BEHAVIOURAL BASED DESIGN

By: Tom McKay

I recently had an opportunity to sit down with a PhD candidate working on his thesis on Crime Prevention Through Environmental Design (CPTED) in Ontario. CPTED (pronounced sep-ted) believes that the proper design can lead to a reduction in the fear and incidence of a crime and an improvement in the quality of life. CPTED concepts and principles have served me well for over a decade as a CPTED specialist with Peel Regional Police. Yet by the conclusion of the interview, I was left somewhat unsettled by the fact that my answer to the oft repeated question "what do you see as the challenges facing CPTED?" had not substantially changed over the past twelve years.

For the record, my answer to this question was "CPTED needed to develop". It was time, I had said, to put some "flesh on its bones". My concern however was based on the realization that after waiting twelve years, the development of what was now a forty-two year old concept was in my mind long overdue and for the first time I began to wonder if change would ever come. I subsequently began thinking about how I would develop and expand CPTED beyond its three main concepts – natural surveillance, access control and territorial reinforcement. I also took some tentative steps towards fine tuning that long and cumbersome name. After all, I have seen first hand how that name can sometimes get in the way such as the time when I spent two weeks dealing with a traffic related problem at an elementary school only to have the Manager of Traffic dismiss the effort as he could not relate it to an approach with "crime prevention" in its name.

This proved to be a cathartic process when I crystallized my twelve years of crime prevention experience and emerging trains of thought into a new and evolutionary concept that I call Behavioural Based Design. Behavioural based design is a strategic design approach that looks to understand the predictable ways that people interact with a given environment when developing the most appropriate physical settings for inducing desired behaviour. Inherent to this approach is a "socio-design" hierarchy that clearly establishes the primacy of behaviour as a determinant of design.

While not limited to crime prevention applications, the design methodology is inherently proactive as the process is predisposed to engineering environments that are in harmony with behaviour while culling negative influences. Put another way, it attempts to unravel behavioural "DNA" then replicate the required elements needed to clone desired behaviours. This effectively results in an adaptable approach that can respond to behavioural change. Such is not the case using a CPTED approach.

Exposing CPTED's Limitations

CPTED's inability to adapt to behavioural change

Potentially, one of CPTED's greatest limitations is its inability to adapt to behavioural change. Graffiti can be used to illustrate this point. Prior to the development of the graffiti subculture, it was uncommon for visible walls to attract a graffiti vandal. This all changed with the development of the hip-hop culture in the 1960's. The desire for fame resulted in kids first

approaching those walls to leave their mark. Later an additional motivation developed whereby these same kids began to view blank walls as something that was ugly and in need of graffiti. It was the change in organic behaviour that drove the kids to the walls! Put another way, the walls never changed!

This has two major lessons for CPTED. The first is that human behaviour is not static, it is forever evolving. The second is that human behaviour drives physical design which in turn can reinforce desired human behaviour. Any lesser perspective may fail to adapt to change or result in limited success. This has major implications given a society where the respect for property and property rights is losing its traditional influence as we will see later.

Criminals who don't act according to the CPTED playbook

Another limitation is the presumptive way that it treats offenders regardless of motivation or type. CPTED, through its three main design concepts, effectively makes a presumption that an abundance of natural surveillance, access control and territorial reinforcement will reduce the fear and incidence of crime. What CPTED fails to take into account is that not all offenders play by its rules. For instance, the graffiti vandals we spoke of earlier seek out highly visible locations. This flies in the face of conventional CPTED wisdom and natural surveillance in particular.

Natural surveillance is a design strategy that is directed at keeping intruders under observation. Inherent to this strategy is a presumption that criminals prefer to operate in the shadows where they are less likely to be seen. How then can CPTED be expected to effectively deal with crime and criminals who fall outside its logic? The answer is simple. It cannot.

CPTED practitioners in the absence of an understanding of the graffiti subculture have no way of properly diagnosing the problem. The tools are simply not there. That is why I have often observed budding CPTED practitioners potentially aggravate a graffiti problem by calling for the addition of light. What the CPTED practitioner fails to understand is that lighting these walls simply makes them more attractive in the eyes of the graffiti artists. Graffiti vandals are motivated by fame. Fame is achieved when a vandal's graffiti is displayed to the greatest number of people. This can be achieved in a couple ways including lighting up the walls. By understanding this motivation, it is easy to avoid aggravating the problem but the fact that it falls outside of the CPTED paradigm can make it difficult for CPTED practitioners to see. The same holds true for other crimes. Bank robbery is a well documented example.

