PB TECHNICAL PAPER:
EFFECTS OF URBAN CRIME ON THE URBAN ENVIRONMENT

"Greater concern about terrorism places new opportunities before the design community. If protection is considered from the outset, design can make buildings and people safer."[1]

Introduction

Violent crime was the issue of the nineties, while terrorism has become the talk at the onset of 21st century. Understanding crime prevention design is therefore an invaluable tool in organization and maintenance of order in our societies. Planner and sociologist Duncan describes *" a social problem as a recurrent condition that has been defined by influential groups as a deviation from social standards."*[2] ***When a social deviance exceeds group definition it becomes a crime.***

Urban environment and urban crime

Robert Gold in his article ***" Urban violence and contemporary defensive spaces"*** indicates that CRIME was always widespread during periods of the past. He argues that violent crime has been increasing at an alarming pace, in large metropolitan areas.

"Urban environment and violent behavior [3]

Design and form of the urban environment may directly control violence. The residential areas, for example, may be selected by a criterion of distance from populations with real or assumed tendencies to commit violence, or individual buildings or entire communities can be "fortified" by crime-control features with social aesthetic values subordinated or entirely eliminated. Design and form of the urban environment may invite violence.

Historical background of Urban Crime Preventive Design

Historical responses to crime in the cities of the past are varied, and can be described from the middle-ages to the present as "***a sequence of changing defensive parameters."***[4]***.*** The early Chinese had municipal administrations, the Hebrews had policing and Medieval Europe, had its walled cities. As the cities grew larger, a demand for new forms of protection increased. The city of **PARIS** and its problems of public order are documented and reveal, that its typical pattern of a medieval city increased its crime rates. In 1667, Louis XIV appointed La Reynie, who illuminated the streets within a decade and razed notorious slums, planting trees and re-planning Paris. By the 18th Century Haussman restored public order to Paris, and France was the acknowledged world leader in European architecture and urban design.

Can sound urban planning help reduce urban crime and Violence? [5]

Urban planners are often the boundary spanners between city departments and community residents in terms of crime prevention and control practices. The "City Beautiful" movement at the end of the last century was also based, in part, upon the belief that if people had a more pleasant physical environment, they would be less inclined to commit crime. **From *Filarete's Sforzinda* of the 1460's to *Le Corbusier's Ville radieuse* of the 1930's, the great ideal cities have formed a special category within the utopian tradition. To build the ideal society is to create the utopian society. *Plans for ideal city are important as lacking the vision for new social order, in existing cities has led to disorder and violence.***[6]

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1 Design with fear, Thomas Vonier, Progressive Architecture, August 1985

2 robert a. Dentler. P. 1977. Urban problems perspectives and solutions. Chp 2 urban problem-solving pg. 17

3 W · Mcq. P. 19-- . Cities fit to live in. Chp 1 urban violence and contemporary defencive cities. Robert gold

4 w . Mcq. P. 19-- . Cities fit to live in. Chp 1 urban violence and contemporary defencive cities. Robert gold pg. 5

5 By MITCHELL J. RYCUS (Professor of Urban Planning at the University of Michigan, USA) www.tcaup.umich.edu/publications/pubs.html (29th Apr 2007 @ 1:30 am)

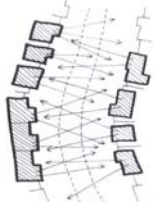
6 The history of Utopia : the chronology of nowhere, BOOK :Utopias- J.C.Davis

Literature Review: Crime free housing by POYNER, BARRY AND WEBB BARR

A Great deal of attention has been given to neighborhood crime prevention. The study had two broad aims: to find out more about the nature, of residential crime and to explore the various aspects of housing layout that were believed to have influenced crime.

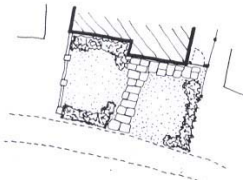
REQUIREMENTS FOR CRIME FREE HOUSING: [6]

1. Moderate locking system, provided the opportunity for crime is reduced by design.
2. Facing windows: The houses should face each other across the street or similar shared access area , to create a system of mutual surveillance.



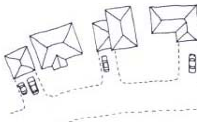
(Fig 1.1)

3. High fences at the sides and rear, boundaries of individual housing plots.
4. Front access to a secure yard, by providing a gateway to the front of the house. The gateway should be lockable and easily supervised from inside.
5. Access for servicing and delivering. It is desirable to provide such a space by the front door, but out of sight from the public footpath
6. Space at the front acting as transition zones.



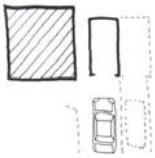
(Fig 1.2)

7. All car parking should be on the hard standings within he curtilage of the house, preferably at the front to facilitate surveillance.



