ATLAS SAFETY & SECURITY DESIGN, INC.

Defensible Space: An Architectural Retrospective

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While "Form follows function" is a familiar tenet of 20th century architecture, originally expressed by the Bauhaus School of Design and popularized in America by Frank Lloyd Wright, most architecture has focused on form rather than function. It is as if the structure itself, harmony with the site, and integrity of the materials have become the function. Less emphasis has been placed on the activities taking place inside the building.

> *"The intrinsic significance of our craft lies in the philosophical fact that we deal in nothing. We create emptiness through which certain physical bodies are to move - we shall designate these physical bodies for convenience as humans. By emptiness I mean what is commonly known as rooms. Thus it is only the crass layman who thinks that we put up stone walls. We do nothing of the kind, we put up emptiness.*" (Rand, The Fountainhead, 1943)

Architecture by definition, is built for people. Architecture is the enclosure in which people live their lives. The behavior of people within the architecture demonstrates the dynamically moving social fabric of the human race. By considering an individual's behavior in their space it allows for the validation of the design. (Heimsath, 1977) Any building must meet specific functional criteria, and from the function the design

evolves. A building must permit efficient job performance, meet the needs of the user, and protect the user from safety hazards and criminal acts that affect the production of goods and service.

> *"An architect uses steel, glass, concrete, produced by others, But the materials remain just so much steel, glass, and concrete until he touches them. What he does with them is individual product and his individual property*." (Rand, 1943)

Architects worry about the fortress mentality of security professionals, while security professionals are concerned about the architects' failure to include security elements in the design of the building from the ground up. The conflict is not over whether to include security equipment in the building design. rather, the conflict lies between a building's openness, on one hand, and control of access to it, on the other hand.

Securing a building that was not originally planned to be secure is expensive. Architects have to sacrifice much more of a building's openness in retrofitting for security than they would if the facility had been designed for security from the outset. Protection , personnel, and operating expenses are greater than they need to be because of a lack of forethought during the design of the facility. This condition is particularly evident in many of today's buildings, where modern design and materials can result in facilities that are especially vulnerable.

Oscar Newman's (Newman, 1972) concept of "defensible space" focused on the vulnerability of urban housing architecture to crime because of their poor design and lack of territorial responsibility by residents. Research has shown that criminals do not move about randomly through their environment looking for a target, (Repetto, 1974) but use a spatial search process to try to find victims or targets that match their perceptual generalizations. When a match occurs, crime is likely to occur. The process of deciding to commit a crime can be conceived of as using cues from the environment to help select a path toward a victim or target.

The Brantingham's (1991) have written that crime can be curbed by altering the conditions that provide the opportunities for criminal behavior. Great financial resources would be required to change existing buildings and neighborhoods to reduce environmental crime cues. Once a building enters the construction phase, it is generally too expensive to make changes to the structural system. When a building is occupied, it is even more difficult and expensive to make security improvements, The result is that security measures are forced to adapt to the existing physical conditions, which limit their effectiveness. Many modern buildings, for example, use glass and free-flowing interiors extensively. Even though the world ha become less secure and more prone to crime and terrorism, many buildings have become less fortress-like and more open, without any security features to compensate for this vulnerability. For a building to be made truly secure, security considerations must be in the architectural drawings

from the very beginning.

Architects often view security requirements as obtrusive and distracting from the appearance of their buildings. While security detection devices can be made and installed unobtrusively, many security requirements such as desks and consoles need to keep a high profile - this creates the security zoning needed to prevent the opportunity for access by unwanted parties.

If security has not been designed into the building from the start, security must rely on technological systems such as closed-circuit television (CCTV). When CCTV is installed without a compatible physical design, the CCTV observers cannot distinguish ordinary behavior from deviant behavior and thus respond to the appropriate emergency quickly.

In facilities that were not planned with security in mind, receptionists and electronic entrance controls are frequently overwhelmed by the number and variety of people coming and going. Often the design of parking lots, entrances, and lobbies did not anticipate the control requirements. One example is open service counters, such as cashier, pharmacy, and payroll counters. Whether alarmed or not, these generally are not designed to be secure. They practically encourage robbery attempts.

Inappropriate parking and pedestrian traffic patterns invite extraneous persons and congestion in critical or hazardous areas such as loading docks; mechanical areas; and inventory, production, and assembly areas, thereby encouraging accidents, theft, vandalism, and assault. Electronic window and door detectors installed after the fact may be compromised through plasterboard walls or suspended ceilings.

