ARCHITECTURAL DESIGN AND CRIME PREVENTION

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Crime is a major problem in America today. Applying resources to the crime problem can be viewed as either preventing crime from occurring or by controlling its severity. Because the first approach is so broad and complex, most resources are directed at the second approach. Two environmental design strategies are generally applied to control the amount of crime. The first is target hardening or mechanical intervention, and research in this area focuses upon the attempt to specify performance standards for doors and windows which can be ultimately translated into model building codes. The second major strategy is to design the environment to facilitate natural surveillance of the target and at the same time to influence attitudes of the people in the target's area to report crime. With respect to natural surveillance, research has shown that increased street lighting has a significant impact upon night street crime over comparable control areas which do not receive increased lighting. The relationship between natural surveillance and citizen attitudes has been demonstrated in the New York City Public Housing area. From this work a theory of defensible space has been developed which may have implications for areas other than public housing. Other strategies for impacting crime are also important and include increasing the effectiveness of the criminal justice system and increasing the quality of justice. This work to date emphasizes the design of police, courts and correctional facilities and programs. Currently, the National Institute of Law Enforcement and Criminal Justice, Law Enforcement Assistance Administration, is supporting a major program to extend the research on public housing into four other environments - school, transportation centers, commercial areas and private residences - and to obtain other more basic information about the relation between environment and crime.

Background. Crime is a major problem in this country. Public opinion polls include crime at the top or among the top problems cited by citizens in all parts of the country. It became a major issue in the 1968 presidential election and continues as a major issue today in many local, state and federal elections. The most recent issue of the Uniform Crime Reports (Kelley, 1972) suggests that crime, as a whole, is still climbing. For example, in the latest release of the UCR, crime as a whole during 1973 increased 5% as compared with 1972. (For the prior year (1972-1971), crime as a whole increased 4% below the previous year.) Violent crime was up 4% while property crime was up 5%. More importantly perhaps, is that crime over the last quarter (October-December) of 1973 increased by 15% over the same quarter in 1972. The indication from the previous year that crime was being contained is not being borne out by this recent data.

In 1968, the Omnibus Crime Control and Safe Streets Act created the Law Enforcement Assistance Administration to provide funds to state and local governments to fight crime. Money for action programs as well as money for research and development has been directed to the crime problem. Some of these research and development funds are being used to look at the relationship between the environment and crime in order to determine if there are effective strategies for altering environments in ways to reduce crime. Some specific examples of research and development programs which propose effective strategies will be discussed later.

Generally, the problem of applying resources to the crime problem can be viewed as involving two somewhat different, although complementary approaches (National Institute, 1973). The first is to try to prevent crime from occurring in the first place. This approach is considered by many as the desired, long term solution to the problem. Because crime is a complex social phenomenon, this approach has been difficult to implement. More basic research is needed to determine the underlying social, economic, psychological, ideological and other conditions that lead to crime before effective intervention strategies can be developed to prevent criminal behavior from occurring in the first place. This approach lies outside the scope of this paper and will not be referred to further.

The second approach is to try to control or reduce crime. This is a more reactive posture and assumes that crime exits, and attempts to develop effective strategies to deal with it. There are two basic strategies that apply here. The first is to develop means to make crime more difficult. This strategy is sometimes called target hardening or mechanical intervention. It generally results in altering the target environment in such a way that it takes more time for a criminal to commit a crime. The second strategy is to design the environment around a target to permit a natural surveillance of the target by people in the area of the target while at the same time, to effect attitudinal changes in these people to induce them to take action against crime. This approach increases the probability that a criminal will be detected and apprehended. Thus, both target hardening and natural surveillance can be viewed as a means of increasing the risk to a criminal of being apprehended, and therefore, of reducing the likelihood of a crime being committed. Some significant efforts here will be discussed.

In addition to the above strategies of making crime more risky, there are approaches to the crime problem which have a less direct impact upon the crime rate but still are important for environmental design. These include improving the effectiveness of the criminal justice system and improving the quality of justice. Both approaches are assumed by society to be goals which are important in their own right. For example, improving the effectiveness of the criminal justice system might include altering the design of courtrooms to facilitate the judicial process, while improving the quality of justice might include changing the design of prisoner living quarters to make them more

comfortable and pleasant. These approaches, also, will be considered in their impact upon environmental design later.

Making Crime More Difficult. As indicated, this strategy is to put barriers or impediments in the way of the criminal. This increases the time to commit a crime, and thereby, increases the risk to the criminal.

Some obvious and effective work being undertaken here is in the area of developing performance standards for doors and windows, the primary points of entry of burglars. (Burglary, next to larceny, is the most frequently committed index crime (Kelley, 1972).) The National Bureau of Standard's Law Enforcement Standards Laboratory, over the last couple of years has developed voluntary standards for doors (primary, those commonly used for private residences and small businesses) and are in the process of completing the development of standards for windows (Law Enforcement Standards, 1973). The general approach here is to develop performance standards which leaves it up to the door or window designer to achieve these standards in any fashion they choose. Four levels of performance have been defined for doors and include I. Minimum Level; II. Low-Medium Level: III. Medium-High Level, and IV. High Level. Table 1 illustrates these levels and the corresponding attacks the levels represent defense against. Note that there is no attempt to try to prevent penetration by a skilled criminal. This is assumed to be economically infeasible for the average situation. The targets of the skilled criminal (banks, jewelry stores and the like) can only be defended against by the adoptation of standards beyond the means of the ordinary citizen. In other words, if you have something of extraordinary value to a skilled criminal, you will have to undertake extraordinary means to protect it. Target hardening can only be expected to raise the threshhold of crime, not to eliminate it.