In 1985 the Bank Administration Institute of Rolling Meadows, Illinois undertook an extensive six month review of how the interior design of banks affects the number of times that a bank may be robbed and the manner of the particular robberies. The study involved a thorough literature review, an "archival" analysis of 204 bank robberies in the city of Seattle over a four and a half year period and an extensive analysis of 54 victimized banking institutions that accounted for 111 of the robberies.

The study found that the interior elements of the bank do not seem to always be involved in the same way as different "species" of bank robbers use the settings in different ways. Significant amongst their findings were a number of conclusions that once were contrary to natural surveillance. These included:

- banks that are brightly lit and that have large window areas seem to be more prone to "takeover" robberies as the high visibility also aids the offender in casing the interior, and

- armed robbers prefer banks with highly visible teller lines and obscured views from bank officers while unarmed robbers seem deterred by these conditions.

Of equal significance were findings that flew in the face of natural access control. Natural access control is a design strategy directed at decreasing crime opportunity and increasing the perception of risk in offenders. Examples of findings that contradicted natural access control included:

- banks with single entry/exit doors are robbed more frequently by gunmen, while banks with two or more doors are preferentially selected by surreptitious note passers, and

- counter heights, depth and partition heights have a different deterrent effect on different types of robbers.

These findings are significant because they once again demonstrate that some observations were contrary to conventional CPTED wisdom and published material on security thinking. This has a potential major implication for unsuspecting CPTED practitioners who could inadvertently attract armed bandits to a bank by applying CPTED techniques!

These findings are also significant because they are yet further examples of the limitations of the one size fits all approach to environmental design. Namely different offenders do indeed react differently to their physical surroundings. I found support for this conclusion from a couple of sources including in the readings of Drs. Martin Gill and Ronald Clarke.

Gill stated that "Criminoligists have tended to theorise about crime causation on a general level, when in practice offences and offenders differ so markedly that offence-specific explanations and profiles need to evolve".[1]

Clarke stated the "opportunity-reducing measures appropriate to certain offenses may not be appropriate to others. This means crime prevention through environmental design must be tailored to the specific problems occurring in particular settings".[2]

Identifying CPTED's weaknesses

A lack of true analysis

CPTED's major limitations belie an even larger problem--the pretence of analysis. CPTED "analysis", for all intents and purposes is nothing more than basic information gathering. Timothy Crowe, author of the definitive Crime Prevention Through Environmental Design text book, essentially promotes this perspective in his text by stating that "any attempts to skip the basics in favour of more complex forms of information gathering or analysis often obscures the picture."[3]. This helps to explain the lack of emphasis that analysis is given by CPTED

practitioners which is in fact so cursory in nature that the term doesn't even appear in the index of Crowe's book.

The superficial way in which analysis is treated is not, however, common to other established approaches. Problem Oriented Policing for instance, a widely accepted concept developed by Herman Goldstein, Professor Emeritus at the University of Wisconsin, clearly places the emphasis on analysis over all other components of his SARA (scanning, analysis, response and assessment) model. In a February 1997 interview with Law Enforcement News, Goldstein stated "I would hope that we could see much more rigor in the analysis, that we don't jump to conclusions as to how to deal with the problem differently, but instead invest much more in thinking through very critically what we're doing and what might be done differently, getting much more comfortable with the collection and use of relevant data and its analysis". CPTED practitioners would benefit from adopting this perspective for crimes that involve more than the most basic behaviours.

CPTED's offender oriented bias

Another fundamental weakness is CPTED's offender-oriented bias. This is particularly true of natural surveillance which routinely speaks to opening up sightlines (a prerequisite for keeping intruders under observation) while offering virtually no insight into why "normal" people, particularly people with no stake in the property, should look. Without the answer to this question, natural surveillance is little more than a random possibility.

"Territor-reality"?

The latter part of the 20th century witnessed an unprecedented drop in the respect for property and by extension property rights as witnessed by the proliferation of graffiti, gangs and the skateboarding phenomena. This effectively challenges the concept of territoriality as a generation of graffiti vandals, gang members and skateboarders effectively view public and private property as an extension of their own. I have personally witnessed the confusion that this has caused as an informal canvass of teenagers reveals a disturbing number who are unaware that unauthorized graffiti is against the law.