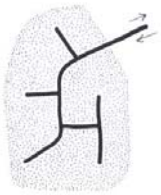
(Fig 1.3)

8. A garages at the side of the road close to the front entrance.

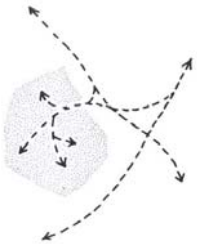


(Fig 1.4)

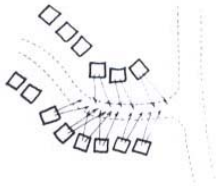
9. Limit road access to an area as it reduces traffic. (Fig 1.5)



10. Avoid through pedestrian routes. Where pedestrian routes are separate from the roadways, they should not be planned to create a series of through routes. (Fig 1.6)



11. Houses should be oriented to face access routes and especially to focus on the entry points to provide intensive surveillance.

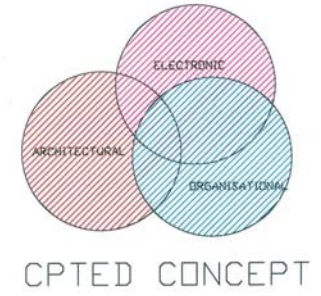


(Fig 1.7)

12. Green spaces outside housing areas, and provided near the entrances.

(Fig 1.8)

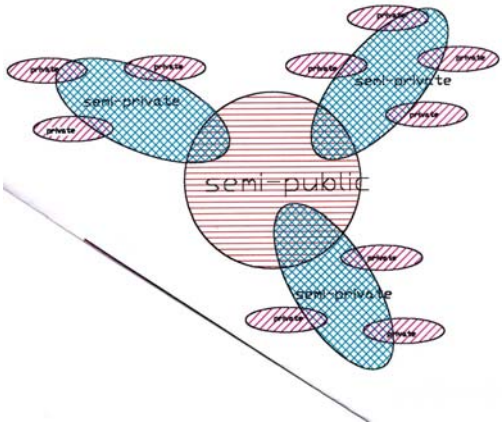
Literature Review: Crime prevention through environmental design By ROBERT A.GARDNER [7]



In the early 1970s, several studies financed through the Law Enforcement Assistance Administration and the Department of Housing and Urban Development demonstrated that architectural design could be used effectively to influence crime rates. These studies showed that by combining security hardware, psychology, and site design, a physical environment could be developed that would, by its very nature, discourage crime. (Fig 1.9)

The goal of CPTED is the reduction of opportunities for crime to occur. This reduction is achieved by employing physical design features that discourage crime, while at the same time encouraging legitimate use of the environment.

CPTED also makes possible designs that offer protection without resorting to the prison camp approach to security. Use of fortress-type construction is minimized, and where necessary, integrated into the overall design, reducing negative visual impact. The uniqueness and success of CPTED stems from the manner in which these techniques are integrated with, and applied to, the architectural design process.



Defensible Space (Fig 1.10)

To provide maximum control, an environment is first divided into smaller, clearly defined areas or zones. These zones become the focal points for the application of the various CPTED elements.

Under the defensible space guidelines, all areas are designated as either public, semi-private or private. This designation defines the acceptable use of each zone and determines who has a right to occupy it under certain circumstances.

Public Zones. These areas are generally open to anyone and are the least secure of the three zones. This is particularly true when the zone is located within a building or in an area with uncontrolled access and little or no opportunity for close surveillance.

Semi-private Zones. These areas create a buffer between public and private zones and/or serve as common use spaces, such as interior courtyards. They are accessible to the public, and separation is accomplished with design features that establish definite transitional boundaries between the zones.

Private Zones. These are areas of restricted entry. Access is controlled and limited to specific individuals or groups. A private residence is a good example of a private zone.

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[7] *This is a revision of an article by the same name originally published in the April 1981 edition of* ***Security Management Magazine****.*

Territoriality

Territoriality involves an individual's perception of, and relationship with, the environment. A strong sense of territoriality encourages an individual to take control of his or her environment and defend it against attack. **A sense of territoriality is fostered by architecture that allows easy identification of certain areas as the exclusive domain of a particular individual or group**.

