Environmental design for safer communities
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THE ROLE OF ENVIRONMENTAL DESIGN IN PREVENTING CRIME IN SOUTH AFRICAN CITIES AND TOWNS

Preventing crime has become a key challenge to government in post-apartheid South Africa. However, a review conducted for the National Crime Prevention Strategy (NCPs) in 1997, of the extent to which environmental design for crime prevention is being implemented, suggests that there is little experience to draw from in South Africa. Design professionals also rarely use crime pattern analysis in the design process. Therefore, a careful regard of the extent to which environmental design is being utilised to prevent crime is crucial if environmental design changes are to address the real problems.

In this regard, government’s core policy document, the NCPs, places environmental design firmly on the agenda. In addition, the White Paper on Local Government expects local authorities to play a key role in implementing two of the four focus areas of the NCPs, namely environmental design and promoting public values and education.

Apart from government legislation, the public is also pressurising local government to respond to the crime issue. Communities participating in workshops to develop Land Development Objectives (LDOs), required by the Development Facilitation Act, have in many cases prioritised the need for greater safety above all other needs. Local and international business interests have also highlighted the impact of crime on tourism and foreign investment. With this in mind, a focus on crime prevention through environmental design is indeed warranted.

Crime in South Africa affects different people and parts of the city in different ways. This has important implications for planning and the prioritisation of design interventions. Crime patterns and trends in poorer areas such as townships and informal settlements differ from those in wealthier suburbs, which in turn differ from those in inner city areas.

The poorer inhabitants of the city are generally most vulnerable to violent crime, but they do experience a significant proportion of property crime. Suburban residents are more likely to be the victims of property crime, and they experience comparatively low levels of violence. In inner city areas, violent crimes targeting property predominate. Environmental design can make an impact on some types of crime in each of these settings, as well as alleviate the fear of crime.

Given this present situation, the next section will shortly define the concept of crime prevention through environmental design. This will be followed by the fundamental principles of environmental design to prevent crime, accompanied by some of the important recommendations to be considered when applying these principles to settlement planning. Finally, the application of these principles will be highlighted.

THE CONCEPT OF CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN

The notion of adapting and exploiting the environment, particularly the built environment, to assist with crime prevention is not new. Take, for example, the defensive walls that were built around medieval towns to protect the inhabitants from intruders. This was, in effect, using environmental design as part of a strategy to prevent crime.

During this century numerous studies have been conducted and many documents written on the relationship between environmental design and crime. Over the past 30 to 35 years, a number of schools of thought have emerged around the idea of crime prevention through environmental design. The international literature and the main components of recent thinking on the subject are outlined in the following South African publications, namely, Safer by Design (Kruger et al 1997), Environmental Design for Safer Communities in South Africa (Napier et al 1998) and The History of Crime Prevention through Environmental Design: A Comparative Study (Meyer and Qhobela 1998).

Today, it is generally accepted that certain types of crime can be limited if the environment is designed appropriately. Design initiatives form an integral part of crime prevention strategies in countries like Canada, the United Kingdom, the United States of America and The Netherlands. A great deal of research on the topic has been done internationally and numerous publications are available. However, little research has been done as yet in South Africa.

Environmental design as currently practised is often indistinguishable from target-hardening (for example, building higher walls and securing property against crime). Target-hardening is, however, only one component of environmental design to prevent crime. Crime prevention through environmental design can be defined as the implementation of measures to reduce the causes of, and the opportunities for, criminal events, and to address the fear of crime through the application of sound design and management principles to built environments.

Understanding crime is critical to its prevention. Whether or not a crime occurs depends on the interaction of several elements. These elements include the physical and social environment in which a crime occurs, the presence of active or passive forms of surveillance, the perpetrator, and the target or victim...
of a crime. The form of the built environment can influence these elements and several design principles are fundamental in designing to reduce crime.

**PRINCIPLES OF CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN**

A number of basic principles emerge as fundamental in designing to reduce crime. While these principles are universal in the design of safer environments, they have been adapted to suit the characteristics and dynamics of South African cities. Most of these cities were shaped by apartheid planning principles, which contribute to the crime problems. With this in mind, crime prevention through environmental design becomes an even greater challenge.