Compounding this problem is a general deterioration of the public realm brought about by an ongoing decline in maintenance. Sources of this decline include cash strapped cities cutting back on garbage and litter collection; graffiti being tolerated, weeds being allowed to grow out of control thanks to the banning of herbicides; and even a trend towards naturalization which pushes the limits of property standard tolerances while compromising natural surveillance.

Collectively these influences serve to undermine the concept of territoriality which when coupled with its somewhat "nebulous" nature to begin with (see "What Should Be CPTED's Next Step? in the December 1998 issue of Security Management magazine) shakes the very foundation upon that CPTED was built on.

The marginal role of form

The importance of aesthetics or form is well known to marketers, retailers and interior designers. It can be used to create an ambience that is appropriate to almost any setting. It has also brought about significant drops in vandalism and major cost savings as was demonstrated by an aesthetically pleasing makeover of a community centre in the City of Mississauga (see "Security Centered Around Self-Respect" in the June 1998 issue of Security Management magazine). It is therefore disappointing that form plays such a marginal role in CPTED. This comment notwithstanding, it is unlikely that form will ever have the emphasis it deserves due to CPTED's function oriented bias and the general lack of concepts and strategies that are related to form.

CPTED as a seminal work

CPTED developed in a remarkably naïve time given that it predated most of the significant work done in the field of environmental criminology. Today, the modern criminologist has a much better understanding as to how criminals move about in urban space and why they select the targets they do. The relatively recent development of geographic profiling demonstrates the potential of a scientifically based practice developed from this knowledge. Classic CPTED theory fails to reflect these advances. Behavioural based design is best suited to this task.

BBD 101

The essence of Behavioural Based Design can be captured by the following six propositions:

1. *The probability of a particular behaviour manifesting itself is a function of its known rate of recurrence in a comparable and conducive setting.*

2. *The reasons for recurring behaviour are instructive and must be clearly understood.*

3. *All behaviours may be considered desired, supportive or unwanted depending on the setting.*

4. *Setting characteristics can be linked to desired and unwanted behaviours.*

5. *Desired behaviours may be induced by replicating the setting characteristics that are associated with the behaviour.*

6. *Unwanted behaviours may be discouraged through the manipulation or removal of associated setting characteristics.*

For practical reasons behavioural based design is only interested in desired or unwanted behaviours. Supportive behaviours, such as the need to use a washroom or family change room, are treated as necessary but ambivalent. It should be noted that these classifications avoid the CPTED pitfall of grouping people into normal and abnormal categories. The reason for this is that a behaviourally based design theory recognizes that people's behaviour is not so cleanly disposed such that:

- all so called "normal" users of the environment -- people who you want to be there (according to CPTED's definition)—always act in a positive way, and

- all so called "abnormal" users – those you do not want to be in that space—always act in a negative way such as when loiterers actually do patronize a store.

This routinely accounts for scenarios where a single individual can alternate between being a normal and abnormal user such as when a skateboarder on plaza property decides to get off his skateboard and patronize a convenience store, only to get back on his skateboard and skateboard where prohibited on his way to a skateboard park. Recognizing that this is not unusual behaviour given people's natural tendency to regularly bend or break the rules, behavioural based designers simply focus on whether the behaviour is desired or not without making a judgment about the perceived nature of the source.

Support for this perspective can be inferred from Clarke who concludes that "the image of the predator from outside, which underlies the original defensible space thesis (and Crowe's guidelines), ignores the fact that much crime is committed by residents and other legitimate users of the space."4 By focusing on behaviour, as opposed to user types, behavioural based designers can overcome the CPTED bias towards abnormal users.

The Probability of Behaviour -- Proposition No. 1

The quintessential notion that behaviour can be predicted is consistent with lessons learned from environmental criminology. This may ultimately result in the incidence of behaviour being quantified with the aid of a yet to be developed mathematical equation. Until that day arrives and behavioural based design achieves its ultimate potential and moves into the realm of a genuine science, behavioural based designers should be content to use their knowledge, instincts, and observations to determine whether the probability of a behaviour is high, low or intermediate.