In today's climate of security litigation, the consequences of failing to secure a building are great to the owner and the designer of the building. Security litigation is increasing at a tremendous pace. Lighting, parking lots, landscaping, security hardware, and visibility are being viewed closely by attorneys and expert witnesses. These people are all too willing to tell a jury how the owner and architect failed to consider the foreseeability of crime in the building design.

Architects and designers can make the greatest contribution to meeting a project's security objectives because architects make the basic design decisions about circulation, access, building materials, fenestration, and many other features that can support or thwart overall security aims.

For the building process to come to life, there are three key roles of players. The first is the architect, who designs the building for the owner. The owner commissions the building, and typically manages it after the building is finished. The third role is that of regulatory government, local, state, and federal.The architect, operating for the

owner, works within the constraints of regulatory government as expressed through deed restrictions, zoning laws, health, fire, and building codes. Thus, the built environment is a reflection of the needs of the owner, as defined by the owner; a product of the regulatory guidelines of the government agencies protecting health and safety; and the experience and insight of the architect, as demonstrated through the design. If change is to occur within the building process, it is going to occur within the existing roles of these three partners.

The architect's job is to use the security requirements identified by the security professional into programmatic directives. The design team uses the program to start the design of the building. The architectural program is one of the most important phases in the whole building process. The program establishes the scope of work, the parameters, and initial budgeting for the building.
Owners will ask that architects design what is economically sound, socially useful, and aesthetically pleasing. Regulatory agencies will control, through a series of prohibitions or incentives, the physical health and safety aspects of a building. Architects will design within the accepted standards of care of the profession, and the aspirations of the community as a whole, as the architectural professionals perceive them. If positive change is going to occur in the building process, it could occur by a dramatic change in society's needs, or a shift in economics that will make certain building forms more or less feasible (for example, the change in U.S. Federal architecture after the Oklahoma City bombing and subsequent GSA Security Design Standards). These shifts would influence owners in establishing their needs. Change can occur by legislation (i.e, CPTED Codes, Ordinance, Resolutions), or by influencing the architects who are active, on-going participants in building after building.

The architect can play a vital role in designing effective natural access control, surveillance, and territorial reinforcement strategies. Designing for security poses three challenges for architects:

- **Determining requirements.** Security needs must be determined early in the project's programming and problem definition stage. The design team should analyze the designated purpose of how the space or building will be used. The designated purpose will be clear when designers examine the cultural , legal, and physical definitions of what the prescribed, desired, and acceptable behaviors are that space. The space can then be designed to support desired behaviors and the intended function of the space. The design team should inquire about existing policies and practices, so that this information will be integrated in the programming process.

- **Knowing the technology.** Rapid substantial advances in the technology of security systems make keeping up - to - date a challenge. Many projects today, even routine ones, may involve security system specialists as part of the team. As with other areas of

specialization, architects must have a basic understanding a security principles. Design professionals must be in a position to evaluate and implement technical security specialists and security equipment manufacturers.

•**Understanding architectural implications.** Designs must integrate the complicated and sometimes conflicting goals of security and life-safety issues as well as other project variables and requirements. Space, function, and people must be planned to support the security objectives of detection, delay, and response to unwanted or criminal situations.

How architects design is a product of the theory they use in design and the procedure society has established for producing buildings. Since theory can be changed or influenced without major disruption, the issue of procedure is addressed first. (Heimsath, 1977) The current design procedure is well illustrated by the standard contract document produced by The American Institute of Architects (AIA). While the document is basically sound, it exemplifies (Heimsath,1977, P.26) two major weaknesses in the design process: the lack of both a *programming phase* and a feedback or *Post Occupancy Evaluation (POE) phase*. The omission of these phases in turn points to the physical bias of architecture, giving little direct attention to the needs of inhabitants as dynamic beings moving in time and space.

So it is evident that the stage to first bring up security needs is in the programming phase of design. It is the client's responsibility to define precisely the potential threats to **people, information ,and property** and to determine the level and cost of the protection that will be provided. Many owners, clients, and developers may only have a casual awareness of security and of what they need to protect. They may not have the knowledge and experience to develop adequate strategies or security plans.

