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DAC and Business Crime

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MA Innovation Management Course, CSM 2009

Design Against Crime Research Centre

Arts & Humanities
Research Council

The Grippa research programme, mainly funded by AHRC, is a collaboration between the Design Against Crime Research Centre, Central Saint Martins College of Art & Design, University of the Arts London, and the UCL Jill Dando Institute of Security and Crime Science. Papers and other materials from the programme are at www.grippaclip.com and wider practical and research material on preventing bag theft at www.inthebag.org.uk

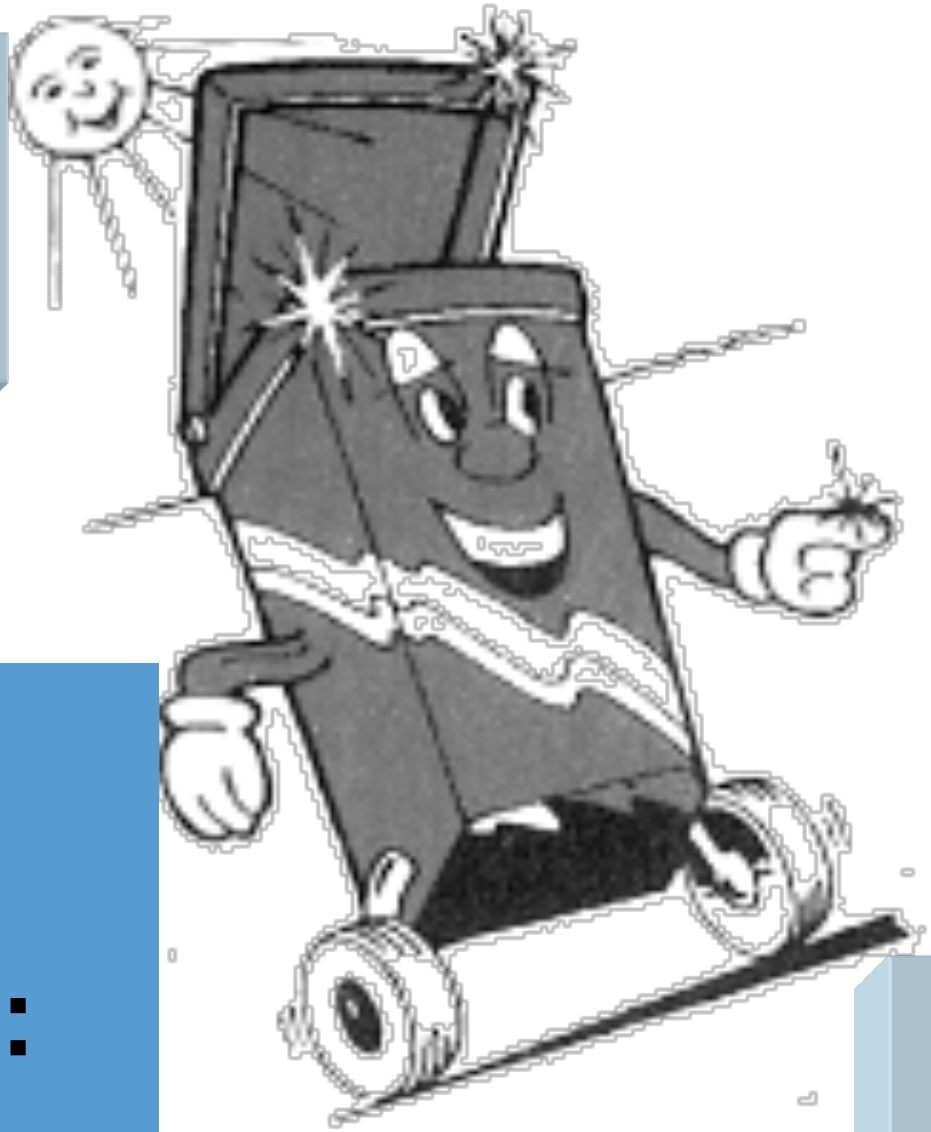
Most design follows a user-centred approach

But people abuse the designs!

So to the user we add the abuser

Few designers have the right mindset for this

A receptacle for grime?



Or a tool for crime?

Wrong mindset for design: failure to think thief

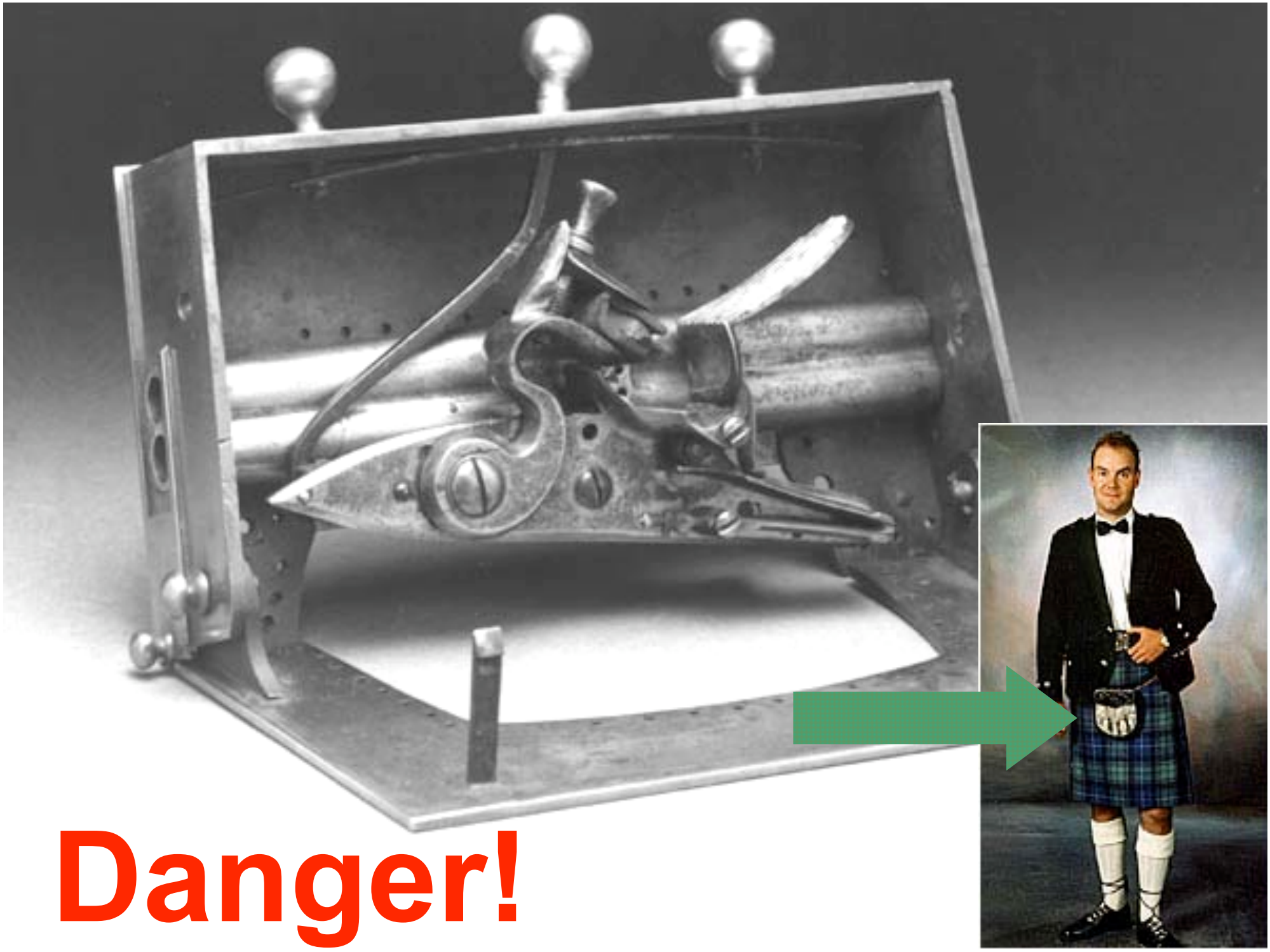
Response: The No ClimBIN
Jenny Loqvist
Griffith University Australia 2008