Behavioural Based Profiling -- Propositions 2 through 6

The process by which desired or unwanted behaviours are identified, analyzed and understood can be characterized as behavioural based profiling. This process begins in a CPTED like manner by relying on observations and interviews with stakeholders to gather information about how any given property and/or enterprise is intended to work. From there, core behaviours that the stakeholders see as relevant to the success or failure of what they are trying to accomplish are identified and behaviours are broken down into desired, supportive or unwanted categories.

Once this has been established, a clear understanding as to why the desired or unwanted behaviour or activity happens or is expected in a particular setting is sought. At its most basic level, behaviour can be instinctive or almost herd-like as people simply react to their environment such as when they follow a desire line that takes the shortest distance between two points.

At a more complex level, behaviour may be setting specific or effectively conditioned. This was Barker's focus (1968) when he defined what he called "behaviour settings". It was also was the focus of Gump (1971), LeCompe (1972), and Wicker (1972) who tried to "identify the sets of behaviour that occur in specific settings."5 Their work collectively addresses why we act differently at a library as compared to a baseball stadium for example.

Behaviour may also be the result of a subculture. Case in point: skateboard parks.
 "Why do so many skate board parks fail? Because well thought-out research into what skateboarding means to the youths, what it involves and what it represents to them and their peers is rarely done. Skateboarding has always been about the use/misuse of public property. That's where it gets its radical sense of appeal to the kids. That's what gives them the "rush" when they skate down a ramp at city hall for instance. Rather than use such information to guide our environmental approaches to the problem, we simply design areas with no connection to the nature of the behaviour itself. The result? 10 to12 year olds using the parks while the 15 to 24 year old cohort continues to scour the city for better places to skate."6

Behavioural based profiling can also provide insight into inducing a desired behaviour. This brings us back to an earlier point, how to capture witness potential. Behavioural Based Designers realize that people are motivated by self-interest and in this regard will most often be oblivious to things that don't directly involve themselves or fail to catch their attention and, as a consequence, draw on their natural curiosity. Behavioural based designers should therefore be interested in any research that documents what is likely to be seen and remembered.

Early research by Carr and Schissler found similiarities between what was watched (eye fixations) and what was remembered as people traveled along a highway outside of Boston using a head-mounted devices to track where a person looked, what the points of visual fixation were and how the person turned his or her head. This research was reinforced by Appleyard in 1969 in a study entitled "Why Buildings Are Known". Appleyard came up with several major characteristics that included buildings of unusual size, distinctive contours, complexity, distinctive landscaping or signage, visibility from major intersections, and single use buildings such as police stations.7 This type of research is needed to assist the behavioural based designer in unlocking the environmental characteristics needed so that we might successfully induce desired behaviour.

As the science of behavioural based design grows and evolves, the Behavioural Based Designer's task can be expected to ease as more research is done on behaviour and more is known about the environments that support it. This has already been done to a sufficient degree on the marketing side of the food industry and to a lesser extent on the the security side of the convenience store industry.

Applications from the field

Over the years, I have frequently encountered problems that were not adequately addressed or anticipated by CPTED yet would benefit from CPTED solutions. Many of these problems are recurring in nature and therefore are predictable. Casual socialization is a common example of a behaviour that can become problematic when the physical environment is used in unconventional and undesired ways such as when congregation and socialization points develop in a rogue manner.

Rogue Congregating and Socialization Points

Rogue congregating and socialization points typically develop in predictable yet unconventional settings where the socialization needs of a particular group are mimicked or supported and these settings are preferred over their more conventional alternatives. This generally occurs with teenagers in search of their own space. I have also seen this develop with disenfranchised adults, such as males with drinking problems, who often choose to meet outside their residence for the purpose of getting drunk.

Teenage Oriented Settings

It has been my experience that rogue congregating and socialization points for teenagers routinely develop in readily accessed/high traffic locations that tend to mimic conventional social settings and/or support colonization by teenagers. These typically include after hours play ground equipment, groupings of tables, and impromptu seating areas such as the u-shaped, armour stone drainage culvert featured in the photo.