The program is like the menu to a restaurant, defining what you are going to serve, who are you going to serve, and how much are you going to charge. The architectural program is the menu of the building. This is the point to make a difference with security. From this point forward security considerations will always require changes in drawing, and additional time and money. That is why programming for security is important. Security needs must be determined early. Defining what is needed usually involves a combination of common sense and methodical investigation. The client may need a security specialist to develop the protection requirement of this phase. Many architect help clients locate a qualified security specialist for their building type and security needs.

Programming is presented in AIA documents as the responsibility of the client, " The Owner shall provide full information, including a complete program, regarding their requirements for the project." The architect is required to confirm such a program in

preparing schematic designs, but the word "confirm" hardly suggests a major role in developing a data base for alternatives that might include not building at all. Additional programming steps may be undertaken by the architect, if requested specifically by the owner. Payment for such services is listed as an additional service, under Article 1.3. Architects typically receive little compensation for the programming phase that produces the behavioral data. Often architects give the program (need assessment document) away free or at little cost, as a loss leader to get the job. Once the commission is secure, the programming phase is often done hastily and with minimal effort since it is not a direct billable expense. If the architectural program and behavioral data is not introduced in the beginning of the job, it cannot be effective in directing design, and for the basic and irrevocable decisions that will be made subsequently without considering behavior of the intended users. (Heimsath, 1977)

Secondly, there is no feedback phase in the current design process. The scientific method uses a methodology to test hypothesis by examining the cause-and-effect relationship. The decision making and response stages of architecture are lacking a feedback process to understand the cause and effect of the design decisions on the building users and the surrounding community. There is no required feedback process built into the architectural design process. There is not even a widespread understanding by the architectural community as to the important role feedback or POE's might play. For example, design award juries are not instructed to question the users of the buildings. Design awards are given when the buildings are just opened or first occupied. There are even un-built design awards to the buildings that never were.

Often, there is a seven year cutoff date, so that buildings older than seven years are not even eligible for many awards. Architects interviewed for new jobs are asked to make verbal and visual presentations. When architects are interviewed by a panel for a potential job, it often occurs in one sitting, ostensibly to compare their abilities. Seldom are the buildings, which architects design, considered in terms of their social success.The architect's past projects are demonstrated with slide shows or powerpoint computer presentations to showoff their physical characteristics. The buildings are seldom visited to find out how well they actually work.

The post occupancy evaluation has been a recommended practice of architects for years. In fact, back in 1986 Cooper, Marcus and Sarkissian stated that "architects usually are forced to fall back on their own experience and their perceptions of the future tenants' needs. There is, however, an alternative...post occupancy evaluations provide useful information about what works and what fails from the residents' perspectives' (Cooper Marcus and Sarkissan, 1986;1).

Building clients and design professionals are not the only ones concerned about security during the design process. Many jurisdictions requires security review by the police as part of the building-permit approval process, much the same as with fire

safety requirements. Inspectors evaluate the plans for obvious spots where assaults, mugging's, break-ins, and other crimes of opportunity may exist. Many jurisdictions have security ordinances that require certain lighting levels and secure door and window designs and hardware.

If security is treated as one of the many design requirements, then the implementation and costs for such measures will be no more a burden to the project owners than fire safety features or landscaping requirements. The basic premise of crime prevention through environmental design (CPTED) is that proper design and effective use of the built environment can lead to a reduction in the incidence and fear and to increase the quality of life. The environmental design approach to security recognizes the space's designated or redesignated use - which defines a solution compatible with that use. Good security design enhances the effective use of the space at the same time prevents crime.

The emphasis in CPTED design falls on the design and use of space, a practice that deviates from the traditional target-hardening approach to crime prevention. Traditional target hardening focuses predominantly on denying access to a crime target through physical or artificial barrier techniques such as locks, alarms, fences, and gates. The traditional approach tends to overlook opportunities for natural access control and surveillance. Sometimes the natural and normal uses of the environment can accomplish the effects of mechanical hardening and surveillance. These conclusions evolved from the many applications of CPTED and Defensible Space from its inception.

Defensible Space and CPTED were evolving at the same time in the early 1970's. Many social scientists/criminologists/ and architects criticized the Defensible Space findings and research in public housing work for being architecturally deterministic. Oscar Newsman (Newsman, 1996, p. 3) responded to his criticism by stating:

> "From reviewing the literature that has emerged from the CPTED movement - a spin off of Defensible Space - I am surprise by how poorly the Defensible Space concept is understood an dhow often it is misused. I had always thought of my ideas as comparatively simple and down to earth. And, when explaining them, I have tried to avoid mystery and mumbo jumbo. Yet a whole cult has sprung up around these misgivings, with its own pseudo-language, misbegotten concepts, and rituals. After reading the literature and examining the projects that have been built in the name of CPTED and Defensible Space, I am troubled by my failure to communicate my ideas clearly.

