

Environmental primitives – from Bikeoff project 2007

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This note, deriving from the [Bikeoff](#) project, lists provisional thoughts on the generic properties of environments of interest to Situational Crime Prevention, and CPTED. These properties might have their **criminogenic** or **criminocclusive** effect on any of the crime roles (offender, preventer, promoter, victim) via diverse causal mechanisms, individually or in combination:

- **Physical** (eg blocking of movement)
- **Psychological** ones (eg perceived/anticipated discomfort of cobbles)
- **Interpersonal** ones (eg someone guarding entrance)
- **Social/cultural ones** (eg rules/ norms about private space activated by symbolic marking out of territory).

I have included some relevant **script clashes**, though not exhaustively. These are where the scripts of the individual roles interact – e.g. pursue vs escape. The designer's task is to arrange the environment to favour the good guys over the bad.

The primitives

1. **Space – Containment and configuration** – a property enabling the **presence/containment over time of agents/players, target goods, in-situ resources, and all features of environment**
 - **Trace and track** – properties enabling security functions wherein offenders, promoters and (where relevant) users can be linked to particular place and/or time – eg footprints, fingerprints, material caught on barbed wire; mud, paint etc on shoes linked back to place.
 - **Security adaptations** – surfaces and substances designed for deliberately serving security functions of capturing traces or imposing tracks – fingerprint-friendly, CCTV recording: smart water/dust, radio trackers picked up like burrs from special furniture or gateway.
 - **2-D Barriers** – creating separate **zones** for people to be in
 - **Security adaptations** – conflict avoidance – eg rival soccer fans in different ends of stadium; separation of families with kids from young men
 - **3-D Enclosures** – separating off large zone of space for specific function, normally with some kind of closable and perhaps lockable door or barrier for pedestrians or wheeled vehicles
 - **3-D Recess** – opening off a wall or frontage, open onto street or other access route.
 - **3-D Containers** – separating off small part of space for specific function without necessarily sealing it. eg litter bin, salt container. [how relate to enclosure? Enclosure can have space for human entry/movement] [may or may not be lockable]

- **Criminal misuse/abuse** – eg temporary stash for stolen goods, concealment for bomb
- **Security adaptations** – eg safes, lockable bike parking containers, see-through bins
- **Countermoves** – eg criminals disguise bomb as litter
- **Counter-countermoves** – e.g. bomb proofing litter bins (?)

Typical script clashes between users/abusers:

Gain/deny access; challenge/reassure; ...?

2. Movement – Accessibility/permeability – a property enabling the **physical movement of agents into, within and through the environment** via:

- **Paths in**
- **Paths out**
- **Paths through**

In each case, access can be influenced by features (here described functionally with technical equivalent example):

- 2-dimensional **Barriers** (eg a wall) separating **Zones**
- 3-dimensional **Enclosures** with side and/or top barriers, interior zone, entrance and periphery (area immediately outside) (eg a parking compound)
- 1?-dimensional **Entrances** (restricted entrance to zone or enclosure with – would you include pavement marking here such as the stuff they do around ATMs?)
- **Speed reducers** (avoidance/mitigation of collision) (eg speed bumps)
- **Effort increasers** (eg gradient)
- **Discomfort increasers** (eg round cobbles)
- **Security adaptations** – all the above can be security adapted – eg compound can be made secure with a gate lock and/or a guard; speed bump enhanced to spoil criminal getaway... and to reduce fights from collisions

Typical script clashes between users/abusers:

Collision; approach/avoid; pursue/escape; ...?

3. Force/action – a property enabling/facilitating or resisting the **application of force or other manipulation by agents** (eg via electronic controls), to move or damage some entity via:

- **Anchorage** (eg bike stand)

- **Friction** (makes it hard to drag some thing ie horizontal movement) (eg rough/sticky floor)
- **Anti-lift** (barrier to make it hard to lift things over to take them away ie vertical movement) (eg wall with barbed wire top)
- **Narrows** (can't remove large thing through narrow gap) (eg gate to prevent removal of bikes whilst allowing movement of pedestrians)
- **Resistance to damage to environment itself (and its features)** (target hardening/softening of environment and its features) (eg reinforcement of buildings, construction of protective enclosures to keep people/tools at arms' length)
- **Security adaptations** – all the above can be security adapted (eg anchorage can be made secure with a bike lock, which may in turn have a counter-counter adaptation eg anti-tamper alarm on cable)