Competition organisers

Design Out Crime Research Group
Curtin University Australia
www.designoutcrime.org

We've developed a dirty mind abou crime…

But we don't go over the top with paranoid products


Danger!

Hence the slogan

User-friendly /*Ab*user *un*friendly

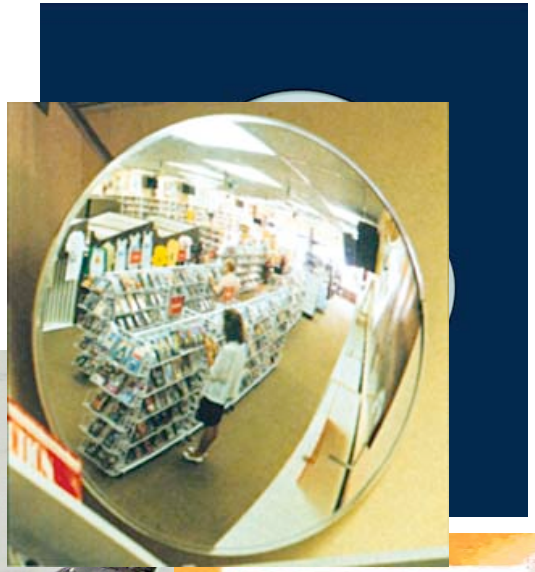
The challenge of DAC: toasters don’t fight back

The challenge of DAC: **Troublesome Tradeoffs**

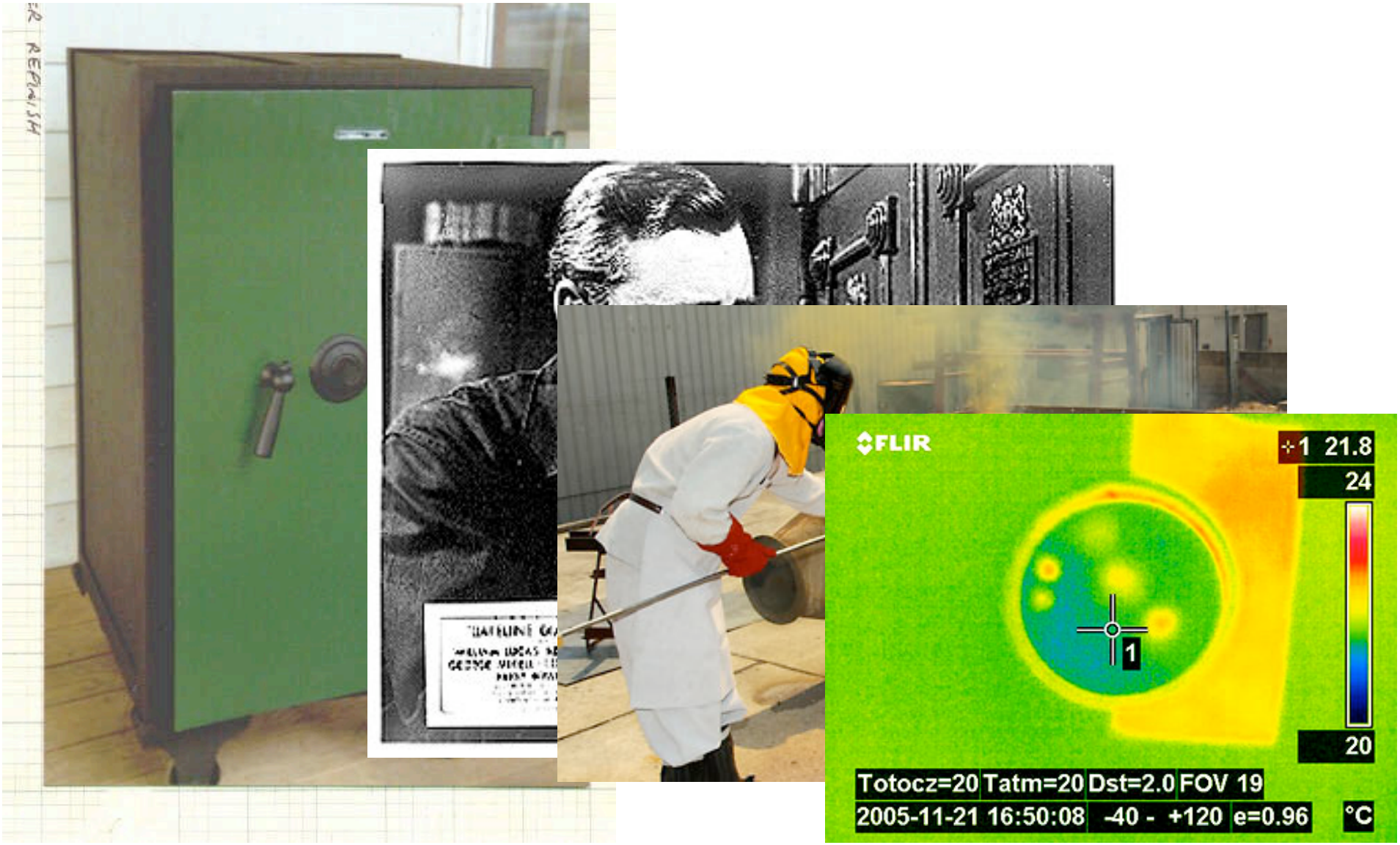
- **Security is rarely main purpose**
- Can we design secure products *without* jeopardising their main purpose and *without* their being
  - Inconvenient?
  - User-unfriendly?
  - Ugly? Effective but hideous & clunky engineering solutions
  - A threat to privacy?
  - Environmentally unfriendly?
  - Unsafe?
  - Too expensive?

