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# IMPACT OF HOUSING DESIGN ON CRIME

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## Synonyms

Situational Crime Prevention

## Definition

The article provides a brief outline to the field of Crime Prevention through Environmental Design (CPTED) and explains how the application of CPTED to housing design can contribute to reductions in crime and consequent benefits to residents' quality of life.

Christmann and Rogerson (2004), following a secondary analysis of a household survey data, concluded that measures to reduce crime in a neighbourhood can make an important contribution to enhanced quality of life. The following discussion describes measures to prevent crime through the manipulation of the physical environment in and around residential neighbourhoods. It should be noted that the principles can be extended to cover the prevention of crime and enhancement of quality of life across other realms of life including the work place, across public transport networks and in leisure time (Crowe, 2001).

CPTED aims to reduce the possibility, probability and harm arising from criminal and related events and contributes to enhanced quality of life and community safety through the processes of planning and design of the environment (Ekblom 2011). Cozens, Saville and Hillier (2005) present the most recent outline of the approach and identify the key underpinning principles as of CPTED as defensible space, territoriality, surveillance, activity support, access control, target hardening and image maintenance and control. After a brief explanation of each of these principles, the supporting research evidence will be outlined.

The creation of **defensible space** (Newman 1973) relates to the physical design of a neighbourhood that fosters people's latent sense of control over the spaces in which they live. Defensible space provides buildings and enclosures that help the owners and legitimate users of a space to keep illegitimate users and criminals out.

The creation of defensible space can be facilitated through design features that foster territoriality; the human motivation to control space. **Territoriality** helps users of spaces to distinguish between public, private and semi-private space, for example through the use of fences, signage and landscaping. Territoriality can, **therefore**, foster informal social control by facilitating and increasing the motivation of, those responsible for a space to ensure control over it.

**Surveillance** involves using design to assist people to act as guardians of their neighbourhood, increasing the probability that residents will spot suspicious or criminal behaviour and then take appropriate action. Surveillance can be assisted with technology, but also includes natural surveillance, which ensures that clear sight lines give maximum visibility and ensure that people are able to see and be seen by others.

**Activity support** ensures that there are sufficient numbers of people in, or passing through, a particular place, conducting routine, honest activities like shopping or dining; in so doing, their presence prevents or discourages offenders from committing crime.

Defensible space can be enhanced through **access control**. This includes both formal physical measures but also more subtle measures that aims to seamlessly guide users entering and exiting a space through the careful placement of signs, entrances, exits, landscaping and placement of features in the environment.

**Target hardening** ensures that physical structures such as walls, windows and doors are resistant to attack and/or penetration by criminals.

**Image and maintenance** are concerned with protecting the aesthetic appearance and social reputation of a building, place or neighbourhood. Maintenance ensures the continued use of space for its intended purpose and serves as an additional expression of ownership.

It should be noted that while analytically distinct, these elements of CPTED are rarely, if ever, applied in the environment in isolation. This produces challenges for evaluating the individual elements of CPTED and for isolating the precise mechanisms through which CPTED operates.

## Description

### Theoretical background

Before outlining the evidence base for CPTED, it is important to understand its theoretical underpinnings. This is because CPTED stems from a branch of criminology, sometimes referred to as 'Criminologies of Everyday Life' (Garland 1996) that represents a departure from 'traditional' criminological approaches. Traditional criminology has sought to explain the onset and development of criminal motivation. In contrast, Criminologies of Everyday Life seek to explain the processes that lead to the commission of criminal events. Ekblom (2011) distinguishes between the distal, longer term causes of criminal motivation and the proximate causes that prompt action at that time and place of a criminal event. Distal causes have provided the focus for traditional criminology; proximate causes are the principle focus of CPTED. Three, closely related, theoretical perspectives highlight the role of proximate causes and form the foundation of CPTED. These are Routine Activity Theory, Crime Pattern Theory and Rational Choice theory.

- Routine Activity Theory presents an explanation of the impact of social change on the supply of criminal opportunities Cohen and Felson (1979) argue that three elements are required for a crime event to occur, a motivated offender, a suitable target and the absence of a capable guardian. Changes in the daily life of a community bring these elements together, or disperse them, altering the number and nature of available crime opportunities. Examples of social changes which alter the supply of crime opportunities include; an increase in the availability of expensive consumer goods constituting an increased range of suitable crime targets and an increase in activities conducted away from home, leaving dwellings 'unguarded' for longer periods
- Crime Pattern Theory (Brantingham and Brantingham, 1993) presents a more localised explanation of the unequal distribution of crime opportunities and how these are encountered by offenders in the course of their routine activities. Research has demonstrated that criminals are more likely to offend within their 'awareness space' that is, the locations visited during the course of their everyday lives. Crimes tend to cluster around the key pathways that connect regularly visited locations as it is along these 'pathways' that offenders identify and select opportunities for crime.
- The Rational Choice Perspective (Clarke and Cornish, 1985) contends that offenders are goal-directed, choice making actors. The perspective provides a micro level explanation of the decision making processes undertaken by offenders once an offender recognises a crime opportunity. This

includes the a 'criminal calculus' during which the offender assesses the rewards of crime commission are outweighed by the effort and risk.