The results of this research will, of course, be reflected in the development or modification of building codes. More specifically, the results of work on standards for doors and windows will be used to update the current National Institute of Law Enforcement and Criminal Justice's Minimum Building Security Guidelines (National Institute, 1971).

In addition to this work, NILECJ has sponsored the development of a Catalogue of Security Equipment and a Directory of Security Resources, both to be completed this year by the Law Enforcement Standards Laboratory.

Increasing Surveillance and Citizen Cooperation. With respect to surveillance, the work of Jane Jacobs (1961) can be said to lead the way here. As early as 1961 in her book, "The Death and Life of Great American Cities," she observed that city planners and urban designers were effecting the design of streets and other public areas in ways that made them less safe from crime. The designs of these areas were such as to reduce "casual" citizen surveillance of these areas.

TABLE 1*
UNSKILLED AND SEMISKILLED
BURGLARY ATTACK METHODS

Category \ Class Level	I Minimum Level (Low Unskilled)	II Low-Medium Level (High Unskilled)	III Medium-High Level (Low Semiskilled)	IV High Level (High Semiskilled)
Bodily Force	Ramming I Kicking I Pushing I	Ramming II Kicking II	Ramming III	Ramming IV
Bolt Attack	Loiding I Breaking I Prying I	Loiding II-IV Breaking II Prying II	Breaking III Prying III	Breaking IV Spreading
Lock Attack	Smashing I Popping	Smashing II Pulling II	Smashing III Pulling III Picking III Wrenching III	Smashing IV Pulling IV Picking IV Wrenching IV
Disassembly		Removal II & III		Removal IV
Inside Unlocking	Arm/Bk. Light I-IV		Reaching Device III	Reaching Device IV

* Law Enforcement Standards Program, Interim Performance Standards for Physical Security of Door Assemblies and Components, NILECJ Standard, October 1973 (Draft)

Since then, several research studies have been undertaken to test the assumption that surveillance is a factor in affecting the crime problem.

A major effort has been undertaken by Kansas City, Missouri and by the University of Michigan to assess the impact of street lighting upon crime (University of Michigan, 1974). The results of this study are still being analyzed but the tentative results to date support the generally accepted notion that increased street lighting does reduce night time street crime by significant amounts (for example, street robberies by 31% more than corresponding control areas). When residential blocks alone are considered, the reduction is 44%. Assaults were reduced 37% over control areas For property crimes, larceny was reduced about 11% over the control area, but auto theft increased dramatically, approximately 43% over the control area. In general, for all night street crime, there was a reduction of 11%. The data also suggest that some of the crime is displaced to side streets adjoining the streets receiving the increased lighting.

A study in Jacksonville, Florida, (Harold Lewis Malt, 1974) reached similar conclusions about lighting and also suggested that other factors in streets (use of shrubbery, location of parking spaces, etc.) influence crime rates.

The most notable research in this area has probably been that of Oscar Newman (1972, 1973). His work, previously in New York City public housing environments, led to the formulation of his theory of defensible space. His goal was to identify and develop architectural design changes that would enhance these residential environments and cause citizens' awareness and concern for common territories to increase. Thus, Newman's theory embraces both physical and psychological elements. His major hypotheses are the following. (Refer to Table 2.)

A. The capability of the physical environment to define perceived zones of territorial influence.

   Through exterior site planning and interior building design, it is possible to subdivide a housing project so that its occupants and outsiders perceive various portions of it as being under the control of particular groups of occupants. These physical subdivisions are defined by access paths, activity areas and entries into subunits, and encourage occupants to adopt attitudes and exhibit behaviors which provide a policing function.

B. The capacity of physical design to provide surveillance opportunities for residents and their agents.

   This hypothesis is that grounds and internal semi-public areas of public housing areas can be designed to facilitate the visual and auditory monitoring of activities taking place

TABLE 2
CATALOG OF DEFENSIBLE SPACE HYPOTHESES

A. The Capacity of the Physical Environment to Define Perceived Zones of Territorial Influence.

B. The Capacity of Physical Design to Provide Surveillance Opportunities for Residents and their Agents.

C. The Influence of Geographical Justaposition with "Safe Zones" on the Security of Adjacent Areas.

D. The Capacity of Design to Influence the Perception of a Project's Uniqueness, Isolation, and Stigma.

in them. It is based upon the fact that much crime in public housing areas is in these spaces, that is, lobbies, halls, elevators and fire stairs, that the design of access paths, building locations, lobbies, stairs and corridors, window locations, etc. can be such as to ensure that all public and semi-public places come under continual and natural surveillance, and that will reduce crime.