The challenge of DAC –
Offenders *do* fight back – nothing stands still

- Tactical countermoves
  - in situ
  - return better tooled
- Counter-exploitation
- Strategic counter-design
- Reverse



Arms Race –
Safes and Safecrackers



Meeting the challenge

- We have to innovate faster than offenders
- This requires mobilising designers
- And mobilising businesses that employ them and make the design decisions

Mobilising designers, design decisionmakers & businesses – the CLAIMED framework

- **C**larify crime prevention responsibilities/ roles/ tasks to achieve
  - Intervention
  - Enablers/constraints
- **L**ocate appropriate preventive agents
- **A**lert them
- **I**nform them
- **M**otivate them
- **E**mpower them - increase capacity
- **D**irect them - objectives, standards

Criminogenic products – Who is responsible? Are designers and businesses complicit in crime?

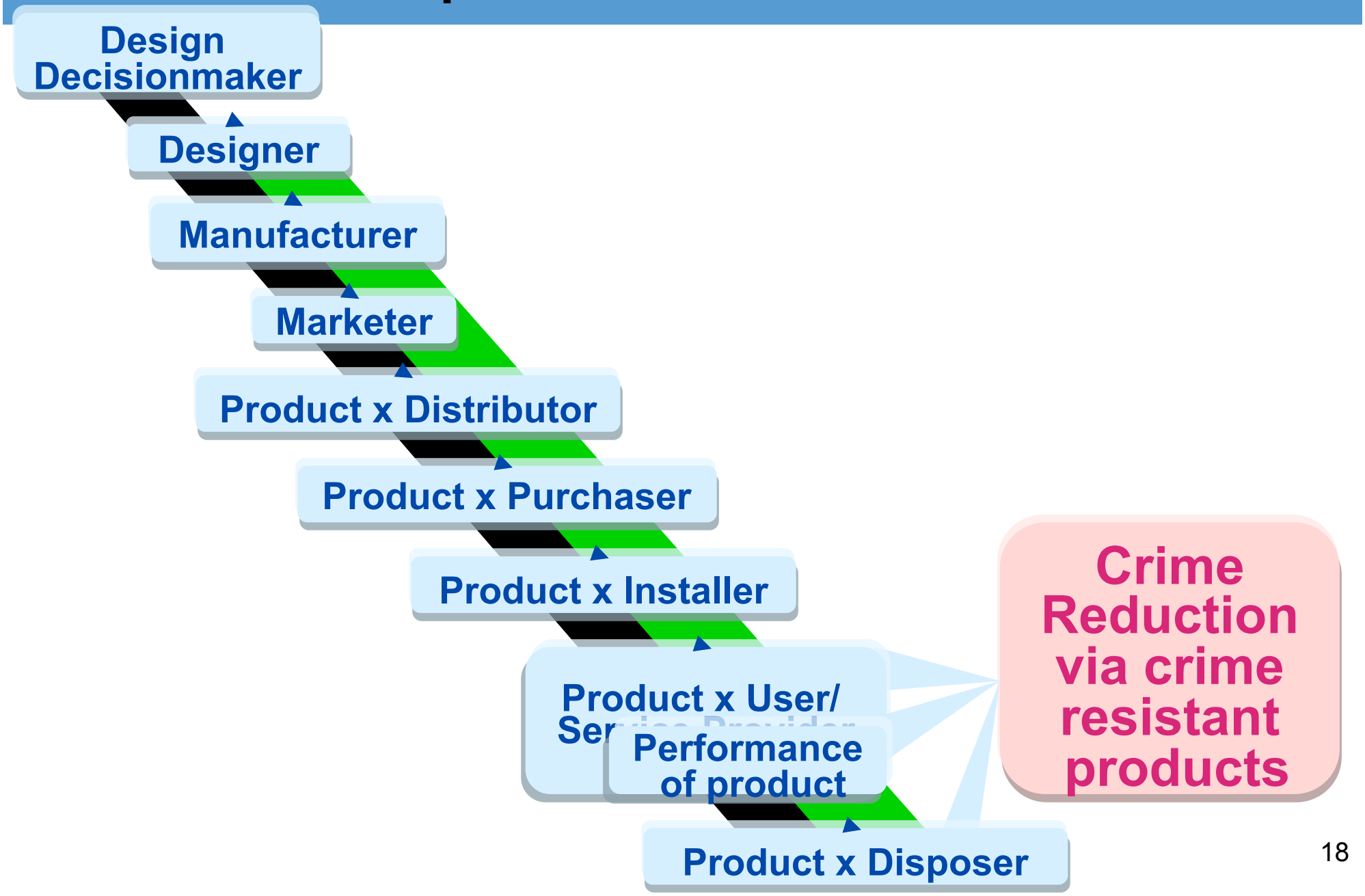
- Sales – ‘Rip us off legally’ – HMV shop, 1980s – music stored on the shelves sells faster but generates theft
- Loss/ replacement benefits industry…and owner too
- Designed-in obsolescence
- Fashion – *must* get new model, new style
- Leading architect: ‘crime is not the fault of the design, but of the people that use it’
- Crime is a hidden cost or tax – should polluter pay?