The backdrop for these principles is, therefore, the South African city. This is the typical physical and social setting within which designers and decision makers are working, and fundamental restructuring is crucial if equitable and safer cities are to be achieved.

These basic principles are

- surveillance and visibility;
- territoriality and defensible space;
- access and escape routes;
- image and aesthetics; and
- target hardening.

These principles are applied through recommendations for crime prevention at three levels: city, neighbourhood and site. The following section will highlight only a few of the recommendations for the city and neighbourhood levels, since these are directly relevant to settlement-making. A more complete set of recommendations can be found in the publication: Environmental Design for Safer Communities in South Africa (Napier et al 1998).

**Surveillance and visibility**

Passive surveillance is the casual observance of public and private areas by users or residents in the course of their normal activities. It can also be referred to as the presence of “protective eyes”. The extent of visual contact people have with a space and whether their presence is visible determine whether they can intervene and whether users feel safe.

Passive surveillance depends on a range of factors including the placing of windows, doors and other openings, the distances between buildings, the sizes of public spaces, vacancy rates and degrees and types of use. The zoning of city areas and the functionality of buildings are key elements in determining whether protective eyes are present day and night, or not. Multifunctional land uses, rather than monofunctional zoning are required to ensure long hours of use.

Active surveillance refers to surveillance by police or other agents whose express function is to patrol an area.

Surveillance is improved if there is good visibility. **Visibility** is the degree to which an environment is made visible by elements such as lighting and uninterrupted lines of sight. Dark or twisting streets, alleys, entrances and doorways can act as havens for potential offenders and increase residents’ and visitors’ fear of crime. The way in which lighting is designed and positioned, and the way roads and paths are laid out can obviate many of these problems and render environments and users visible to anyone in the environment.

The following are a number of the ways to ensure surveillance.

- **Design and zone streets and squares to allow long hours of use and so act as organising elements for the location of varieties of facilities.**

**Figure 5.8.1.1 Increase opportunities for passive surveillance**

These facilities can then ensure the presence of protective eyes, both in the day and at night.

- **Design neighbourhoods so that people are encouraged to intervene quickly and effectively to modulate crime.**

This can be promoted in a number of ways - for example, through the proximity of buildings to each other; the number of people accommodated there; the orientation of the buildings and how this impacts on surveillance; the design of shared entrances and access routes; the human scale of the area; and the provision of inviting and well-defined outdoor spaces which are conducive to users meeting and communicating (see Hard Open Spaces (Sub-chapter 5.3), specifically, functions of hard open space and user groups).
• Ensure sufficient and adequate lighting is provided along streets to improve surveillance.

Figure 5.8.1.2 Importance of sufficient and adequate lighting

The lighting of public spaces improves surveillance and visibility, allowing users to see and anticipate possible danger. Lighting can also be used to guide people along safer routes. Therefore, the pools of light from streetlights should overlap to form a continuous band of light along pedestrian routes and in front of entrances. The position of streetlights should also coincide with bus stops or, ideally, there should be higher levels of lighting at such places.

• Encourage pedestrian traffic and direct people along certain routes as this optimises passive surveillance.

Figure 5.8.1.3 Route layout and pedestrian movement

The more the street is used, the greater the potential for passive surveillance. Surveillance by pedestrians is more effective than surveillance from passing cars. All paths and pedestrian routes should be in areas where there is surveillance, good lighting, controlled vegetation and high levels of activity (see Movement Networks (Sub-chapter 5.1), specifically, mixed pedestrian-vehicle routes).

• Locate small neighbourhood parks and other public open spaces so that they can be overlooked by buildings and/or well-used streets.

Figure 5.8.1.4 Location of small open spaces

In order to optimise passive surveillance, the location of small open spaces is important. As they serve a neighbourhood cohesion function, these spaces should be strategically located within the neighbourhood (see Soft Open Spaces (Sub-chapter 5.4), specifically, the location, size and dimension of parks).

• Ensure high levels of visibility when landscaping parks, public squares or pedestrian routes.