Bringing these three perspectives together we can conclude that crimes can be prevented by taking steps to reduce the supply of crime opportunities (Routine Activity Theory) and offenders' access to them (Crime Pattern Theory), and aim to manipulate offenders perceptions of the risks, efforts and rewards of offending (Rational Choice Theory).

## Research Evidence

Over 50 years of research has amassed a great deal of evidence on the influence of environmental design on crime. In a review of over fifty research papers, Armitage *et al.* (2010) found general consistency in findings relating to what works in design against crime within residential estates. Successful design approaches can be identified at the level of the neighbourhood, the design of individual homes and with the application of security features to existing homes.

## Neighbourhood Layout

The area of housing design that has arguably received the most attention is the layout of residential streets and the degree to which they are connected with the surrounding environment. This is referred to variously as through-moment, connectivity, and permeability. Research has operationalized 'through-movement' in a number of ways, including calculating the degree to which streets are connected to other streets and by classifying street types and comparing through-roads (highest through-movement) with culs-de-sac (lowest through-movement). The majority of research studies have found that houses located in estates or neighbourhoods with high levels of through movement, are at higher risk of crime. Overall findings have been consistent across different countries and with different methodological approaches.

The evidence base overwhelmingly suggests that street layouts that allow vehicles and pedestrians to move easily through a neighbourhood are associated with higher crime. Housing estates that are situated on key routes, or provide short cuts from one place to another inhibit defensible space and diminish residents' abilities to exhibit territoriality. Several studies found that being located on a true cul-de-sac (with no pedestrian and vehicular connections) reduced the risk of victimisation (Armitage, 2006; Armitage *et al.*, 2011; Johnson and Bowers, 2010). Other studies have shown that the closure of streets can lead to a reduction in crime levels (Zavoski *et al.*, 1999). Johnson and Bowers (2010) found that crime rates were highest amongst those streets with the greatest number of connections to other streets.

Three underlying mechanisms are thought to be responsible for the role of through-movement in increasing crime. Firstly, housing developments that allow vehicles and pedestrians to move easily through the neighbourhood provide easy routes for entry and escape by potential offenders (see for example Taylor and Gottfredson 1987, and Poyner and Webb 1991). Secondly, housing developments with are situated on common routes to and from other places are more likely to fall within awareness space, of potential offenders allowing offenders to select target properties as they take part in day to day activities (for example see Wiles and Costello 2000). Finally, developments with high levels of through-movement offer increased levels of anonymity for potential offenders, as strangers moving through the neighbourhood are nothing unusual (for example see Taylor and Gottfredson 1987).

However, there is one notable exception to the evidence regarding through movement. Studies conducted using Space Syntax techniques (a mathematical approach which models how each street segment connects to other streets at the local and wider area) have concluded that increased levels of through movement are associated with lower risks of crime (see Hillier and Sahbaz, 2009). One explanation for the disparity between

these contrasting findings is that, although Space Syntax allows a greater number of properties to be analysed (Hillier and Sahbaz looked at 101,849 properties), by the same token this means that presumptions are made about movement and patterns rather than observing how a development is really used.

Whilst the vast majority of criminological studies point to low connectivity as a crime reductive factor, increased connectivity is frequently viewed as a positive feature in urban design. The key benefit of connected developments is that they ensure that people can get from A and B without taking unnecessarily lengthy routes. Permeable designs also allow public transport to travel close to residential properties. Therefore, permeable designs are associated with reducing the dominance of the car and the associated noise, pollution and carbon emissions. These are factors that are also known to effect quality of life; thus highlighting a potential conflict in different quality of life objectives.

In addition to connectivity, neighbourhood layouts can help to foster territoriality. Brown and Altman (1983) and Armitage (2006) found that both symbolic and physical boundaries (around individual properties or around entire estates) contribute to lower levels of crime. Not all research supports this link, Macdonald & Gifford (1989 cited in Reynald 2011) found that the presence of physical barriers had no effect on burglars' target selection. Coupe and Blake (2006) suggest that these aspects of territoriality may be counter-productive in providing offenders with opportunities for concealment. Merry (1981 in cited Cozens et al 1995) argued that the factors which signal territoriality will vary between cultures, neighbourhoods and individual groups.

In theory, gated communities provide the ultimate form of access control, although these are rarely recommended by proponents of CPTED. Blandy (2003) concluded that gated communities are not an effective response to crime and disorder problems. They are generally unattractive places to live, fear of crime can be higher than non-gated communities and such estates generally foster a poor sense of a community. Armitage et al (2010) found that the gated communities in their sample did not display lower crime compared to non-gated communities. Site visits revealed that access control at these estates was actually very poor with each of the gated estates having a number of points at which illegitimate access could be gained with ease.

There is a growing body of research on mixed-use neighbourhoods that suggests opportunities for crime are reduced by virtue of the increased range of activities (Poyner and Webb, 1991). It is contended that the systematic zoning of areas for particular uses reduces the number of potential "eyes on the street" (Jacobs, 1961). Steps to increase mixed use within a neighbourhood include the provision of residential properties above retail units.