Clarify responsibility

- Businesses can act as **victims** & **offenders**
- Businesses can act as crime **promoters**
  - Inattention to own corporate security and that of staff and customers
  - Inattention to internal staff offending (against company, customers, others)
  - Inadequate risk assessment and management practice
  - Innocent, reckless or deliberate exporting of crime risk onto
    - Purchasers of products/services (insecure iPod)
    - Third parties (users of insecure bike stands, owners of cash machines attacked with cordless drills or cars where products misused to break in…)
    - Society as a whole (cost of policing, punishment, litter clearance etc)
    - Potential offenders (young people tempted into crime)

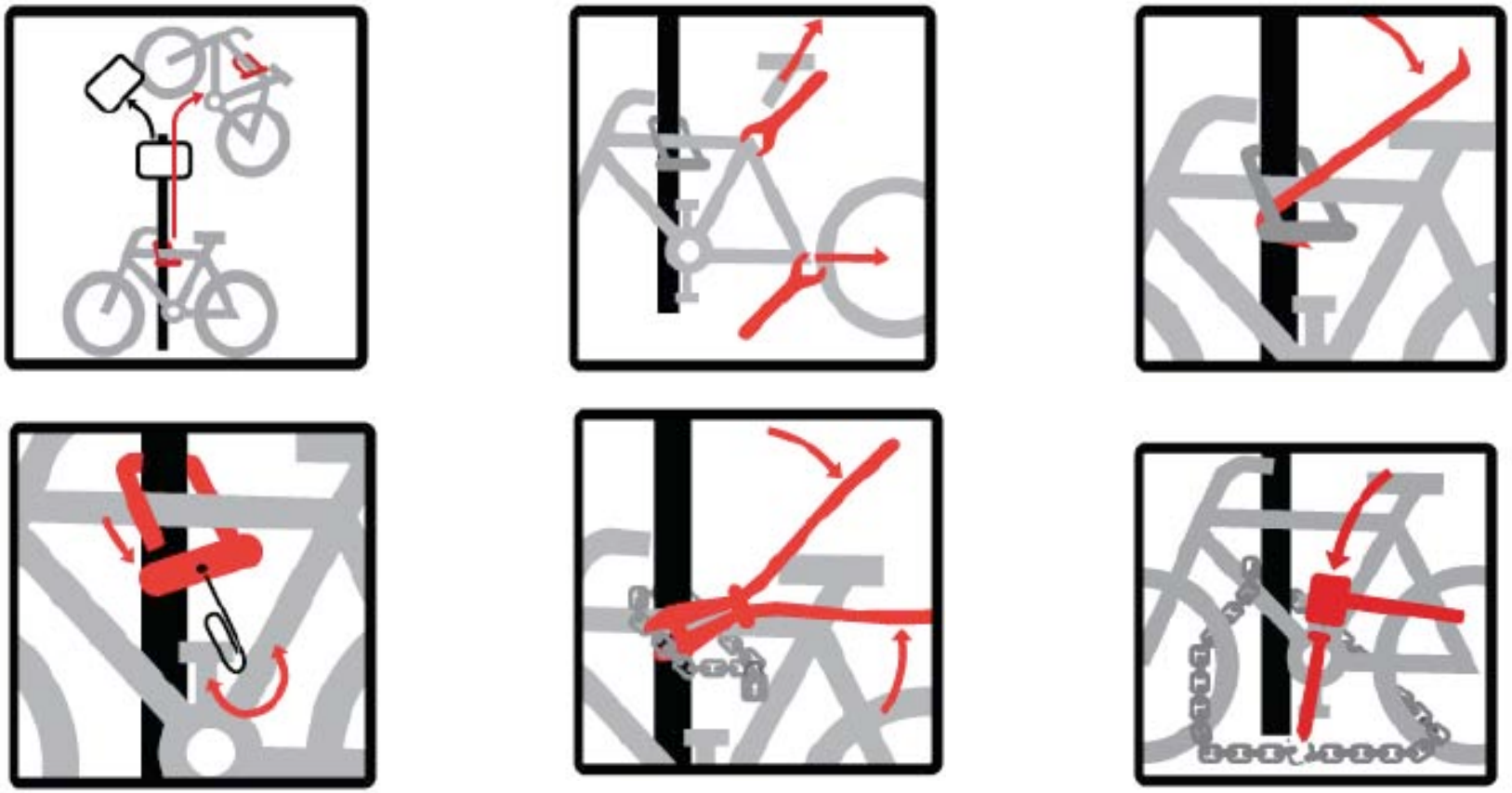
- Aim is to convert businesses to crime **preventers** – changing their behaviour beyond a nod to CSR
- Designers can help

Preventing Crime by Design – Locate who can undertake crime prevention tasks and roles



Alert and Inform businesses about crime risks and what they can do about them

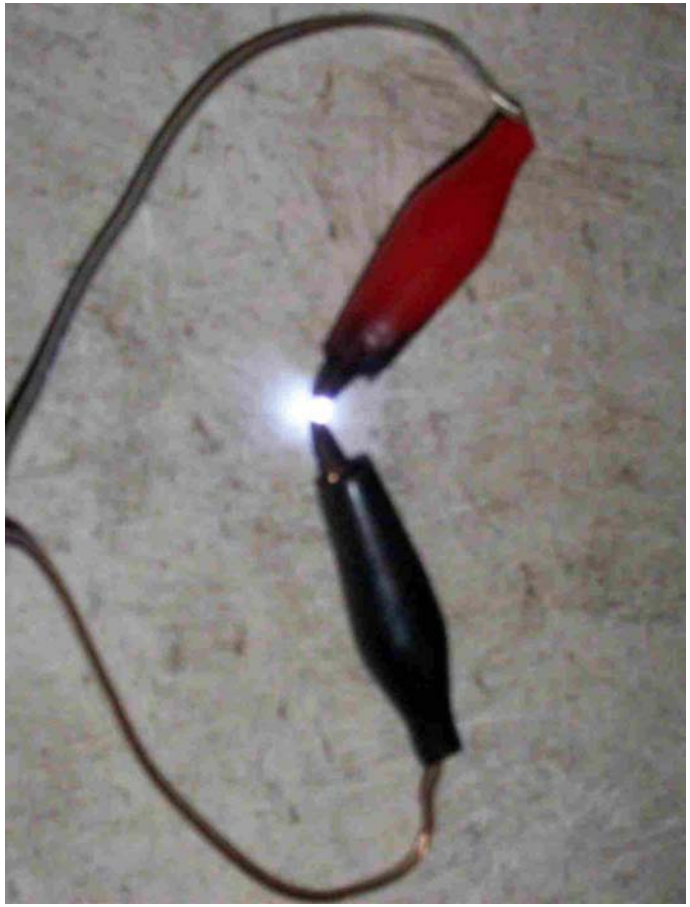
Alert and inform by research – eg perpetrator techniques