Figure 5.8.1.5 Landscaping and visibility

Where possible, the entirety of an open space should be visible to users of such a space and to passers-by. Trees, bushes and other landscape features can obstruct sight lines and provide cover for potential offenders and criminal activities, but if selected and maintained properly, can ensure visibility.
Territoriality and defensible space

The comment has been made that residents of South African cities should be encouraged to again assume ownership of their neighbourhoods. This is essentially a case of territoriality. Territoriality is a sense of ownership of one’s living or working environments. Places can be designed and managed in ways that encourage owners/users to take responsibility for them through a concept such as “defensible space”. Spaces are defensible if people are able to exercise control over them.

The benefits of increased territoriality include avoiding wasted or “dead” space through the use of areas for explicit purposes, and the greater likelihood of intervention by passive observers because they feel responsible for their environments. The design of building edges and the delineation of boundaries to mark private, semi-public and public spaces make the use of spaces unmistakable to people frequenting the city and increase the chances that they will be owned and maintained by their users.

Territoriality and defensible space can be encouraged in a number of ways.

- Avoid tracts of vacant land without designated uses or control. All spaces should have an explicit purpose and be the clear responsibility of some individual or group.

Open spaces without designated uses, which present themselves as vacant or abandoned land, are likely to become sites for crime. Land is one of the most valuable assets a city has. It should have value added to it through its development rather than be allowed to become a drain on the city’s resources. Buffer strips used to separate land uses, racial or income groups, degenerate into vacant land and should not be encouraged. Since this land does not “belong” to anyone, it is likely that no sense of ownership will develop, and no one will take any responsibility for it.

- Design the public realm so as to increase people’s ability to read the built environment. Create an identifiable neighbourhood character through the layout, architecture, street furniture, landscaping, as well as consistency in the approaches utilised.

When people understand the language of the built environment, their relationship to it improves. This reduces the fear of crime because people are able to locate themselves in the neighbourhood, even if there for the first time. The built environment also plays a major role in establishing an identity. Better identification with the surrounding environment will increase the sense of involvement and responsibility people feel towards each other and, therefore, what happens within this environment.
parks linked through the street network allow people to pass through, stop and chat. Therefore, encourage the establishment of more small open spaces rather than a few large but unmanageable ones. The surrounding communities should also be encouraged to take responsibility for these smaller public spaces through community committees which can be facilitated by local authorities.

- The edges of public open spaces and private properties should be clearly defined so that both residents and passers-by can readily recognise boundaries between public, semi-public and private spaces.

![Figure 5.8.1.8 Clearly definable edges](image)

The definition of boundaries improves the potential for ownership to be understood and exercised over different spaces (see Soft Open Spaces (Sub-chapter 5.4), specifically, edges of parks and play spaces). There are a number of ways to define edges:

- through planting;
- with a low wall or fence;
- through lighting;
- by changing the surface level;
- by using different surface materials; and
- through the use of street furniture or other prominent landmarks.

### Access and escape routes

Access and escape routes are available to both the offender and the victim. Areas of safety that have high levels of passive surveillance and public visibility can act as safe spaces for potential victims.

The sites of certain types of criminal events are often deliberately chosen by the offender, before the act, for access to escape routes. Car highjackings are also often planned to allow quick escape. The layout of transport routes and the juxtaposition of different types of space influence the ease of access and escape. Areas of refuge (e.g. vacant land where people can hide) which have clear routes of escape from a crime are obvious havens for offenders. An example would be tracts of open or agricultural land near a neighbourhood, where stolen goods from thefts can be hidden.

There are a number of ways to limit easy access and escape routes for criminals and promote escape routes for victims through environmental design.

- Carefully plan the location, size and design of large open spaces such as large parks and golf courses so as to avoid their becoming areas of refuge and escape for offenders.

Open spaces that are not visible in their entirety and do not lend themselves to constant surveillance can present a problem. Crime statistics suggest a correlation between the location of incidents of housebreaking and access to large open spaces. Both the size and location of these areas are important factors to consider.