The architectural community has never been properly educated or trained in the ways of Defensible Space design or CPTED practices. There are no schools of architecture in

the United States that have CPTED as part of their curriculum. There is no requirements for Defensible Space and CPTED to be part of the architectural licensing process. Yet, every architect must learn and know fire safety regulations and evacuation paths of travel.

The standardization of fire prevention, as a very close cousin of crime prevention, is based upon the belief (theory) and practice and principal, that the people's safety is the highest law. The building and life safety codes have as its fundamental goals the preservation of human life and property from fire and other life safety hazards related to buildings and building construction through enlightened and proper design; construction and inspection of all buildings and structure; uniformity in building regulations; the development of better methods of construction based on rational analysis; and the establishment of a sound basis for the growth of a defined geographic area.

The National Fire Protection Association's Life Safety Code had its origin by an assigned committee in 1913. The committee devoted its attention to the study of notable fires involving loss of life an din analyzing the causes of this loss of life. This work led to the preparation of standards for the construction and arrangement of exit facilities for factories, schools and other building types. In 1921, the Committee was enlarged to include representation of certain interested groups not previously participating, and work was started on further development and integration of life safety features in all classes of occupancy. The first edition of the Building Exits Code was published by the National Fire Protection Association in 1927. However, the Code was not in suitable form for adoption into law, as it had been drafted as a reference document containing many advisory provisions useful to designers of buildings, but not appropriate for legal use. The Committee re edited the Code and results were incorporated into the 1956 edition and subsequently refined and updated over the years. (NFPA, Life Safety Code, 1988. P.101x)

Imagine the changes in our built environment if a crime prevention committee had been developed in the early 1900's to prevent and reduce the loss of life resulting from crime in our built environment! How would the architecture have changed if a Security Code had been established to rationally and logically determine the minimum requirements for safe and crime resistant buildings. What if specific requirements and provisions had been established for security and crime prevention through standards and codes, and adopted as law and national standards of care?

WHY IS FIRE PREVENTION THAT DIFFERENT THAN CRIME PREVENTION ?

Fire prevention and life-safety codes developed a systematic and scientific process to establish measurable and predictable criteria for buildings to prevent fires, structural failures, and other life threatening events. It has been Proposed by Saville (1998) a

documented crime prevention risk assessment process be conducted during the development of new urban designs. A crime prevention risk assessment, in conjunction with implementable crime prevention recommendations, represents the most systematic and comprehensive method devised to date for determining the potential problems that an urban development site might experience. (Saville, 1998).

The history of urban planning, architecture, and environmental criminology has recorded many instances where significant criminal problems arose when architectural development proceeded without a comprehensive crime/security risk assessment. The CPTED risk assessment has been developed to respond to the need for a more targeted approach: that crime reduction must proceed from as good an understanding as possible the actual crimes being committed at that point in time in that area; and that targeted crime reduction seeks to break down the idea of crime into a more clear picture of exactly what crimes, against what targets, where, and by whom.

Risk assessments have been developed by combining scientific field research and analytical methods with the practical experience of crime prevention practitioners and the perceptions of community members. There are four minimum criteria for conducting crime risk assessments. These criteria represent a combination of quantitative (statistical) and qualitative (perception) approaches. Specific research techniques for each risk assessment criteria are determined by factors at each site such as the size, scope of development, and timing of a project, and what problems currently exist in the surrounding area. (Saville, 1998)

This implementation of a CPTED risk assessment process provides a guideline or standard of care for developers, CPTED practitioners, architects and planners, CPTED consultants, or police officers.
CPTED can be applied *before* or *after* a site is developed. It can also be applied on the basis of scale: *small, medium, or large* projects. The appropriate CPTED risk assessment process allows the CPTED practitioner to determine which CPTED tactics need to be applied. Based on the scale of the development or building the amounts of data and analysis will be required in order to make sound well balanced decisions.