Alert and inform – by real example

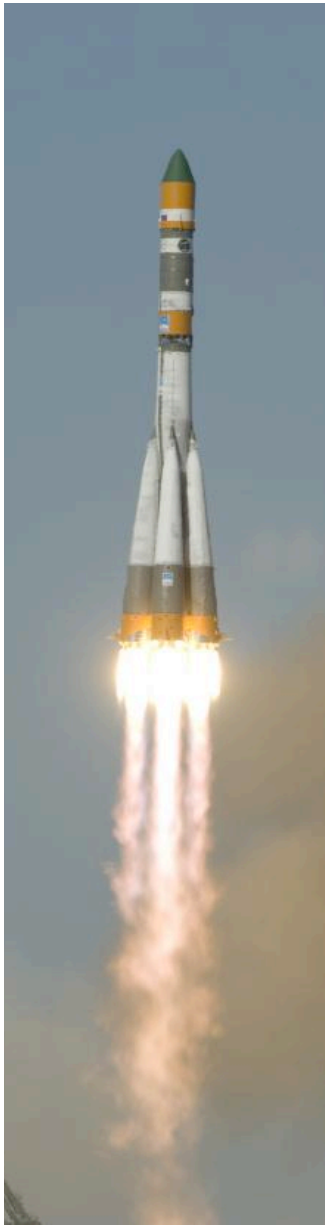
Motivate businesses to adopt crime preventer responsibility/role & undertake preventive tasks

- Appeal to business self interest or if necessary…force it on them
  - Incentives – eg tax relief
  - Regulation/fines
  - Liability – lawsuits from victims
  - Naming & shaming – reputation
  - CSR benefit
  - USP
  - Consumer pressure
  - Insurer pressure
- Obviously, **positive** motivations linked to profit and positive company image are better than **negative**



Empower businesses to be preventers

- Give businesses tools to analyse risks, make risk management decisions and implement them
- Designers can help make user-friendly tools and implement design solutions to security problems
- But designers need the tools for their own use too



Crime frameworks – precision tools for designers and businesses

- Defining risk
- Analysing risk
- Guiding interventions
- Inventiveness

What is crime risk?

Possibility – nature of criminal event

Who does what illegal act to whom/what?

Probability of event

How likely is it to happen?

Crime risk has 3 aspects

Harm from event

What is the harm?

When does it happen – immediate or knock-on?

To whom and/or to what?

Design Against Crime seeks to

Eliminate possibility of crime

or if not

Reduce probability of criminal events

or if not

Reduce or mitigate harm when they do happen - including propagation of crime

Harm information used for

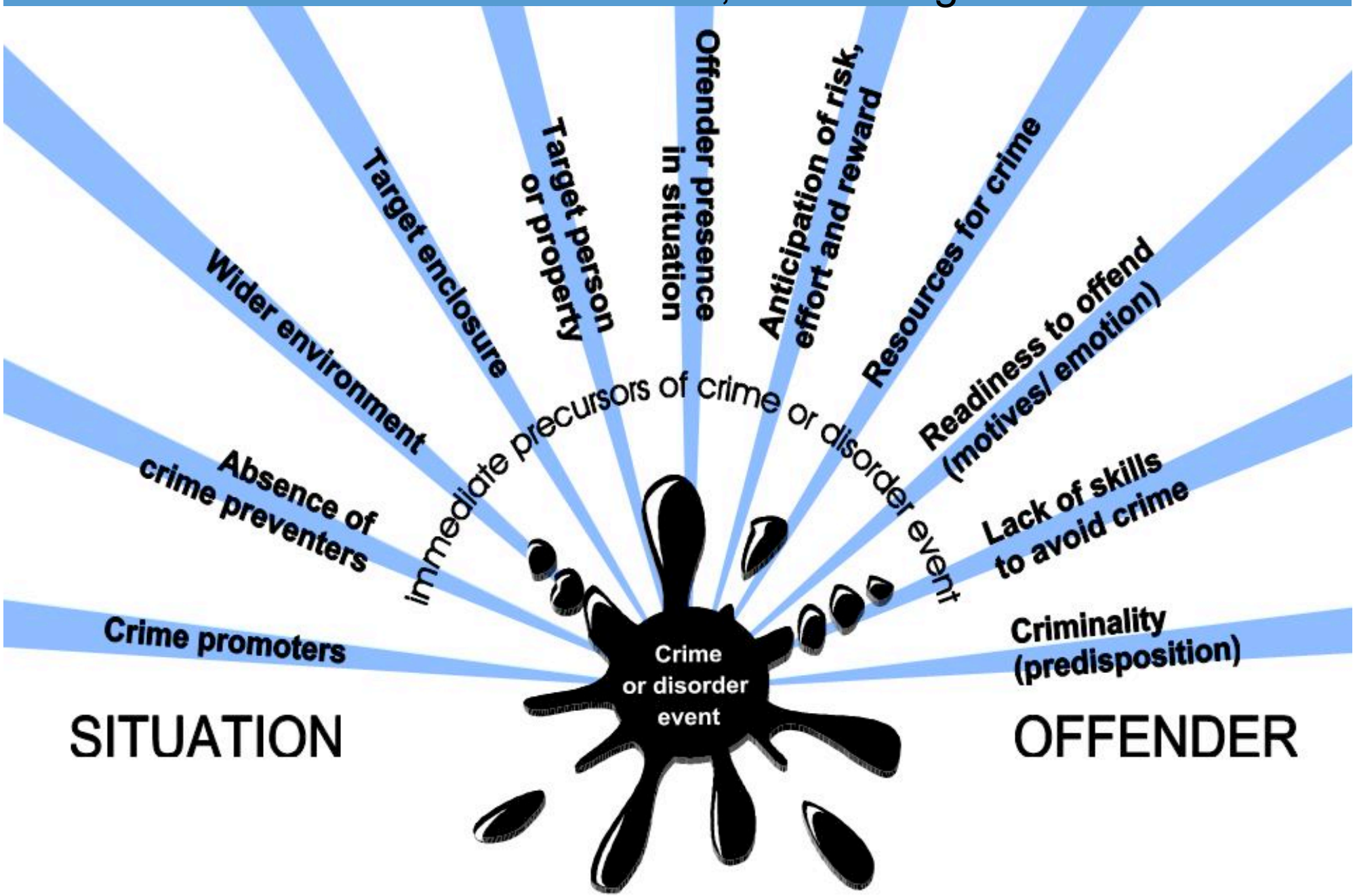
Setting **priority** in design requirements

Guiding **avoidance** or **mitigation** by design

How can DAC be helped to do this?