Typical script clashes between users/abusers:

Attack/defend; remove/retain; damage/resist

4. Perceptual/sensory clarity – a property supporting/hindering distal (ie not haptic) **perception by agents using Sight, Sound, Smell or Electromagnetic field** for whatever honest or dishonest purpose (NB these are *informational* properties distinct from the simpler causality that goes through the 'motivational/emotional properties' at 6 below, although many will have their effect via being perceived – eg red light/paint may via some 'primitive' nonsymbolic neurological mechanism make people less relaxed).

- **Sight**
 - **Light** (admittance of daylight, streetlight)
 - **Security adaptations** – street lighting designed to minimise shadows; responsive movement-sensitive light, and movable searchlights designed to aid surveillers and deter offenders [is there some distinct generic thing about warnings etc?]
 - **Sightlines** (axial lines, obscuration from cars, barriers or crowds)
 - **Dog-legs** (sharp left and right turn (or vice-versa) in alley/corridor), **Sight screens, Barriers, Recesses, Enclosures, Containers**
 - **Security adaptations** – mirrors, one-way glass, CCTV, special alignment of bike stands to aid surveillance, raised plinth for staff to improve view. Transparent barrier, see-through bin. NB sometimes crime preventers may want *not to be seen* by offenders, for increasing risk by uncertainty/surprise, hence **covert**; other times they may want to deter, hence **overt** eg

design to make presence of guard, possibility of surveillance, obvious.

- **Discrimination** (do target, offender, user, guard, stand out from background?)
 - **Security adaptations** – camouflage, clarity of lines and surfaces, ease of keeping tidy (design for maintenance and management), **movement amplifiers** (things which require offender to make obvious and/or out of place movements which might attract visual attention)
- **Sound**
 - **Background sound** – low to aid surveillance, reduce stress, annoy young hangers-around eg Mosquito (ethically dubious high-pitched sound generator intended to drive away young people)
 - **Foreground sound** – movement or action amplifiers eg crunchy gravel (inc microphones/sound detectors of varying smartness)
 - **2-way sound** – eg talking CCTV, entryphones
- **Smell**
 - From **target** - thief stealing freshly-cooked food through window
 - **Offensible space** – e.g. drug user attracted to drug den
 - **Security adaptations** – (detecting arson, drugs, explosives/CBRN...?)
- **Should 'Touch' be included?** A way to make touching the bike lock, stand, barrier, etc less attractive to offender – eg electric fence, anti-climb paint, permanent dye emitted from a broken lock?
- **Electromagnetic** (wireless communication, RFID, PIR etc)
 - **Security adaptations** –

Typical script clashes:

See/be seen; ambush/warning; conceal/surveil

5. Understandability/readability by, communication to, agents

- **Intelligibility of street layout** – eg easy-to-follow grid pattern
- **Intelligibility of building layout** – ditto
- **Sight lines** – can people see where they are going relative to landmarks, visible distant junctions etc?)
- **Signage** – deliberately designed to aid understandability/readability; communicate rules (défense de cracher etc)
 - **Security adaptations** – Deterrent/discouraging messages aimed at offenders/deliberate promoters; statements of rules; alerts to risk of

crime; empowerment via warning info ('how to avoid bike theft' sticker), turning innocent or careless promoters into preventers.

Typical script clashes:

Inform/confuse, alert/distract (as with pickpocket, robber or fraudster tricks)

- **Motivational/emotional aspects** – exerting causes on agents
- **Comfort/stress/mood influences**
- **Ownership**
- **Inherent attractiveness of environment/Inherent unattractiveness of environment** including aesthetic/offensive
- **Conflict generation** – collisions, noise, territory, décor etc

Typical script clashes:

Don't often directly apply to *users/misusers* because this set of properties is about causation, not goal-directed action. But could apply to rival *designers* – eg those designing and counter-designing environment to avoid/create stress, ownership/indifference, conflict – includes graffiti merchants and cleaners, damagers and repairers