Many social sociologists, while acknowledging the problem of a dysfunctional community, cannot see the connection of social disorder to architecture. On a small scale, architecture may influence a particular building or particular rooms on a particular group of people. But, when architecture is conceived as building process affecting the culture of a society, then the decision to locate low income minorities in high densities without significant social programs is of critical influence on subsequent behavior. For example, the placement and size of Cabrini Green Housing was determined as a design decision, not as a social decision. The owner and architect set the social organization in motion by deciding on the building, the location, the

density , and the configuration. (Heimsath, 1977. P.14)

The subsequent housing disaster's at Cabrini Green in Chicago, and Pruitt Igoo in St. Louis, and dozens of other projects around the United States finally awoke the sleeping bureaucratic giant, U.S. Housing Urban Development. Current HOPE VI projects are using low-rise townhouse plans that incorporate Defensible Space/CPTED strategies and New Urbanism/Traditional Neighborhood Design principles. The primary emphasis, should be on revitalizing the residents of public housing, not just the residences of public housing (HOPE VI Developments, Issue 35, April 1999. P. 3). Current public housing developments needs to be meeting the goals of providing a clean, functional and safe living environment, but also providing the resident an opportunity for self-sufficiency. Besides good architecture, other critical needs for the residents to succeed are a "triad" of job training (so people are employable), day care (so people are available to attend both job training and their new jobs), and a foundation of education, especially adolescents.

CONCLUSION

CPTED and Defensible Space Design has generally been practiced without the benefit of a systematic process or assessment as dictated in the scientific method. Most practitioners are in the law enforcement and have gained their CPTED expertise by attending one or several training's. The police officer CPTED practitioner is seldom given the time, resources, or expertise to conduct pre and post evaluations of crime hot spots requiring improvements. The universal solution has been to conduct a "quick and dirty" study of a troubled neighborhood or housing project requiring attention from crimes, illegal drugs, or gang related activity. The typical practitioner develops recommendations without the benefit of gathering all of the relevant information; without the benefit of power or authority to implement recommendations; without the power to make design or management decisions that perpetuate the problems; nor the ability or resources to evaluate or measure the success or failure of the recommendations. Each new site or crime project invoked reinventing the process again without and standard code or protocol.

The CPTED practitioner often goes to a potential crime site with their CPTED toolbox of "experience". Like a magician empowered to pull a rabbit from a hat, the CPTED practitioner must often pull the divergent forces of architecture, operational/ management practices, governmental bureaucracy, and vested interests together in a collaborative process. Each new situation requires creative problem solving. But, there is no standard of care. There is no minimum standards of what the process should be or the criteria for evaluation. With the exception of several cities with CPTED codes/ordinances/resolutions there is virtually no common guidelines for the practitioners to follow, other than their own experience or resources.

CPTED has an established process to evaluate the linkages between the built environment and criminal behavior, yet, CPTED as a "environmental design science" has failed because of the lack of systematic testing and evaluation of projects, the lack of a systematic risk assessment process, and the lack of standardization. The CPTED practitioner often reinvents the process for each project. CPTED practitioners must start to read new books and articles on environmental research, and how to do it. This presentation critically examined the evolution of architecture, science, and CPTED. The utilization of the scientific method and using a risk assessment model is what the future and long term goals should be for the successful implementation of CPTED into the built environment. It is time for the future of CPTED to "*GET SMART*":

- **S**pecific goals of what crimes are to be reduced and experience outcome
- **M**easurable and replicable goals and results in the form of POE's
- **A**chievable goals and results by clearly defined action steps
- **R**ealistic goals that are well grounded and have a scientific basis
- **T**imed goals for a logical sequence, and ordering of action steps.

The application of CPTED in the architecture can never entirely eliminate crime because it does not attack the root causes. Architectural security design may only move crime to other, more vulnerable areas. It remains easier to remodel a building than to create jobs for teenagers. Design can provide a conducive environment for legitimate human law abiding activity, but it can not create such control if the social fabric of the community is fragmented. The inclusion of security and life safety functions into the architecture adds greatly to the potential for a safer and more cost-effective work and living environment.

With the increasing threat to society from workplace violence, terrorism, and street crime, there is a clear and present need for moving CPTED from untested deterministic strategies, to a process the stands up to the rigors of the scientific method, and has predictable and measurable results. The field of fire prevention and life safety has successfully moved beyond the fear and panic, to understanding the science of what causes fires and how the architecture can prevent them. By understanding and improving the scientific method of CPTED we can prevent the fear and opportunity for most crime and improve the quality of life.

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