Analysing crime risk

The Conjunction of Criminal Opportunity (CCO): immediate causes of criminal events, influencing their risk



Identifying **Possibility** using CCO

Designed product or place might act as:

Target of crime:
Increased crime risks ***to*** object

Contributor to crime:
Increased crime risks ***from*** object

Resource for **committing** crime

Enclosure which: protects target; acts as immediate environment where crime happens; becomes target itself (eg of damage)

Wider **environment** for crime

Resource for ***preventers*** of crime – intended **security function**

Which specific crime risks do these objects or systems face?

- CCO is very generalised – to identify risks we need to look at different crime types
- But there are **hundreds** of legal categories of crime – how to tame the variety?
- **Misdeeds & Security Theory**
- This takes the generalities of CCO and focuses them on specific kinds of crime risk and preventive intervention

Misdeeds & Security – **Types of criminal behaviour**

Mistreatment (damage)

Misappropriation (theft)

Mishandling (eg fraud)

Misuse (eg as tool)

Misbehaviour (nuisance, conflict)

Mistake (false alarm)

Crime risks *to* designed object – furniture – bike stand

Designed object – bike stand/s

Increased crime risks ***to*** object – as **target**

- Mistreatment
  - Wrecking
  - Defacement by ink, paint or sticker
  - Defacement by scratching/ abrasion
- Misappropriation
  - Stolen for resale/scrap
- Mishandling
  - Counterfeit for sale
- Mistake
  - False alarm from any security sensors fitted
  - Accidental damage mistaken for tampering