In the armour stone example, the sofa-like arrangement of the stones became such a popular hang out for kids that one nearby resident attempted to address the associated loitering, noise and disorderly activities by erecting a 6 foot privacy fence inside the 4 foot chain link fence that already sat on her property. When this didn't help, the resident called her city Councilor who arranged for Police and transportation and works personnel to meet on site. This resulted in a decision to preclude access to the inner edge of the armour stone by moving the fence that protected the culvert by a distance of 3 feet.

Had the potential for rogue congregating and socialization behaviour been considered at the time of development, this problem could have been eliminated. Recognition of this problem would have been much more likely if considered from a behavioural based perspective as it is extremely doubtful that CPTED would have identified what turned out to be the critical need for such a relatively subtle design change.

Adult Oriented Settings

While much less common, it has been my experience that adult oriented, rogue congregating and socialization points typically develop in poorly observed, largely vacant/little used areas close to beer or liquor stores. With the benefit of this knowledge and a behavioural based perspective, I was able to locate a rogue congregation and socialization point that was critical to the resolution of a stubborn problem, the source of which had failed to be reveal itself during an earlier CPTED audit.

The problem involved drunks loitering at a well designed plaza. It defied an obvious CPTED solution as the source of the drunks was unknown and there was a lack of CPTED factors in need of correction on the property itself. The solution was found by investigating an adjacent property located at the rear of the plaza where I recognized the potential for a rogue congregating and socialization point.

The property in question was a vacant field featuring a gentle swale. The swale sat in a corner of the property that was not readily visible from the back of the plaza due to a change in elevation between the two properties. Sightlines into the corner of the property were further compromised by low lying branches and tall field grasses that had been allowed to grow around a felled branch undoubtedly placed in front of the swale for the purpose of providing additional cover. So effective was this cover that seven people, five of whom were sitting on milk crates -- the other two passed out, remained invisible until the original CPTED auditor and myself traveled half way across the field.

Once there we discovered a group of fifty year old men with liquor bottles in hand. Discarded in the bushes behind the area were hundreds upon hundreds of empty bottles. Our presence ultimately caused most of the men to leave the area. We watched the men as they headed toward the plaza, walking through the east side of the plaza on their way home. Following their path, it became obvious that this was used as a desire line by the drunks as evidenced by now apparent signs of dried urination and the occasional discarded bottle or cap.

As obvious as all of this had now become, it certainly was not apparent prior to the discovery of the rogue congregating and socialization point as other possible scenarios were contemplated. The key to unlocking the problem was locating the rogue congregating and socialization point that I had expected from a behavioural based perspective.

Concluding thoughts

During the past year, I have shared many of my ideas with advanced CPTED practitioners and, to date, have been very encouraged by the largely favourable and eager response. CPTED practitioners are not a foolish lot. They are bright, articulate people who routinely question everything as per their teachings. It should therefore come as no surprise that the instinct for change would come from CPTED people themselves. We have already seen evidence of this from Greg Saville (founding Chair of the International CPTED Association) and Gerry Cleveland who developed "Second Generation CPTED", a response, in part, to "an emerging belief that some of the basic assumptions of Crime Prevention Through Environmental Design have been only partly correct."[8] Sherry Carter (past Chair of the International CPTED Association) and her husband Stan have also followed suit with the development of what they call "Community CPTED".

While I believe that the instinct for change is correct, I also recognize that a consensus will never be achieved within the existing CPTED framework. There are simply too many practitioners out there and too much politics.

This provides yet another compelling reason for a distinct and evolutionary concept. I believe that Behavioural Based Design, while presently little more than the germ of an idea, is capable of attracting attention and rallying significant support from conventional and unconventional sources of support such as psychologists and sociologists who are notable by their absences at CPTED conferences.

I believe that if CPTED practitioners seriously challenge their concept in comparison with the potential of a behavioural based approach, they will begin to see their concept in the way that a

typical Cuban might see their automobile if exposed to a newer model. Given time, there will hopefully be a paradigm shift towards behavioural based design as more people recognize CPTED's inherent limitations and flaws not the least of which is shoddy analysis and its inability to adapt to change. Until that day, I invite anyone interested in joining this dialogue to contact me directly so that we can direct our energies into the full development of what I believe will be a significant, evolutionary and science friendly approach.

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5. Patterns in Crime, MacMillan Publishing Co., New York, 1984 Pg. 353
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8. Integrating the Planning Process and Second-Generation CPTED, The CPTED Journal, Vol. 2, Issue 1