Surveillance

Surveillance is the principal weapon in the protection of a defensible space. **Environments in which legitimate occupants can exercise a high degree of visual control increase the likelihood of criminal acts being observed and reported.**

Effectiveness and criticism[8]

It has only been since the introduction of 2nd Generation CPTED that CPTED has finally made constructive attempts to enhance social cohesion and build a strong sense of community to impact the motives that cause crime in the first place. Beyond the attraction of being cost effective in lowering the incidence of crime, CPTED typically reduces the overall costs of preventing crime.
Strategy 1: *Provide clear border definition of controlled space.* Through boundry or border definition, the user and the observer must be able to recognise space as public or private. The recognition of ownership allows for those illegitimate users to be spotted.
Strategy 2: *Provide clearly marked transitional zones.* It is a space where the user is made more clearly aware through the design of the environment that a change of ownership is taking place. The effort made to mark the entrance into the space reduces the range of excuses for improper behaviour.
Strategy 3: *Relocation of gathering areas.* The relocation of gathering spaces to areas of good natural surveillance and access control enables those spaces to become more active and likely to support the activity, encouraging public participation.
Startegy 4: *Re-designate the use of space to provide natural barriers.* Defining the boundaries of ownership through the use of distance, natural terrain, and landscape barriers. Also keeping in mind that these landscape elements are not hiding places for criminals.

Safer cities initiative: Urban planners Gerda Wekerle and Carolyn in a co-authored book "SAFE CITIES – Guidelines For Planning And Design Management" discuss urban crime and planning needs for urban safety**.**

Fear of crime

The fear of crime keeps people off the streets, and out of parks, plazas and public transit. **It is a substantial barrier to participation in the public life of the city.**

What can cities do?

There are two predominant approaches to controlling urban crime. The most prevalent response has been to call for greater law and order: more policing, tougher laws, stiffer jail sentences and criminal justice. The second approach has been to focus on the root causes of crime.

Design and planning guidelines for safer cities

Cities involved in crime prevention initiatives often start with the built environment, which involves detailed situational crime analysis to identify localized patterns and the micro-environmental conditions that might be creating opportunities for crime. Early CPTED efforts seemed to be addressing these problems however did not deal with the fear of crime. The safer city approach stresses management and community crime prevention, along with design. Safer cities approaches often incorporate CPTED.

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8 Web Encyclopedia "Wikepedia"

Factors that enhance safety and security

1. **Lighting:** To identify a face 15 meters/yards away, outdoor public spaces lit to the minimum standard of 4 foot-candles. This should include alleys or laneways and other inset spaces, access and egress routes, and signage. Ensure consistency of lighting, Proper placement of lighting, lighting Maintenance and Planning for nighttime use.
2. **Landscaping:** the choice of landscaping materials serving as screens or barriers to surveillance.
3. **Avoid Entrapment spots:** such as elevators, storerooms, fire stairs, dark recessed entrances that may be locked at night, gaps in tall shrubbery, curved or grade-separated driveways, loading docks, Parking lots, gas stations, and used-car lots.
4. **Hardware:** emergency telephones, intercoms, or video cameras
5. **Visibility by others** so that a user is not isolated and this is achieved through improvements in mixed-use and intensity of land-use; and the intelligent use of activity generators. Activity generators include everything from increasing recreational facilities in a park, to placing housing in a previously commercial area, to adding an outdoor café to an office building.

Project related security evaluation

1. Analyze and determine how critical security is to the project.
2. Determine the threats to the project e.g. Sabotage, espionage, terrorism, street crime, workplace violence etc.
3. Determine what modes of attack may threaten the project i.e. covert entry, insider alone, bombing, demonstrations, aerial attack, standoff attack, theft, contamination etc. (Fig. 1.11)
4. Determine the severity of the potential attack and the medium he would use.
5. Analyze the vulnerability of the site in terms of security force capabilities, penetration delay, detection capabilities, assessment capabilities, access control and procedural control.
6. Identify the constraints that will affect the security, like financial and operational.
7. Determine what security measures can be implemented practically.

SECURITY DESIGN STRATEGIES

BUILDING PERIMETER

- Reduce the number of stairwells that exit to the outside
- Make the exit through the lobby when ever possible
- Don't place any entries behind the control point

ENVIRONMENTAL SECURITY STRATEGY

- Establish a physical boundary-separating public from private.
- Design vehicular and pedestrian traffic patterns for natural surveillance.
- Clearly indicate primary and secondary as well as visitor entries.
- Establish physical and electronic control over exterior and interior access points
- Compartmentalize the critical areas for better control.
- Restrict access to storage areas.
- Limit the number of facility exit doors based on operational necessity and fire loading regulations
- Clearly mark site entrances with signs that indicate visitor and vendor processing points.
- Provide adequate lighting and surveillance of employee and visitor parking lots
- Establish a uniform means of identification and access for multi-tenant sites
- Utilize primary and secondary authentication methods for access to highly sensitive areas
- Design floor layout plans with security in mind