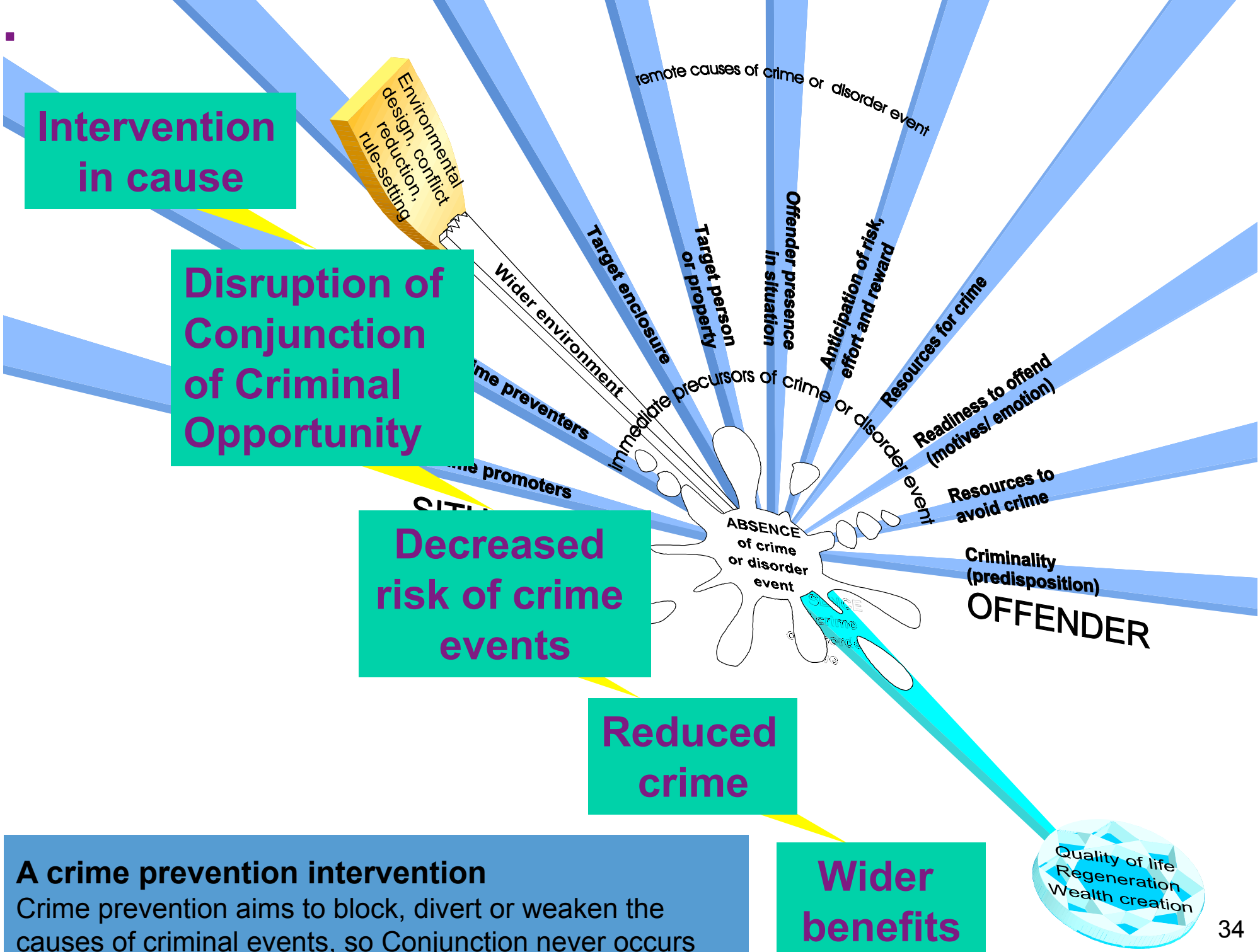
From Risk…. **to** Design

Analysis of **crime risks**

- **causes** and **risk factors**

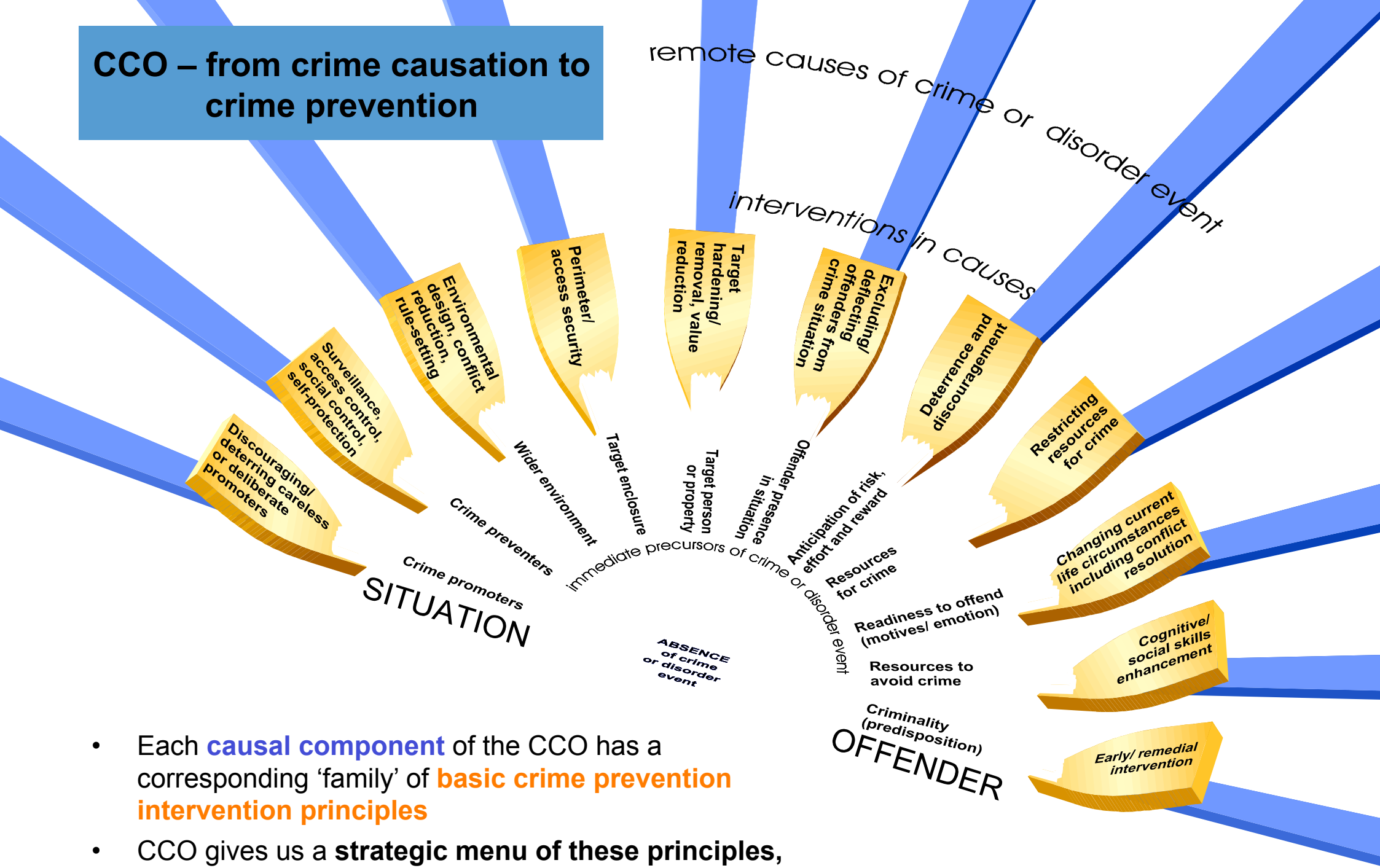
Guidance for **design response**

- reducing **possibility, probability, harm**)
- **functional** rather than technical for greater design freedom



A crime prevention intervention
Crime prevention aims to block, divert or weaken the causes of criminal events, so Conjunction never occurs

CCO – from crime causation to crime prevention



- Each **causal component** of the CCO has a corresponding 'family' of **basic crime prevention intervention principles**
- CCO gives us a **strategic menu of these principles, to enable designers to make appropriate choices** in the manipulation of the agents and entities described

Misdeeds **& Security – Functional interventions**

Mistreatment (damage)	Safeguarded v damage
Misappropriation (theft)	Secured against theft
Mishandling (eg fraud)	Scamproofed
Misuse (eg as tool)	Shielded against misuse
Misbehaviour (nuisance, conflict)	Sivilised
Mistake (false alarm)	Slip-proofed

Design guidance – stand as object - P

Mistreatment – deliberate damage as end in itself

Wrecking

Design requirements to reduce <u>probability</u> of undesired events

- **Furniture should not stimulate deliberate damage (eg by appearing weak, provocative or being rewarding to damage eg in terms of enjoyment of exercise of force, sight, shape or sound).**
- **Any mechanism should cause minimum frustration to legitimate users, hence minimise 'machine rage' – both in operation and in failure mode (eg should clearly indicate 'out of order').**
- **Furniture and its components eg locking arms should resist deliberate damage, including by use of readily available hand tools or adventitious implements (eg stones, poles, sticks) including insertion of tools or substances into working parts. *Risk factors:* proximity to supplies of adventitious implements or bracing/leverage points.**
- **Clusters should not give leverage/bracing sites to attack adjacent stands.**
- **Consider all users of the space so non-cyclists don't get hostile to furniture.**
- **Furniture should activate surveillance by calling attention to damage in progress (eg by requirement for conspicuous movement to achieve damage; inherent mechanical noise, or electronic alarm if appropriate).**

Design guidance – stand as object H

Mistreatment – deliberate damage as end in itself

Wrecking

Design requirements to reduce harm from undesired events

- **Furniture should 'fail safe' (eg not leave harmful sharp edges, trip hazards or electrical hazards). *Risk factor*: vulnerable street users eg blind, children.**
- **It should not destroy ground anchorage in breaking.**
- **Damage should not propagate – eg rusting. *Risk factor:* exposed sites.**
- **Damage to any parked bikes should be minimised.**
- **Functional damage should be tamper-evident (so user doesn't try to park at stand eg which no longer locks properly).**
- **Visual impact on environmental quality should be minimised. *Risk factor:* if in environmentally important/salient site; or where local people fearful of crime.**
- **Visual prompting of commission of further damage should be minimised (eg contrasting undercoat exposed by scratching).**
- **Effort and cost to clean/repair/replace damage should be minimised.**
- **Down-time when unavailable for use should be minimised.**
- **Cleaning (eg paint removal) should not degrade furniture (eg affect appearance, water resistance) *Risk factor:* furniture sited in wet location.**