A final element of estate design that can influence crime is the image and maintenance of the estate. These factors can be addressed in the design stage through attention to architectural details and the use of durable materials. However, ongoing management is also required. Much research suggests that the routine maintenance of the urban environment will significantly assist in reducing crime (notably Wilson and Kelling, 1982 and more recently Cozens et al., 2001). Wilson and Kelling's "Broken Windows" thesis stressed the vital importance of maintaining the environment as a physical indicator of levels of social cohesion and informal social control. It is important to stress that image alone may not be a crime reductive factor. Armitage et al (2012) demonstrated that many housing developments considered excellent in terms of their design and architecture do not incorporate the design features associated with lower rates of crime. Therefore good design, image and maintenance are not sufficient in isolation to prevent crime.

### House design

Research has shown the features of an individual property, and the location of a property in relation to others can influence access control and the risk of crime. High rise housing (flats/apartments) is often perceived to be at greater risk of crime; however, the research here is conflicting. Newman and Franck (1982) found that the greater the number of storeys within a development, the higher the risk of crime. In contrast, Hillier and Sahbaz (2009) found that flats had the least risk of burglary. Hillier and Sahbaz's results suggested that the higher the number of sides on which a dwelling is exposed (high rise flats above the ground floor not at all;

detached houses on all four sides), the more vulnerable a property is to burglary. In a similar vein, properties located on a corner plot have been associated with higher risks of burglary (see Armitage et al 2011). The literature supports the role of surveillance in influencing burglars' selection of target properties; properties that are not overlooked by neighbouring houses are more attractive to burglars (Armitage et al 2011, Winchester and Jackson 1982 Brown and Altman 1983).

In line with crime pattern theory, properties that are more likely to fall within offenders' 'awareness space' are at higher risk of crime. For example, houses that are located within proximity to a road junction, a main road, public footpaths, a commercial business establishment, a park, church or main road have all been shown to be at higher risk of burglary (Winchester and Jackson, 1982; Groff and La Vigne, 2001; Armitage, 2006).

Research evidence on the influence of security measures in preventing residential burglary is mixed. Maguire and Bennett (1982) found that security measures were of little consequence to burglars when searching for a suitable target. However, other studies suggest that with all other factors being equal, burglars prefer to offend against properties with lower levels of physical security. Budd (1999) found that security measures reduced the likelihood of burglary to dwellings.

### Future development

Authors from 'traditional' divisions of criminology have suggested that design is not the means through which the social problem of crime should be reduced. They argue that approaches such as CPTED ignore broader social causes and only serve to support social problems in the long run. Criticisms of this nature stem from social determinism and assume that proponents of CPTED advocate an equivalent architectural or design determinism. There are, however, increasing proposals to incorporate a social element in a 'second generation CPTED' (Saville and Cleveland, 2003); for example, by incorporating measures that aim to foster community cohesion. The incorporation of the social is critical when it is recognised that physical measures do not operate in isolation but are instead mediated by neighbourhood factors. This was recognised by Merry (1981) who argued that territoriality cannot be produced through physical design alone as it relies on two factors that are not always present 1) that residents will always be present to look out of windows overlooking other properties and that they will be willing and able to intervene. More recently, Reynald's (2011) analysis revealed that neighbourhood composition is a contributing factor to residents' willingness to intervene and that residents' of high crime areas are more reluctant to intervene than those in low crime areas.

Eklom (2011) argues that CPTED currently has serious limit its practical relevance and may even introduce harmful side-effects including the undesirable fortification. High on his Eklom's list of CPTED limitations is the lack of conceptual clarity. The interchangeability of terms such as connectivity, through movement, and permeability have already been highlighted. Reynald (2011) highlights other key CPTED elements including territoriality have also been variously defined and operationalised. This can lead to confusing contradictions within the evidence base. Future evaluation of CPTED should proceed with clearer definition and operationalisation of concepts; Eklom offers a suggested framework for this development. Further, Reynald (2011) and Armitage et al (2011) both call for further studies that employ observation. Examination of estates on the ground can reveal surprising findings that help to understand why CPTED is, or is not, effective in a specific context.

Improved conceptual clarity will better reveal the complexities through which CPTED operates. This will allow for a more informed investigation into how different elements of CPTED interact. For example, several authors have highlighted the apparent contradiction between the territoriality and opportunities for natural surveillance, a contradiction confirmed in Reynald's observational study (2011) which found that these measures of were negatively correlated.

### Conclusion

Housing developments last a long time and their crime consequences are correspondingly long-lasting. Studies have amassed a great deal of evidence to support the crime reductive effect of CPTED principles as

applied to housing. CPTED has been an evolving concept since its inception, and is currently undergoing further re-definition with the emergence of 'second generation CPTED'. Successful re-construction offers the potential to further clarify the evidence base and to provide richer and more holistic housing design solutions.

## Cross-References

[Refer to related entries in the Encyclopedia of Quality of Life Research; please find the complete list of all contributions at <http://oesys.springer.com/QUIRE> by going to "download current List of Contributions as a PDF document".

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