C. The influence of geographical juxtaposition with "safe zones" on the security of adjacent areas.

This hypothesis assumes that the safety of residential areas is influenced by positioning public areas and entries of buildings so that they face onto areas which are considered safe, that is, on main arterial streets, areas patrolled heavily by police or other similar type areas.

D. The capacity of design to influence the perception of a project's uniqueness, isolation and stigma.

This hypothesis assumes that public housing is often characterized by a particular similarity or distinctiveness, and by locating such groups of building into an existing urban fabric, which singles out these buildings, leads to more crime if the distinctiveness is a negative one.

These hypotheses, and numerous examples which tend to support the hypotheses are covered at length in Newman's Architectural Design for Crime Prevention and his book Defensible Space. Currently, Newman, under a very recent Institute grant, is translating this material into a set of design directives for achieving defensible space. This work is to provide a handbook for producing new and secure housing. Three illustrative building types will be developed using the design directives. This work is scheduled for completion in early 1975.

In addition to this work of Newman, other research is underway along related lines. A project is now underway in Hartford, Connecticut which builds upon the work of Newman and also looks at private residences and streets. In addition to attempting to identify environmental factors which would impact crime, this project will attempt to get at the problem of the spatial displacement of crime. Spatial displacement of crime can be illustrated by the following. If you harden or otherwise design a facility to make it less susceptible to crime, the crime merely moves in space to a more accessible target. To date the evidence suggests that displacement holds for the skilled criminal, but is not so likely for the unskilled, younger offender. Preliminary data (Urban Systems, 1973) indicate that the juvenile offender may range up to about a half-mile from his home, but no further. The Hartford project cited above will seek to test this displacement phenomenon more carefully and systematically. If the displacement phenomenon is as indicated, then it has implications for the scale to which environmental design changes should be directed.

That is, if you harden a single building or a few buildings in a small geographical area (one or two blocks), then the crime is merely going to be displaced to the adjoining buildings which are not hardened.

The Hartford project is also attempting to develop a methodology to identify environmental design problems and includes a physical site survey, a victimization survey, offender interviews and police data.

Increasing the Effectiveness of the Criminal Justice System. Environmental design can have many direct impacts upon increasing the effectiveness of the three traditional areas of the criminal justice system - that is, police, courts and corrections. In the former, the design of police stations and police vehicles are obvious areas of concern. Some work has been done on the human factor implications for the design of the police vehicle and in the design of other police facilities. The National Clearinghouse for Criminal Justice Planning and Architecture (1974) has developed guidelines for police facility planning related to various operational requirements (based upon a 22-city survey).

The National Clearinghouse for Criminal Justice Planning and Architecture (1971) has done extensive research on the design of prisons and these results are being promulgated widely. The general trend toward community-based corrections, however, suggests that the environmental design of half-way houses and other similar facilities will need to be addressed more thoroughly in the near future.

The design of courtrooms has been the focus of Michael Wong and his associates (Wong, 1973). The design process has been looked at in ways to facilitate the judicial function, that is, managing and conducting trials in a more efficient and humane way. These results are based upon specific design recommendations for Manhattan's Foley Square court complex. However, a study requirement was to analyze problems and develop solutions which would have applications for other metropolitan areas as well.

Improving the Quality of Justice. The approach here is to make environmental design changes which would improve the quality of justice. The most obvious example is in the design or redesign of facilities for the more humane treatment of prisoners. This also includes the design of guidelines to impact the security of witnesses at trials and other individuals involved in criminal justice, such as victims, complainants, etc. At present, these considerations are often peripheral to design to improve criminal justice effectiveness as described in the previous section of this paper. More research is needed here.

Future Research. The National Institute of Law Enforcement and Criminal Justice has a major program currently underway dealing with community crime prevention. Much of the work under this program has direct relevance to environmental design. For example, just within the last month a $2,000,000 contract has been awarded to look at four areas for the development of environmental design guidelines - schools,

commercial areas, transportation centers and private homes. Demonstration projects, research and evaluation, technical assistance and information dissemination activities are included in this 24 month program. Should the effort be successful, it is anticipated that an additional 24-month effort would be supported. The Crime Prevention Through Environmental Design program attempts to build upon the results of the earlier Newman research. It does this primarily by extending the scope of the work to the four environments named above. But, considerable emphasis will be in obtaining more basic data about the various relationships between design factors and crime in order to extend our knowledge, as well as our designs, of the four target areas.

Summary and Conclusions. This paper has looked at research to affect crime by means of environmental design. Several approaches were identified to impact crime and for each of these approaches, research to develop environmental design strategies within each approach was identified. Emphasis was upon strategies involving target hardening and environmental design to facilitate natural surveillance and citizen cooperation. Environmental design is seen as both a physical and psychological means to reduce crime. Some current and future research efforts by the National Institute of Law Enforcement and Criminal Justice were described. A focus upon new research is to determine the applicability of recently developed concepts such as defensible space to new environments while at the same time to better understand the various factors involved in crime within these environments.

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