Design Guidance – stand in function – statement of function

- Secures bike & components (eg wheels) against theft by anchoring to environment, and supporting a discriminator function (captive or user's lock)
- May secure components of bike against theft by enclosing in lockable container or by wrapping main stand around them, denying access until whole bike legitimately removed via operation of discriminator.
- May shelter environments and pedestrian/cycle users in vicinity of stand against nuisance and conflict by keeping bikes out of way of pedestrian paths.
- May shelter cycle users and other people near stand, against nuisance and conflict by rationing of parking places & by regulating movement of bikes.
- May enable secure acquisition of revenue from parking facilities by taking/ storing cash or transacting card payment for locking & release of bike.
- May enable the secure operation of bike rental schemes.
- May safeguard environment and all users against terrorist bombs by directing bike parking to less harmful locations (eg out of the immediate way of crowds), or by mitigating harm directly through design (eg by deflecting blast).
- Self-protection against criminal countermoves for disabling security function and misuse in furtherance of other crimes – partly under furniture as object.

Design Guidance – furniture in function – prevention of failure of security function [1]

Misappropriation

Theft of bike by unbolting, cutting, lifting, loosening stand

Design requirements to reduce <u>probability</u> of security failure events

- **Fixings, foundation & anchorage should resist detachment/ working loose.**
- **Stand should resist cutting/bending, where this would allow removal of bike.**
- **Stand & anchorage should *appear* robust against these actions, discouraging offenders from even trying and thus causing damage even in failed attempts.**
- **Any detachment/cutting should be tamper-evident to users and/or guards/ managers. Consider communications to alert, inform & empower users.**
- **Maintenance/repair of anchorage should be easy to inspect and undertake.**
- **Actions to detach or cut stand (unbolting, working loose or cutting) should be obvious in sound, sight of movement, and if possible, intent.**
- **Unbolting etc should require specialist tools and should be difficult with likely hand tools brought by offenders or acquired adventitiously nearby.**
- **Subject to requirement for legitimate use, and maintenance/ replacement, access & space to undertake detachment/cutting action should be constrained.**
- **If stand detached from anchorage, bike + lock should not be easily removable (eg by sliding off free end) from loose remains of stand, but should stay attached as encumbrance (discouragement through increased effort to complete the separation) and deterrent (offender's perceived risk of detection).**

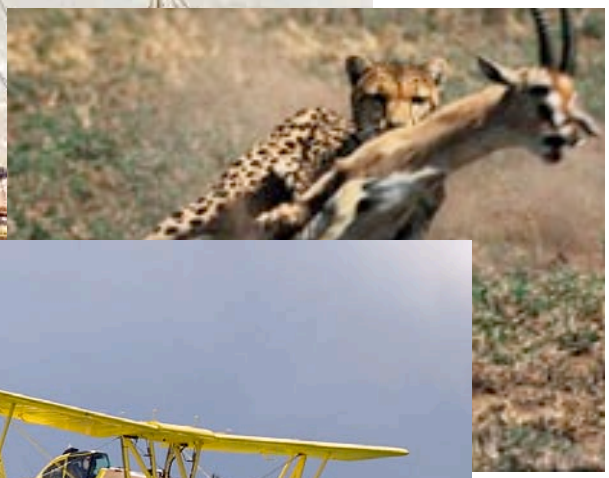
Inventiveness

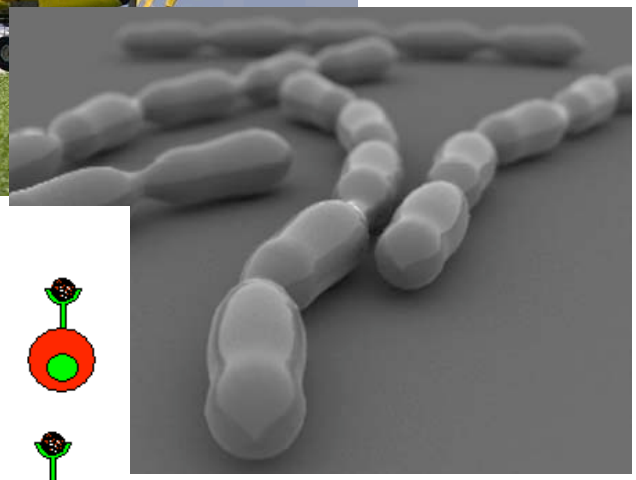
Gearing up against crime – Strategy for arms races

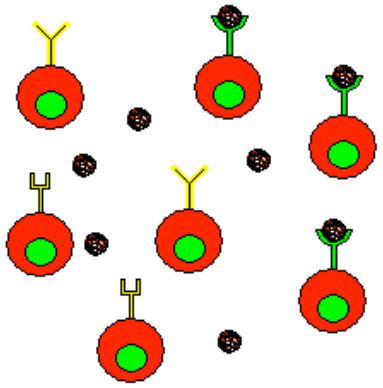
- Encourage variety
- Design to performance standards/ generic principles
- Study offender resources – current and future
- Exploit new technology for prevention
- Avoid rigidity
- Future proofing
- Pipelines
- Learn from other **evolutionary struggles**

Learning from other struggles

- Military
- Predator-prey
- Pest-farmer
- Bacteria-antibiotic
- Immune system-virus







Boosting inventiveness to cut crime whilst respecting the tradeoffs

- **TRIZ** – a theory of inventive principles
- Based on analysis of **oodles** of patents
- 40 generic **Inventive Principles**
  - Including the comb-over?
- 39 **Contradiction Principles** – the sharper-expressed the contradiction, the easier the problem to solve…link to troublesome tradeoffs and the fundamental contradiction at the heart of crime prevention (user-friendly, abuser-unfriendly)
- **Lookup tables** – what inventive principles solved what contradictions in past?
- Analysis of **evolutionary trends** of invention (solid > segmented > flexible > field) – look for what's likely to be next to limit search for next solution

DAC isn't always complex or expensive

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Paul Ekblom

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