STRATEGIES FOR BOMB RESISTANCE

- Establish a secured perimeter around the building as far from the building as possible
- Use poured-in-place reinforced concrete for all framing, including slabs, walls columns and roofs
- Roof and base slabs should be at least 8 in. thick, exterior walls 12 in thick, and columns spaced no more than 30 ft apart
- Use seismic detailing at connection points.
- Reinforce floor slabs and roofs using a two-way rein- forcing scheme
- Design windows that comprise no more than 15% of the wall area between supporting columns
- Reduce the flying glass hazard by using a plastic mylar coating on the inside face of the windows
- Install specially designed blast curtains inside the windows to catch pieces of glass, while permitting the air- blast pressure to pass through the curtain

- Design artistically pleasing concrete barriers as planters or works of art and position them near curbs at a distance from the building
- Design buildings in a simple geometric rectangular lay- out to minimize the defraction effect when blast waves bounce off U-shaped or L-shaped buildings and cause additional damage.

Building Security in the wake of the new terrorist threat

" The increased terrorist threat to government and commercial buildings has made it imperative that a ' security advisor' sub-discipline be included in the building process"[9]

The site: The size of site affects standoff distances as a counter to large bombs. Lines of sight into the site must be considered to protect it from remote aimed weapons such as sniper rifles or rocket-propelled grenades (RPGs). Attention must also be paid to what lies beneath the site in terms of sewers, drain culverts, other tunnels, for obvious reasons in terms of infiltration, bomb-placing and so on. The layout should allow for two entrances (one for emergencies). Planning constraints should be taken into account with regard to walls, space for secure parking and so on.

The perimeter and outer compound: The entrance should be negotiable at speed. Secure parking and wash facilities should be available. Doors and Gates should have electrically-operated locks capable of being activated only from the main building control office in an emergency. All walls should have lines of sight as clear as possible to eliminate hiding places for intruders or bombs. Additional security can be added with concrete planters.

The main building: This main structure should itself be zoned, with the offices as the most secure element. Isolated as much as possible from the others (reception. plant room. stores) and accessible only after screening at reception. Security lights should be placed at a distance from the building facing outward so that security can patrol in the safe, dark zone. The reception zone should have a secure staff escape to the offices (ideally through a door invisible from approaches to reception).

To contain damage from any internal incident, the inner-leaf of external wall and floors as well as fixed internal walls should be reinforced concrete. Bomb resistance can be improved by the relatively simple expedient of adding reinforcement at the top of reinforced concrete floors to resist the tensile stress produced by a bomb-blast from below (simple floors have reinforcement only at the bottom to resist tensile stress induced by the vertical load above). Column and beam linkage should also be strengthened. The inner plant room is supervised via external staircase, not through the offices. The office zone should contain an incident room located close to reception, able to control alarms, shut down (high level) air Intakes and lock all external doors. Offices should have robust doors with secure, quick and easy methods of bolting, and an incident alarm so that staff can lock themselves in or retreat to a central strong room.

External windows should be located so that staff can move desks out of the line of sight (narrow, vertical windows). The chief executive's office should not be located In a top corner with the best views as It makes too obvious a target.

WTC Source (http://www.icivilengineer.com/News/wtc.php)


[9] Article: Building security in the wake of new terrorist threat, JANE'S INTELLIGENCE REVIEW March 2002 by John Hill

Although criminal brutality has in a sense always been with us, terrorism is to some degree a "new" problem and not yet widely perceived by the architectural profession. There are significant design challenges to be met and contributions to be made by architects in helping to cope with these problems.
However some issues still need answering:

- How can architectural design features and approaches contribute to enhanced security with out intruding objectionably on the other qualities of the buildings?
- How can electronic and automated physical security systems be integrated with increasingly complex management and monitoring systems for fire-protection, building environmental control, transportation and communications?
- Who will be responsible for operating these systems and evaluating their performance?

To conclude Dr. Kupperman believes that" terrorism is a condition of modern life. We will have to live with it, so we'd better learn how"[10]

LOOKING TOWARDS THE FUTURE

The future of security may be revealed through the past. As the eighth century practitioners of Feng Shui sought to harmonize their spatial environment we took will need to work towards the same especially in the disorderly times we live in. Modern Warfare has demonstrated how design can counter an enemy's technological and numerical superiority. Residential developments learned from the Second World War and replaced the grid-pattern streets with the organic and ancient curvilinear street to improve safety, security, neighborhood identity and property value. Contemporary research generally supports the notion that space that is widely shared by people, and poorly identified will result in low morale, reduced productivity and greater tolerance to misbehavior.

Security and architecture studies in the 21st century will not forget the lessons from the past. As professionals of the future we make crime difficult by design to respond to rising trends in crime

[10] Article: DESIGN WITH FEAR, Progressive Architecture 1985 by Thomas Vonier AIA

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