for disciplined design thinking](#) by Paul Ekblom.

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## Crime Frameworks

**Thinking Thief: Crime Frameworks for Design Against Crime** sets out some of Paul Ekblom's **crime frameworks**. A slide version is [here](#).

**Part A** presents the frameworks intended to give designers the underpinning knowledge of design against crime, taken from a crime science source but much adapted by collaborations with designers. The knowledge covers defining the crime problem and the characteristics of the aspired-to solution; and filling the gap between problem and solution by using a range of successively more sophisticated practical conceptual frameworks. These include:

1. The Crime Situation & its individual elements
2. The situation as a complex whole – the Conjunction of Criminal Opportunity
3. The dynamics of interaction between the people, the products and the places involved in the CCO – Scripts, script clashes and Stories
4. The more specific characterisation of types of crime risk – the Misdeeds & Security framework
5. Mobilisation of people/organisations (including users, site managers, designers and design decisionmakers) as crime preventers – the CLAIMED framework

**Part B** moves from the general to the particular, and runs through a possible sequence whereby the frameworks just introduced can be used in real design problems. The example used throughout is bike parking; in many cases design for indoor bike parking, which originated in briefing for a MA Industrial Design studio project at CSM.

A companion presentation '[Risk analysis design guide](#)' introduces a more structured version of the frameworks described here (the aim in due course is to merge them completely), and uses them to undertake a specific crime risk analysis of bike stands and bike parking facilities, leading to a theory-based suite of security design guidelines. It will also use the same framework (by summer 2009) and language to articulate guidelines obtained from a review of design material 'out there' and to synthesise a single guidance document.

This suite of interdisciplinary frameworks and procedures is ultimately intended to be developed into a practical working package for the developers of design guidance and design standards; and at another level for designers and crime scientists working together in practice and research. As such it is part of the contribution of the Design Against Crime Research Centre towards developing and building innovative capacity in the struggle against crime.

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## Brief 1 Results

Don't give thieves an easy ride:  
Design against bicycle theft

### Jury Members

Chair: Adrian Shaughnessy  
Rose Ades, Head of Cycle Centre of Excellence,  
Transport for London  
Reg Bradbury, Deputy Chairman, Broxap  
Catherine Ince, Design Curator and Project Manager, Art,  
Architecture and Design, The British Council  
Adam Thorpe, Reader, Socially Responsive Design,  
School of Graphic and Industrial Design; Associate  
Director, Design Against Crime Research Centre,  
Director, Bikeoff (DAC), Central Saint Martins College of  
Art and Design, University of the Arts London  
Tom Lloyd, Pearson Lloyd

The categories were: Locks, Furniture, Accessories and  
Schemes

All results from Design Directions 08/09 can be found  
online [here](#).



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### WINNERS

#### Grant Howarth (Furniture)

New Graduate  
Design Against Crime Research Centre Award of £625



#### Tom Pandé (Locks)

New Graduate  
Design Against Crime Research Centre Award of £625



#### James Peacock (Locks)

The University of Nottingham  
Design Against Crime Research Centre Award of £625



#### Nicholas Sharp (Schemes)

Northumbria University  
Design Against Crime Research Centre Award of £625



### COMMENDED

Vincenzo Di Maria, Pu Tai, Bruno Taylor  
New Graduates



Helen Morris  
Loughborough University

### SHORTLISTED

Nathaniel Hunt  
The University of Nottingham

Po Kin Lee  
Birmingham City University

Sophie O'Hare  
National College of Art and Design Dublin

### OTHERS / LOCKS

Barry Watson, Gavin Brown, Caitlin Thompson



Jack Cheatle



Tom, Matt, Dan and...



William Hall



### OTHERS / FURNITURE

Ali, Selim and Suren



Andrew Danher



David Bracey



James Vale



Jonas Brand



Nils Akenes, Jamie Nickleson, G Petherick Kerr



Ross Cameron



Ruaric O'Boyle



### OTHERS / SCHEMES

Alex White



Jack Seal



Lisa Chauhan



Nicolas Robinson and Michael Floch



Simon Chin