- Avoid ending roads on vacant or undeveloped land. Rather ensure that these end at property edges, at controlled open spaces or in recognised pedestrian paths.

![Figure 5.8.1.9 Avoid ending roads on vacant or undeveloped land](image)
Cul-de-sac leading to and ending on vacant land provide escape routes and should be avoided where possible. If there is control over dead ends by the immediate residents, a degree of responsibility can be exercised over the public space.

- Provide clearly marked and logical pedestrian routes at transport interchanges, to exits, entrances and other functions to avoid confusion and people wandering into unsafe areas. Also incorporate informal traders into any crime prevention strategy.

The entire modal interchange should be designed to provide safe pedestrian routes. Opportunistic crime depends largely on making use of a target’s vulnerability. Struggling to find one’s way without directions and wandering around aimlessly can increase vulnerability. If routes are clearly marked, a potential victim can locate a route of escape more easily. Informal trading can also cause congestion and bottlenecks on pavements. This congestion increases the chances of crimes, such as pick-pocketing and bag-snatching, being committed. To circumvent this congestion, pedestrians have to walk in the road, resulting in increased danger and vulnerability. If informal traders are incorporated into hawkers associations and awarded designated areas at, for example, transport interchanges, they can become valuable contributors to the passive policing of the public realm.

**Image and aesthetics**

The image projected by buildings or public areas in the city has been clearly linked to levels of crime and particularly to the fear of crime. This link is often referred to as “crime and grime”. Urban decay and the resultant degradation make people using these areas feel unsafe.

The design and the management of spaces in the city are both important if precincts are not to become actual or perceived “hot spots” for crime. Vacant land, especially if not maintained, and unoccupied buildings particularly, contribute to decay as do uncleared litter and the breakdown of services.

The image of spaces can be improved by ensuring human scale in design, using attractive colours or materials, providing adequate lighting, and designing for high levels of activity.

The following, are some recommendations that address the issues of image and aesthetics.

- Ensure effective maintenance if environmental design interventions are to be successful in reducing crime.

The functioning and maintenance of streetlights and roads, as well as cleaning of the roads and care of the landscape, all have major implications for crime prevention. Maintenance directly impacts on visibility and access, as well as preventing places from becoming locations for criminal activity.

- Toilet blocks in parks should be clearly visible from all sides, designed as an attractive feature, well maintained and preferably near busy areas of the open space.

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The positioning of buildings in relation to the street and the choice of materials create an image that contributes to, or detracts from, the character of the street and ultimately the character of the area. A more friendly face projected towards the street or city square (hard open spaces) can encourage a sense of safety for pedestrians and, therefore, promote more activity in the street, square or other public open space in front of it. It can also create a more human scale and contribute to a specific environmental character. Together, these aspects can then increase a sense of belonging and security in users.

- Design and manage buildings and public spaces so that they can be easily maintained and kept “grime free”.

International research has shown that the appearance of a public place affects perceptions of safety. Areas which are badly maintained and dirty increase the fear of crime. They may also encourage criminal activity, because such places show no clear ownership and a disinterested management unlikely to provide surveillance or security. The slogan “no grime, no crime” refers to the positive impact of a clean environment.

**Target-hardening**

Target-hardening is the physical strengthening of building facades or boundary walls to reduce the attractiveness or vulnerability of potential targets. Walls around houses and burglar bars on windows are the most common examples.

Target hardening is often the first solution that occurs to residents and designers because it physically reduces opportunities for crime. However, the common mistake is to violate other principles in the process. If target-hardening in buildings obstructs lines of sight or provides unsurveyed havens, the hardening is unlikely to be an effective crime prevention strategy in the long term.

A positive way to promote target-hardening is through the application of appropriate barriers and fences.

- Barriers such as garden fences and security walls should allow for surveillance and be visually attractive to reduce opportunities for, and alleviate the fear of, crime.

High garden walls are not necessarily safe. On the one hand they make the street unsafe by reducing opportunities for passive surveillance from the building behind. On the other hand, they make the building or entire building complex unsafe as they remove the possibility for passive surveillance by casual passers-by or police patrols. Considering this, it is better to replace high walls with a more transparent fence or barrier. Setbacks and recesses in property walls can also become ideal places for potential offenders to hide and wait. This is especially pertinent in South Africa with the number of vehicle hijackings occurring. Therefore, existing recesses should be well lit at night and not contain shrubs that can provide cover.

**THE APPLICATION OF THE PRINCIPLES OF CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN**

The most important point is that, in any given situation, these principles all need to work together to be effective as crime-preventive measures. At the same time they need to be working along with other planning principles for the planning of well-functioning settlements.

It is unrealistic, however, to expect to be able to prevent all types of crime using the same methods, or that crime prevention through environmental design alone can solve all types of crime. Therefore, a sound understanding of the crime patterns in a locality is essential in that particular types of crime can be addressed through particular design responses. Given that crime patterns differ, interventions should not only take into account the ease of implementation, but also consider which problems are more conducive to resolution through design measures and, thus, where the impact is likely to be greatest.
Furthermore, an integrated planning approach is necessary. A coordinated layout of roads, sites and buildings will offer a greater chance for the achievement of a safer design.

Crime prevention through environmental design can be proactive or reactive. In other words, design principles can be applied at the initial design stage, anticipating potential problems, or implemented reactively as retrofit design changes once a problem has developed. It is suggested that the preventive approach is more cost-effective.

Related to this are the potential areas of application. As mentioned in Chapter 2, there are at present three generic urban conditions prevailing. These are greenfield or undeveloped sites, urban restructuring and the upgrading of informal settlements. The opportunity to incorporate crime prevention principles should be utilised when planning developments for these conditions.

Recent crime studies have identified three major areas for intervention in terms of crime prevention and these coincide with the three prevailing urban conditions in need of attention. They are

- preventive action (proactive crime preventive development) on undeveloped sites or areas;
- inner city restructuring as part of overall urban restructuring; and
- the upgrading of informal settlements incorporating crime-preventive principles.

In the past, interventions have largely focused on the wealthier parts of the city, where they are easier to implement, rather than those areas with the greatest need or where the most impact is likely. Identifying appropriate areas and crime problems for environmental design to target requires detailed case studies and the analysis of crime patterns in particular localities.

Those areas with the highest levels of crime in South Africa - townships and informal settlements - could benefit most from focused environmental design interventions as part of broader development and local crime prevention strategies. State interventions in the built environment should prioritise those areas where planning has been lacking, or where existing features are conducive to criminal victimisation.

In contrast to townships and informal settlements, areas like the inner city, often considered the natural targets of design interventions, have comparatively low levels of certain crimes. But the crimes that are prevalent in these public places (for example mugging and robbery) are particularly likely to raise citizens’ fear of crime. This impacts on the way the city is used and, by implication, its growth and development.

It must, however, be emphasised that crime prevention measures are likely to have the greatest effect when applied in the initial stages of new developments. Development programmes aimed at an improved quality of life should be supported as the most effective way of addressing both the causes of crime and the opportunities for crime. For example, adequately spacious housing with privacy for the residents and appropriate communal spaces for community socialisation, would go further in addressing crime than attempts to intervene at a later stage.

In South African cities some opportunities exist for the creation of whole new precincts. Here the full range of urban design measures for safer places can be brought to bear by planners and developers with the added benefit of contributing to safer environments.

The above recommendations dealing with crime prevention are in most cases no different from basic design principles for well-functioning urban environments. It is surprising then, that - when analysing city precincts in the country - many of the principles have been ignored to the detriment of the city’s residents. What seems to be lacking is an awareness that cities, neighbourhoods, buildings and open spaces can be designed to be safer.

Communities are demanding safer living environments and local government is expected to deliver. Within this climate everyone involved should make a deliberate attempt to focus on incorporating crime prevention strategies into current and future development plans.

Safety and security is not a luxury; it is a necessity. Safer environments for the few are not good enough. Therefore, the greatest challenge is to achieve safe cities and towns for all their residents and, along with them viable and sustainable communities. For this to happen social crime prevention and safer design must become an integral part of the culture of all people interested in a better tomorrow and a safer lifestyle.
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